



THE U.S. ASIA-PACIFIC REBALANCE, NATIONAL SECURITY AND CLIMATE CHANGE

A CLIMATE AND SECURITY CORRELATIONS SERIES

Edited by Caitlin E. Werrell and Francesco Femia

With a foreword by
Admiral Samuel J. Locklear III, U.S. Navy (Ret), former U.S. Pacific Commander

November 2015

THE CENTER FOR
CLIMATE AND
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Cover Photo:

Members of the Papua New Guinea Defense Force prepare to embark aboard the Royal Australian Navy landing ship, as a part of of the Pacific Partnership 2010, an annual U.S. Pacific Fleet humanitarian and civic assistance endeavors to strengthen regional partnerships. August 2010.

US NAVY/EDDIE HARRISON

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REPORT OVERVIEW

The United States is in the early stages of what it characterizes as an "Asia-Pacific rebalance". Essentially, this means that on a very broad strategic scale, the United States intends to reorient its foreign policy and national security posture to the Asia-Pacific region, which is host to burgeoning populations, growing economies, strategic choke-points like the South China Sea, and a number of rising powers. But the region is also one of the most vulnerable to the effects of climate change, with a growing coastal population, rising seas, numerous critical waterways fed by glaciers, threatened island states, increased drying, and projections of severe water insecurity in the near future.

In this context, the effects of climate change are likely to both shape, and be shaped by, the U.S. role in the Asia-Pacific. If the U.S. is to engage constructively in the region - building and broadening alliances, helping advance regional security and prosperity in the face of potentially catastrophic change, and advancing U.S. national security interests - it will have to seriously consider how climate change affects the region, how the U.S. can help advance the climate resilience of the region's diverse nations, and how the U.S. will adapt strategically to a changed security environment.

This publication will explore how climate change intersects with the various drivers of insecurity in the Asia-Pacific, and what that means for U.S. foreign and/or national security policy in the context of the Asia-Pacific rebalance.

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FOREWORD

Admiral Samuel J. Locklear III

U.S. Navy (ret), Former U.S. Pacific Commander

Today we find ourselves in a period of unprecedented global change – change that is offering many new opportunities, but also introducing significant emerging challenges to the global security environment. Foremost among these emerging challenges are the long-term security implications of climate change, particularly in the vast and vulnerable Asia-Pacific region, where the nexus of humanity and the effects of climate change are expected to be most profound. These changes are prompting U.S. policy-makers, decision-makers and military planners to better understand how climate changes are altering the Asia-Pacific security environment and to reevaluate and adjust our long-term “whole of government” strategic priorities and approaches in the region.

For more than seven decades the United States, in coordination with our allies and partners, effectively shaped and oversaw the post-World War II Asia-Pacific security environment. Through an intricate network of alliances and strategic partnerships, backed by strong diplomacy, productive economic policy and a robust and largely uncontested forward military posture, the United States created and maintained a security environment very favorable to U.S. interest, an environment that history will agree dealt effectively with the region’s traditional security challenges and underpinned the significant social, political and economic successes that can be observed today in many parts of the Asia-Pacific region.

As we look forward, it is without question in our best interest, and in the best interest of our friends and allies, to see this success continue. However, success will require planning and preparation for the full range of the Asia-Pacific’s traditional and non-traditional security challenges, which must include what may prove to be the Asia-Pacific’s greatest long-term challenge, climate change.

To this end, the United States Rebalance to the Asia-Pacific Strategy is an important reaffirmation that the United States is and will remain a Pacific power. It provides a valuable “whole of

government” framework to analyze, explore and integrate the implications of climate change into our Asia-Pacific policies and to drive our long-term diplomatic, economic and security investments in the region. As we seek to rebalance and reinvigorate our historic alliances, build new strategic and economic partnerships, and effectively posture our military in the Asia-Pacific for the 21st century, we must address the potentially catastrophic security implications of climate change in the Asia-Pacific and their likely impact on U.S. interest in the region.

Fortunately, within the context of the ongoing Rebalance to the Asia-Pacific, thoughtful consideration is now being given to the long-term security implications of climate changes – but much more is needed. The articles in this excellent report, *The U.S. Asia-Pacific Rebalance, National Security and Climate Change*, sponsored by the Center for Climate and Security, provide valuable insights and recommendations from a number of highly respected authors from academia, centers for analysis and notable think tanks who continue to add depth and understanding to the vitally important security aspects of climate change. I highly recommend them to all those who seek a clearer understanding of climate change and the opportunities and challenges that lie ahead in the Asia-Pacific.

STRATEGIES, POLICIES AND PRACTICES

A CLIMATE-SECURITY PLAN FOR THE ASIA-PACIFIC REBALANCE: LESSONS FROM THE MARSHALL PLAN

Francesco Femia and Caitlin E. Werrell

The United States is a Pacific nation, and a Pacific power. Stability in the Pacific is therefore inherently linked to U.S. security and foreign policy interests. Despite high-profile international security crises in Europe and the Middle East, including Russia’s revanchist actions in eastern Ukraine and the rise of ISIS, the United States remains committed to placing a greater strategic emphasis on the Asia-Pacific region, closing down some military bases in Europe, redeploying soldiers to bases in Australia and the Philippines, moving combat ships to Singapore, bolstering commitments to allied and partner nations in the region, and placing the region front and center in its strategic documents.¹²³⁴ As stated in the U.S. Department of Defense (DoD) 2012 Defense Strategic Guidance note, “while the U.S. military will continue to contribute to security globally, we will of necessity re-balance toward the Asia-Pacific region.”⁵ This commitment was reaffirmed in the DoD’s 2014 Quadrennial Defense Review, with the centerpiece of the rebalance being described by the DoD as “efforts to modernize and enhance our security alliances with Australia, Japan, the ROK, the Philippines, and Thailand.”

However, in order for this strategic shift to translate into lasting influence, the United States needs a comprehensive diplomatic, defense and development agenda for building the region’s resilience to key emerging threats – including climate change.

The Pacific Rebalance in Historical Context

In very broad strokes, the reasons for this so-called “Pacific Rebalance” are not necessarily far removed from the reasons for the United States’ Eurocentric posture after the Second World War.⁶ In both cases, strategic significance is key. U.S. strategy after the Second World War was designed

to ensure the defense of Western Europe against internal war, economic disaster and a rising Soviet Union, with Berlin serving as the strategic convergence point of the superpower competition. Over six decades later, a number of factors have contributed to a new strategic focus on the Asia-Pacific: a rising China; rapid economic and population growth in the broader Asia-Pacific; the proliferation of nuclear weapons and materials (five of the world's nuclear powers are in the Indo-Asia-Pacific); increased economic activity and political tensions in the strategic convergence point of the South China Sea;⁷ military buildups (the area boasts seven out of ten of the world's largest standing militaries); and the opening of previously impassable sea lanes by a melting Arctic.⁸ The difference today is that the United States does not quite have the Asia-Pacific equivalent of a Marshall Plan to set this new posture on a stable, resilient and prosperous footing.

Cooperation and Competition with China

In the absence of robust U.S. engagement and investments that help address the core needs of Asia-Pacific nations, including those needs that are challenged by a changing climate, nations in the region may ultimately find it more practical to accept the reality of a regionally dominant China, and the economic and political consequences of that reality. Indeed, many nations in the region, in the face of an uncertain level of U.S. engagement, have been slowly reorienting their foreign and domestic policies to accommodate an increasingly powerful Beijing,⁹ while others, such as Cambodia, seem to be hedging their bets.¹⁰ While a number of nations in the region are engaged in disputes with China over contested areas of the South China Sea, China's influence is increasing on both the economic and military front.¹¹ China remains the largest trading partner for Southeast Asian nations, and is increasing its military force significantly in relation to other countries in its neighborhood, including through the deployment of a "blue-water navy" that has ventured as far from home as the Straits of Hormuz.¹⁷² China has also begun development of a regional Free Trade Zone, which could compete with U.S.-led objectives in the regional trade arena.¹⁸³

In this context, the United States will need to develop more expansive approaches to relations with China if it wishes to maintain and enhance its regional influence, and support the interests of its allies and partners in the Asia-Pacific.¹⁹⁴ More robustly addressing the region's climate challenges offers one such opportunity.

The Climate Reality in the Asia-Pacific

The U.S. enjoys a strong relationship with key Asia-Pacific allies, such as Japan, South Korea, Australia, India and the Philippines. But there are a host of other nations, from Indonesia to East Timor to Vietnam, that have traditionally had a more difficult relationship with Washington. These nations also happen to be very vulnerable to natural disasters. According to UNISDR: "The

Asia-Pacific region is the most disaster-prone area of the world and it is also the most seriously affected one. Almost 2 million people were killed in disasters between 1970 and 2011, representing 75 percent of all disaster fatalities globally. The most frequent hazards in the region are hydro-meteorological, which also affect the most people.”¹⁵



Children play in flood waters after torrential rains in Kampung Melayu, South Jakarta, Indonesia, January 17, 2013. VOICE OF AMERICA/KATE LAMB

Climate change will significantly multiply this vulnerability to natural disasters in the Asia-Pacific.¹⁶ Nations of the region have already recognized the gravity of the threat. For example, the Council for Security Cooperation in the Asia Pacific has identified climate change as an ever-present existential threat to its members.¹⁷ The American Security Project’s “Global Security and Defense Index for Climate Change” shows that Asia-Pacific nations overwhelmingly perceive climate change as a threat to their national security.¹⁸ For the United States, this has been confirmed by a series of intelligence assessments and studies,^{19 20 21} and war games conducted by the Department of Defense, which demonstrate that South and Southeast Asia face a number of security challenges driven by climate change in the next few decades, including food shortages, water crises, catastrophic flooding, greater frequency and intensity of hydro-meteorological disasters, population displacement, and increased public health issues.²²

If the U.S. is serious about successfully pursuing the broad range of U.S. security and economic interests in the region, it will need to find a way to build and maintain a much broader and more resilient coalition of Asia-Pacific allies. The U.S. must offer key countries in the region the opportunities they need to both grow their economies, and combat significant transnational threats to their well-being. In this context, taking a page out of George C. Marshall's book might make a lot of sense.

Lessons from the Marshall Plan

In 1949, the United States made a decision that its national security depended on the maintenance of a broad coalition of strong European allies to contain, and compete with, a rising Soviet Union. The Marshall Plan, a \$13 billion package of development assistance tied explicitly to diplomatic, development and defense priorities (the “3 Ds”), was the first and most important step in that process – designed, as it was, to maintain a Europe stable and secure enough to resist Soviet aggression, both covert and otherwise.²³

The robust nature of the Marshall Plan, which effectively combined all 3 Ds of U.S. foreign policy – connecting economic and development assistance to Europe with diplomatic and security objectives – quickly elevated Western Europe from devastated to developed, and has since been recognized as one of the single most important elements of that grand strategy. The Marshall Plan helped to lay the foundations for a vital European Union, a strong European defense structure – the North Atlantic Treaty Organization (NATO) – and the economic, political and military defense against the spread of Soviet-style communism. It stands to reason that such a broadly-successful strategy and plan be mined for ideas on how to flesh out a new U.S. strategy in the Asia-Pacific – a region that is very vulnerable to climate change threats, and grappling with the risks and benefits of a rising China.

In this context the U.S. requires the modern equivalent of the Marshall Plan for the region to assist nations in addressing climate-related threats, and to complement its current military and economic engagement in the area. In short, the U.S. needs a *Climate-Security Plan for the Asia-Pacific*.

Why a Climate-Security Plan?

Addressing climate change risks in the Asia-Pacific will help the United States bolster its influence in the region through enhancing stability, broadening and deepening alliances and trust, and protecting U.S. economic, trade and commercial interests.

Enhancing stability:

A core purpose of the U.S. presence in the Asia-Pacific is to provide stability. Without climate investments in the region, the likelihood of instability, conflict and disaster may increase, with great cost to the region and the United States.²⁴ Fragile governments and economies, already strained, will experience further stresses. Some island states, for example, could literally cease to exist – a possibility that may soon become irreversible fact.²⁵ If significant and sustained climate adaptation investments and programs are not forthcoming, this picture will only be the tip of the proverbial iceberg. A 2009 security review by Australia's Defense Force (ADF) stated that rising sea levels may lead to increased refugee flows from vulnerable Pacific islands, and subsequent disputes over land and scarce food resources.²⁶ The ADF concluded this might compel them to heighten their naval presence north of the country. With such dire security projections, significant investments in climate-sensitive disaster prevention and response systems, financing to increase government capacity to provide essential services, and more robust military-military and civilian-military programs for building climate resilience will be vital for preventing disaster, keeping nations out of conflicts and disputes, and avoiding the necessity of high-cost emergency and military solutions. Such investments will have the added benefit of alleviating the burden on U.S. military operations and readiness, and freeing up those resources to conduct other critical missions.

Broadening and deepening alliances and trust:

Recent commitments to climate resilience through USAID's Pacific-American Climate Fund, the ADAPT Asia-Pacific program, and robust and swift support from the U.S. military and partner civilian agencies after significant natural disasters, such as Typhoon Haiyan in the Philippines, have been welcome. However, the Asia Development Bank notes that the region requires about \$40 billion annually until 2050 in order to "neutralize" the effects of climate change.²⁷ In this context, U.S. contributions to climate resilience in the region have been very small relative to the threat. This could be problematic as the U.S. seeks to broaden its partnerships in the region beyond its traditional allies, including with strategically-significant and extremely climate-vulnerable countries²⁸ such as Vietnam²⁹ and Indonesia.³⁰ While the broader diplomatic repercussions of this gap between need for climate resilience and U.S. support remain unclear, growing frustration with the United States over its inability to marshal additional investments in climate resilience has been expressed among the Pacific Island states.³¹ In concert with the advancement of other regional trade and investment initiatives, meeting the region's climate needs could provide the opportunity for economic and political stability; build trust and goodwill towards the United States; make it easier for the U.S. military and civilian agencies to cooperate with nations on security, humanitarian and disaster relief missions; and serve as a non-threatening way of competing with China for regional influence.³²

Protecting U.S. economic, commercial and trade interests in the region:

The resilience of the Asia-Pacific as a whole is also good for U.S. commercial interests in the region. As Admiral Samuel J. Locklear III, former U.S. Pacific Commander, noted, the Indo-Asia-Pacific boasts “two of the three largest economies of the world...the busiest sea lanes in the world with over 8 trillion dollars of two-way trade with half the world’s container cargo and 70 percent of shipborne energy passing through the Pacific every day.”³³ The U.S. State Department estimates that in 2012, U.S. foreign direct investment (FDI) in this fast-growing region amounted to \$622 billion, “reflecting a 35 percent increase since the beginning of the Obama Administration.”³⁴ The effects of climate change, including sea level rise that will significantly impact large coastal cities and ports, rainfall variability that can damage critical supply chains, and the potentially destabilizing effect of migrating fish stocks in the volatile South China Sea,³⁵ could jeopardize a significant portion of these U.S. investments. In this context, investments in climate adaptation for vulnerable countries would help increase the capacity of critical economic partners in the area to cope with extreme weather events, and other climate impacts. For example, a quarter of the world’s “sliders,” an essential component of hard disk drives, are manufactured in one Thai plant in Bang Pa-In.³⁶ In 2010, that plant was inundated by floods that were the result of wild rainfall variability – increasingly attributed to climate change.³⁷ Regional investments in climate-proofed flood and water management systems, among other adaptation projects, could serve to avoid these supply chain disruptions, and thus strengthen the stability of U.S. economic interests in the region.

What Would a Climate-Security Plan Look Like?

The good news is that the foundation for a Climate-Security Plan has already been laid. The bad news is that it will require political will to build on this foundation to meaningfully address the scale of the threat. Nonetheless, there are existing programs, funds, strategies and structures that can form a strong basis for such a plan, and that collectively address the “3 Ds” in the U.S. foreign policy toolkit: defense, diplomacy and development. With the right scale of investment, and with coordination across these three traditionally-distinct silos, a Climate-Security Plan which includes, but is not limited to, the components listed below could play a significant role in helping to address the region’s vulnerabilities.

Defense:

The U.S. military can play a fundamental role in helping maintain stability in climate-vulnerable nations in the Asia-Pacific region, through both military-military (mil-mil) and civilian-military (civ-mil) engagement designed to bolster preparedness for climate-related threats and response capacity. Indeed, some of this engagement is already happening, including mil-mil cooperation on disaster risk reduction (DRR) with key partner nations such as Malaysia;³⁸ large-scale joint exercises such as Pacific Angel;³⁹ regional security dialogues on climate change and security

at forums such as Shangri-La⁴⁰ and the ASEAN Defense Ministers Meeting,⁴¹ and military-led diplomacy through the Pacific Outreach Directorate of US Pacific Command (USPACOM),⁴² which has been very receptive to regional concerns over climate change. However, a much more robust program is needed.

The U.S. can do much to build climate resilience in the region by simply expanding mil-mil and civ-mil engagement programs led by USPACOM. This includes ensuring that the U.S. Department of Defense broadens its strategic guidance to USPACOM to allow for the integration of climate change risks into its deliberate and contingency planning processes, strategic analyses, joint exercises and cooperative security programs. This would give USPACOM the space to coordinate with its counterparts in the diplomatic and development agencies to address climate change as a strategic security risk in its Area of Responsibility (AOR), a vast expanse ranging from India to the easternmost Pacific island. Such coordination should emphasize the stabilizing and “conflict avoidance” benefits of climate change adaptation, water security and disaster risk reduction efforts in key countries. The U.S. Department of Defense can also expand the scale and scope of USPACOM’s resources to address climate security risks through mechanisms such as the Combatant Commander Initiative Fund – funds that could go a long way towards limiting the number and size of costly humanitarian and disaster relief (HADR) missions in the future.⁴³ The U.S. could also encourage more robust participation from the Joint Staff on addressing the strategic security implications of climate change in the region, which could significantly elevate U.S. attention to the issue, and prevent climate concerns from being limited to the “low politics” doldrums of environmental hazards. Lastly, the U.S. could explore minor reforms to security assistance to the region, scrutinizing outdated programs, and elevating programs designed to mitigate the security risks of a changing climate, among other emerging transnational security risks.

Aftermath of Typhoon Ondoy (Ketsana), Philippines 2009. AusAID



Diplomacy:

Diplomatic efforts to enhance cooperation with allied, partner and prospective partner nations on addressing climate-related threats will be critical for the success of any such plan. Again, the U.S. will not be starting from scratch. In 2013, the U.S. supported the Majuro Declaration at the Pacific Islands Forum,⁴⁴ which called on countries to create a fund to address climate risks in Pacific islands. In 2014, the U.S. concluded a historic deal on climate change with China, which included a major pledge from both countries to reduce their greenhouse gas (GHG) emissions.⁴⁵ However, a much greater emphasis on bi-lateral and multi-lateral partnerships for addressing climate change in the region is needed.

With important U.S. backing, the Asia-Pacific Economic Cooperation (APEC) may have room to expand its mandate beyond energy, and into climate change adaptation⁴⁶. In 2012, the U.S. launched a high-level engagement process in the region that included “coping with climate change, and rising sea levels,”⁴⁷ which can serve as the basis for more robust further engagement on the issue. The U.S.-led Trans-Pacific Partnership, a “regulatory and investment treaty” for the region, can be leveraged to drive strategic investments in climate resilience.⁴⁸ And just as the U.S., in concert with Brunei and Indonesia, launched the \$6 billion “Asia Pacific Comprehensive Partnership for a Sustainable Energy” in 2012,⁴⁹ a similar effort could be launched to support climate change adaptation efforts.

Lastly, more expansive U.S. support for climate-sensitive disaster risk reduction (DRR) in the region – which requires close coordination across the 3Ds – could have important, long-lasting diplomatic benefits that go well beyond the often short-lived diplomatic benefits of successful disaster response efforts.

Development:

Development support, including increases in financing for climate change adaptation projects and building climate-resilient infrastructure, will also be of critical importance – particularly support that addresses potential drivers of instability and conflict. Until now, such financing has been minuscule relative to the threat.⁵⁰ While recent U.S. commitments, such as its pledged \$3 billion to the Green Climate Fund, USAID’s ADAPT Asia-Pacific program,⁵¹ the Pacific-American Climate Fund,⁵² and the Lower Mekong Initiative,⁵³ will help in this regard, it may not be enough – especially given China’s recent announcement of an alternative “South-South” climate fund.⁵⁴

Once again, the foundation for expanding these programs exists. On top of financial channels with long-standing support from the United States across Administrations, such as the Global Environment Facility⁵⁵ and the Climate Investment Funds,⁵⁶ the Green Climate Fund⁵⁷ has the potential to provide a significant amount of climate adaptation support, provided the U.S. is able to make good on its commitments, increase them over time, and direct a significant portion of

the funds to the most strategically important and vulnerable countries in the Asia-Pacific region. The U.S. has also created a five-year Pacific-American Climate Fund,⁵⁸ which can be renewed and expanded upon. There are other less obvious funding mechanisms that can be deployed and enhanced as well. For example, the U.S. could broaden the mandate and scope of the Global Security Contingency Fund,⁵⁹ a unique fund jointly administered by the U.S. Department of Defense and Department of State, to emphasize the commitment of resources for addressing the security implications of climate change in the Asia-Pacific. Entities like the Overseas Private Investment Corporation (OPIC), the Export-Import Bank (Ex-Im Bank) and the Millennium Challenge Corporation (MCC) can also be mobilized for this purpose.

If the U.S. were to lead now with the delivery and expansion of these investments and programs, it could bolster its efforts to remain an indispensable nation in the Asia-Pacific region, and potentially do so in a way that makes a very small dent in the federal budget.⁶⁰ If not, the U.S. stands to either cede that ground to a rising China, or in the absence of China assuming a leadership role, acting as a bystander to growing instability and economic disruption.

An Asia-Pacific Rebalance Needs a Climate-Security Plan

Times have obviously changed since the Marshall Plan was implemented, and there are many ways in which modern investment programs and strategic engagement strategies are different. But the key positive lesson of the Marshall Plan is relevant today. To be successful, national security strategies must be complemented by defense, diplomatic and development support for our current and prospective allies to combat emerging threats. If the United States wants to be successful in the Asia-Pacific, it will need to invest in combating the great threat multiplier in the region – climate change.⁶¹ Indeed, addressing the needs of Asia-Pacific nations that are vulnerable to the effects of climate change may be the U.S. foreign policy imperative of the 21st century – a policy that will shore up and sustain U.S. leadership in both the Asia-Pacific and the world. Failing to play such a leadership role may ultimately result in other nations either assuming that leadership mantle, or being left without the capacity to prevent and respond to instability and conflict. The U.S. has that capacity, if it chooses to seize the opportunity at hand. A Climate-Security Plan for the Asia-Pacific may be the 21st century equivalent of the Marshall Plan for Europe, and U.S. global leadership may depend on it.

Francesco Femia and Caitlin Werrell are Co-Founders and Directors of the Center for Climate and Security.

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WIDENING THE SCOPE TO ASIA: CLIMATE CHANGE AND SECURITY¹

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Due in large part to high population densities along rivers and low-elevation coastal zones, Asian countries have among the highest numbers of people exposed to the impacts of climate-related hazards, and thus at greatest risk of mass death. Floods, droughts, and storms have always tested civilian governments and international humanitarian aid agencies. However, climate change threatens to make the problem worse by increasing the intensity and possibly the frequency of climate-related hazards.²

Increasingly, both national and foreign militaries are called upon to carry out humanitarian assistance operations in the event of major climate shocks. Because of the potentially destabilizing consequences of a changing climate, an emergent discussion about climate change and security has developed in policy circles³ and among academics.⁴ That literature has focused largely on the connections between climate change and conflict, mostly leaving aside other security outcomes of concern such as humanitarian emergencies.

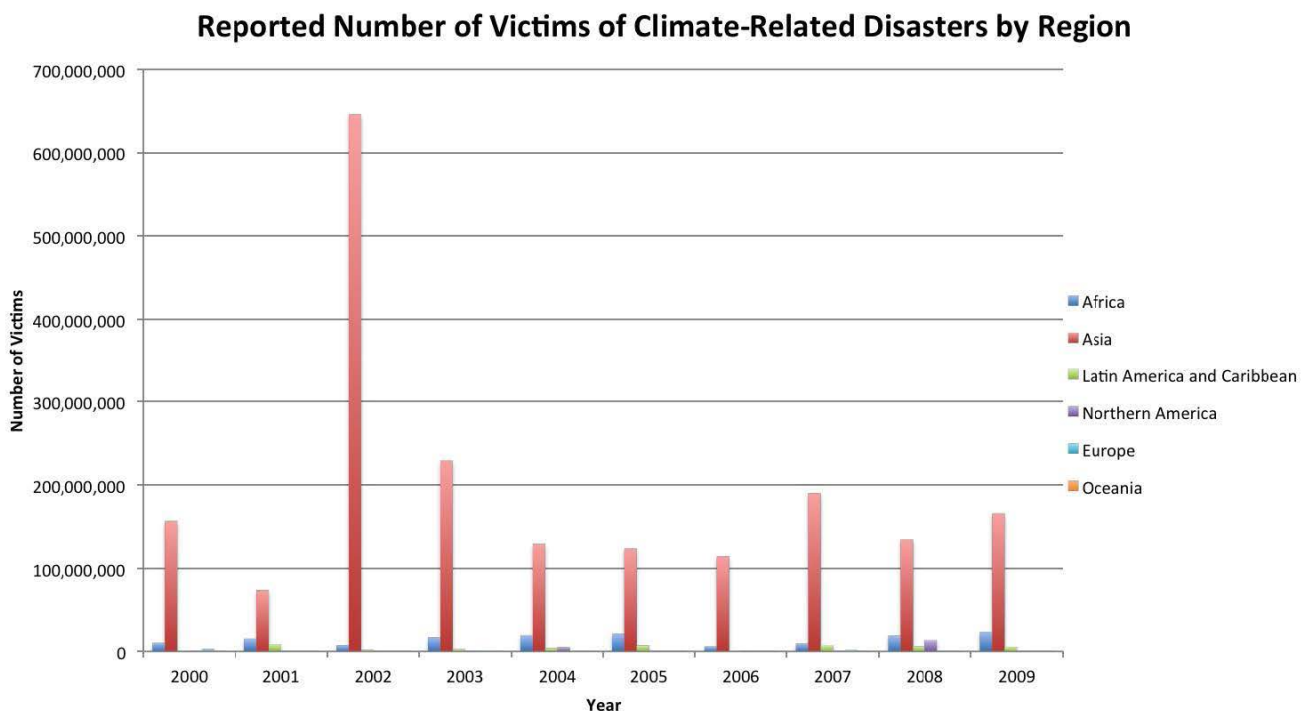
Though experiencing the lion's share of disaster fatalities and affected populations, Asian countries receive a small proportion of disaster assistance from donors such as the United States. At the same time, Asia remains understudied in the climate and security literature, particularly among academics. This chapter explores those dynamics and provides some preliminary thoughts about what that means for the study of, and emergent policy attention to, climate change and security.

Climate-Related Disasters in Asia

Climate-related hazards – such as floods, wildfires, storms, droughts, and hurricanes – endanger the lives of millions around the world. In some situations, resilient communities and capable governments are able to prevent exposure to a natural hazard from becoming a *disaster*, a situation where large impacts on the local population occur. However, in other instances, an absence of investments in risk reduction and preparedness make communities vulnerable to large-scale loss of life, humanitarian emergencies from the dislocation of local populations, and emergent food insecurity and disease risks. In such situations, civilian agencies are often overwhelmed.

Asia is particularly vulnerable to the effects of disasters because of its high population and the concentration of large numbers in mega-cities, defined as cities with a population in excess of ten million people. Sixty percent of the world's population lives in Asia. By one count, as many as 17 of 26 megacities are located in Asia.⁵ As a consequence, of the 2.22 billion people killed and affected by climate-related disasters worldwide from 2001 to 2010,⁶ 89% were located in Southeast, Southern and Eastern Asia (see Figure 1).⁷ These numbers are estimates derived from the EM-DAT International Disaster Database, the main dataset that compiles information and statistics on disasters.

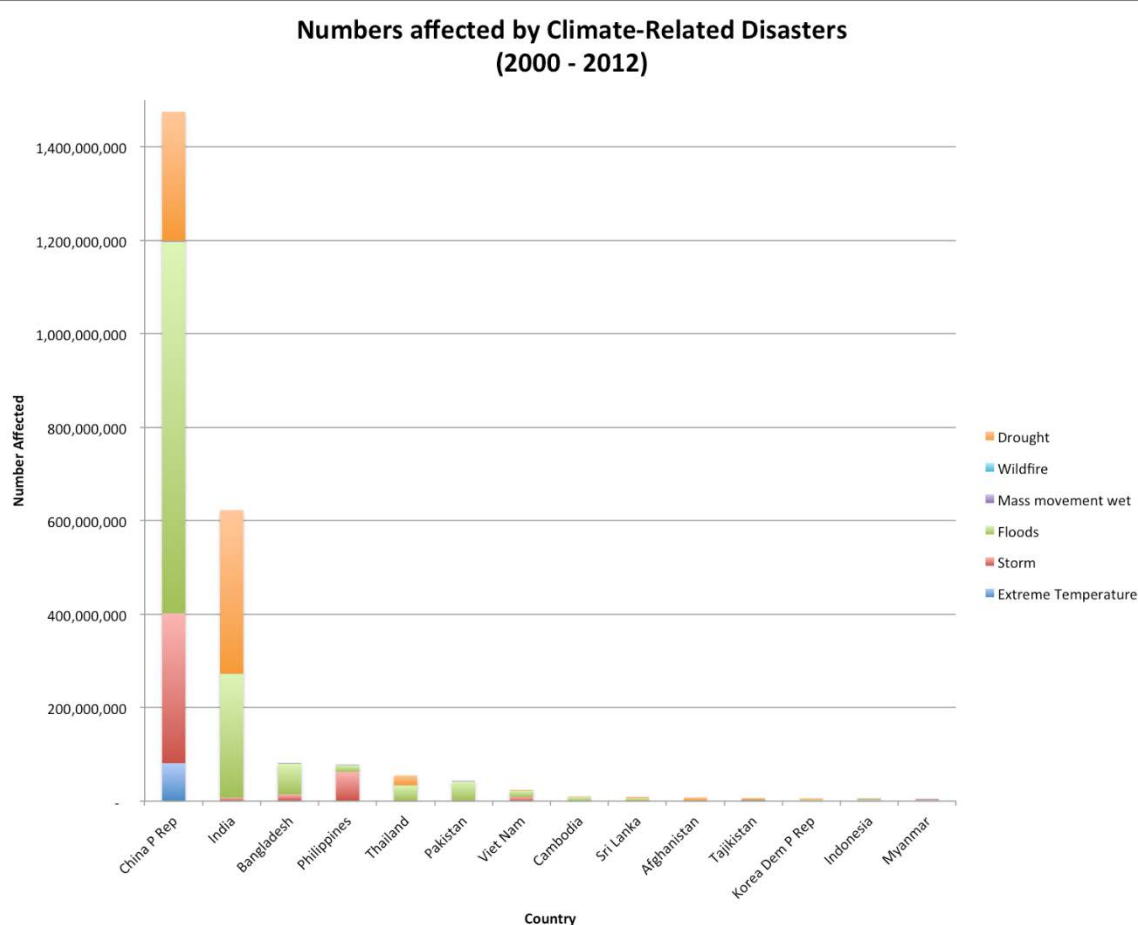
Figure 1. Reported number of victims of climate-related disasters by region



Source: CRED, "EM-DAT."

When we take a more detailed look at country level patterns over the slightly longer time-period of 2000-2012, we see that the most populous countries – China and India – were the most affected by climate-related disasters. Some 60% of those affected were located in China with another 25% in India (see Figure 2). Floods were the main drivers of affected numbers, responsible for 51% of the total, followed by droughts (about 28%) and storms (slightly more than 17%). Single events often drove the size of the estimates for death totals—a 2002 drought in India that affected 300 million, and the 2003, 2007, and 2010 floods in China that each affected more than 100 million people. There is no clear trend in the number of people affected during this period.⁸

Figure 2. Number of people affected by climate-related disasters, 2000 - 2012



Source: CRED, "EM-DAT."

In terms of deaths, some 234,975 people were killed by climate-related disasters during this time period. Of these, cyclone Nargis that struck Myanmar in 2008 claimed nearly 60% of the total. India (23,155), China (15,877) and the Philippines (13,937) followed with the largest number of deaths.⁹

What effect will climate change have on the region, particularly with respect to exposure to climate-related hazards and extreme storms? Current data availability makes this a particularly difficult question to answer with geographic precision and high confidence. The science of climate change attribution for extreme weather events is a young one and contentious. Studies on the future frequency and intensity of extreme weather events in Asia, namely cyclones, have not yet generated strong conclusions and confidence across models. Asia is a diverse and large region; thus the impacts are likely to vary significantly by location.

Nonetheless, the 2014 IPCC Fifth Assessment Report from Working Group II drew some strong conclusions about likely impacts, emphasizing the exposure of coastal and riverine populations to flooding and storm surge, even in the absence of clear signals on cyclone risk. Moreover, the report concluded:

Extreme climate events will have an increasing impact on human health, security, livelihoods, and poverty, with the type and magnitude of impact varying across Asia (high confidence) [24.4.6]. More frequent and intense heat-waves in Asia will increase mortality and morbidity in vulnerable groups. Increases in heavy rain and temperature will increase the risk of diarrheal diseases, dengue fever and malaria. Increases in floods and droughts will exacerbate rural poverty in parts of Asia due to negative impacts on the rice crop and resulting increases in food prices and the cost of living.¹⁰

Thus, though aspects of Asia's vulnerability to climate change remains uncertain, the region remains especially vulnerable, given large population concentrations, particularly along coasts and rivers.

U.S. Interests and Assistance to Asia

Not only do the countries in this region constitute some of those most affected by climate-related hazards, but they are also among those that are increasingly important to the global economy and to geostrategic considerations for the United States. U.S. disaster relief in the region – to countries like the Philippines, Pakistan, and Indonesia – has often had both a humanitarian and a national security and diplomacy component.

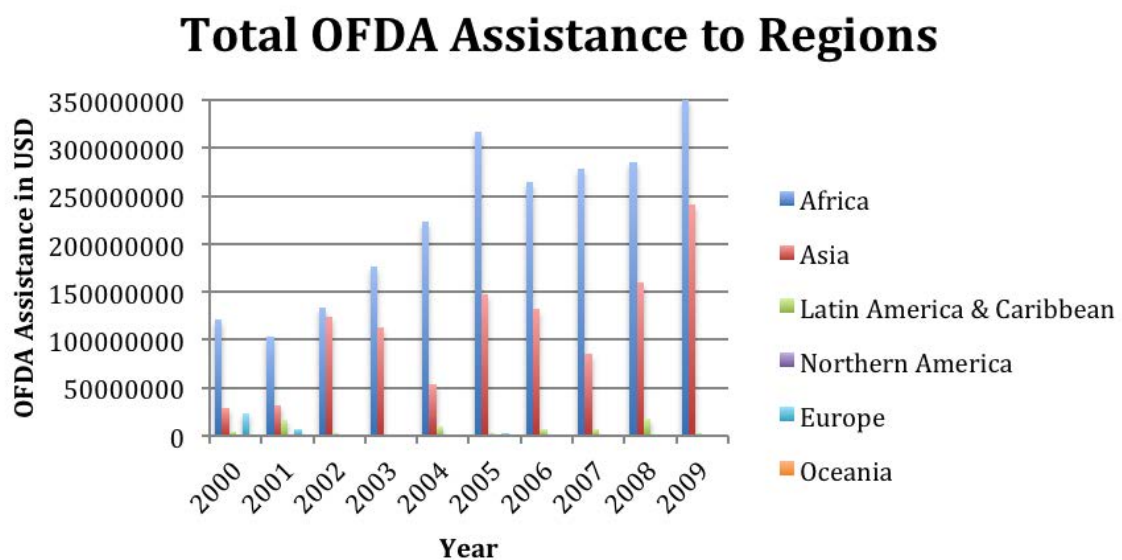
For example, in 2010, the U.S. military responded to the 2010 floods in Pakistan by mobilizing 26 helicopters and three C-130 aircraft, deploying 600 personnel on land with another 4,000 afloat ships offshore. Twenty million pounds of aid relief were delivered, with an estimated value of \$75 million.¹¹ Whether this commitment of resources had a lasting effect on Pakistani public opinion of

the United States is debatable, but there is no doubt that Pakistan’s strategic location and precarious domestic situation were salient factors for U.S. decision-makers. In the context of the 2013 typhoon in the Philippines, guerilla insurrection from Abu Sayyaf alongside maritime disputes with China make political stability in the region and the U.S.-Filipino relationship once again strategically significant.

The importance of disaster response as part of U.S. involvement in Asia is also seen relative to global trends. Of the \$791 million the U.S. Department of Defense spent for all disaster relief between FY2005 and FY2010, nearly \$287 million – 36% – was spent in Asia. If one excludes the \$464 million spent on disaster relief for the Haitian earthquake, the Asia portion of U.S. military disaster relief during this period rises to 87%.¹²

However, while U.S. government disaster assistance by the military focuses on Asia, the same is not true for disaster assistance carried out by civilian agencies like USAID. In preliminary assessments of USAID Office of Foreign Disaster Assistance (OFDA) expenditures from 2000 to 2009, 77% of all OFDA expenditures were directed to Africa and only about 38% to Asia, notwithstanding the fact that nearly 90% of disaster victims were concentrated in Asia (see Figure 3).

Figure 3. Total OFDA assistance to regions



Source: USAID-OFDA, 2010

One reason for these patterns of resource allocation is that OFDA expenditures have been directed to complex emergencies such as the crisis in Darfur that are not reflected in EMDAT disaster statistics.¹³ Moreover, the EM-DAT statistics themselves may undercount African casualties to disasters. For example, the 2011 drought that resulted in as many as 250,000 excess deaths in

Somalia¹⁴ registers in the EM-DAT disaster database with only affected numbers and no deaths. Nonetheless, these national level patterns of resource allocation and disaster victims raise interesting questions about why funds are allocated as they have been.

Climate Change and Security

While a handful of studies have focused on individual countries in Asia or wider regional issues, the implications of climate and security outcomes in Asia remain understudied, particularly among academics.

For example, in a meta-analysis of 60 papers related to climate and security, Hsiang et al. identified 30 studies related to inter-group conflict and another 15 related to institutional breakdown and population collapse.¹⁵ Of these 45 studies, only 8 (about 18%) dealt with Asian countries exclusively, five of them on China alone (with 2 on India and another on Cambodia).¹⁶ Another 8 studies had a global focus to include Asia, but the results are striking when we contrast them with studies on Africa or African countries. 15 of the 45 studies (33%) focused on countries within Africa.¹⁷ We hope to correct this lacuna as part of a newly awarded Department of Defense grant to study, “Complex Emergencies & Political Stability in Asia” within the Minerva Initiative.¹⁸

What explains the difference in emphasis in climate and security? Most of the work in this space focuses on climate change and conflict outcomes. Armed conflicts are not confined to Africa. There exists a so-called “shatter belt” of violence that extends across the Sahel through Central Africa to the Middle East beyond to Afghanistan and Pakistan.¹⁹ Nonetheless, African countries are thought of as the most fragile when it comes to governance²⁰ and are experiencing the largest number of active non-state conflicts²¹ and fatalities from such violence.²² Perhaps the geographic tilt in scholarship is a consequence of expected vulnerability in Africa, given the higher level of some categories of violence and low levels of state capacity. However, it may also be a function of the field of security studies that primarily emphasizes armed conflict.²³

The above discussion highlights the mismatch in geographic and population concentration and the study of climate change and security. Coupled with the disconnect between funding for disasters and disaster outcomes, a better understanding of the specific climate security vulnerabilities in Asia is overdue.

Chao Phraya river flooding near Bangkok. October 2011. [FLICKR/DANIEL JULIE](#)



Conclusion

This short chapter sought to demonstrate that Asia remains understudied in the climate and security literature, particularly among academics, in part because of the strong focus on the associations between climate and conflict. As a consequence, Asia's particular vulnerability to extreme weather events has not received sufficient attention from the climate security community, though that oversight may be less acute among think tanks and practitioners.

Nonetheless, while not a full portrait of resource flows for disaster assistance, this chapter provided some data from one of the largest donors, the United States. While its military disaster assistance does show a strong Asia focus, given the region's strategic importance to the United States and a number of high-profile events over the last decade, the patterns of civilian disaster assistance have disproportionately been directed to Africa. Though that may have ample justification, the relative neglect of Asia's particular vulnerability to climate security consequences and the patterns of resource allocation deserve more treatment in the future.

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Notes

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U.S. MILITARY BASING CONSIDERATIONS DURING A REBALANCE TO ASIA: MAINTAINING CAPABILITIES UNDER CLIMATE CHANGE IMPACTS

Constantine Samaras¹

Abstract

The Department of Defense (DoD) bases in the Pacific serve many different roles as they enable major systems, including force projection, training, equipping, Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), supply and other critical missions. Therefore, these bases underpin the United States security commitments to its allies, and are critical for deterrence, reassurance, and ensuring regional stability. Because Pacific basing options include locations on relatively small islands, the uncertainty involving the timing and magnitude of climate change impacts presents challenges for military planners during a rebalance of forces to Asia. Depending on the base location and the impacts realized, capabilities at individual bases, as well as across the region-wide system counted on during the rebalance planning, may erode over time. Current infrastructure may require adaptation investments, and new infrastructure will require resiliency planning decisions under uncertainty. This article describes the nature and extent of the challenge of climate change impacts and military basing in the Pacific, and discusses the need for robust strategies for maintaining long-term capabilities under climate change impacts during the rebalance to Asia.

Introduction

Picture all of the office space in Midtown Manhattan, the largest business district in the country. Nearly the same amount of floor space is used by the Department of Defense (DoD) in buildings outside of the continental United States across locations in the Pacific region^{2,3}. More than 40,000 DoD buildings sit on Pacific installations and sites comprising more than 1,400 square miles, or 21 times the size of Washington, D.C. The DoD's rebalance to Asia sets up a range of long-term choices about how the Department plans for the future^{4,5}, yet it is infrastructure that provides the footing for the objectives of the rebalance. U.S. bases in the Pacific serve many different roles as they enable major systems, including force projection, training, equipping, Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), supply, humanitarian, and other critical missions. These bases are a visible component of the U.S. security commitments to its allies, and are critical for deterrence, reassurance, and ensuring regional stability. Climate change impacts such as increased heat, changes in precipitation, and sea level rise will affect the performance and life cycle costs of DoD's existing and planned infrastructure, which will affect the military capabilities of the Pacific installations. Hence as part of the rebalance, DoD needs to ensure the military capabilities enabled by installations in the Pacific are maintained under a changing climate.

The DoD Infrastructure Footprint

Globally, the DoD real estate portfolio contains nearly 562,000 facilities on 4,600 sites and 513 active installations, with a planned replacement value of nearly \$880 billion⁶. In Fiscal Year 2014, the DoD spent about nearly \$9.7 billion for new facilities under the military construction program⁷ and about \$11.5 billion for sustainment, modernization and restoration of existing facilities around the world⁸. In addition to the costs of constructing and maintaining facilities, the DoD spends about \$4 billion annually on installation energy costs for electricity, natural gas, fuel oil, steam and other services⁹.

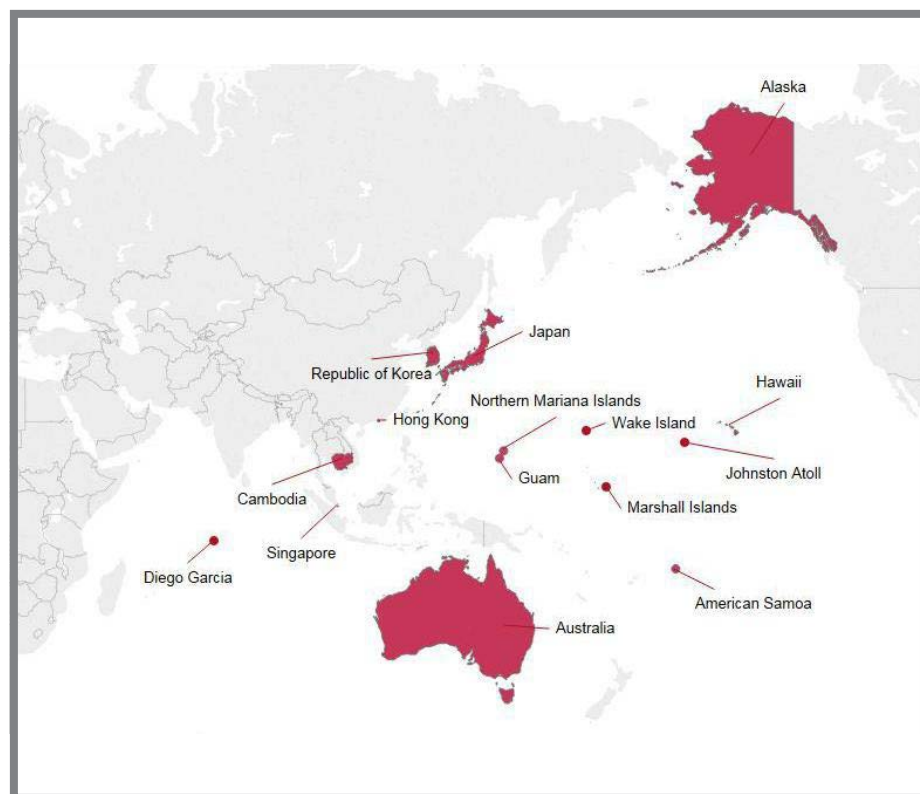


Figure 1. Locations of OCONUS DoD Buildings in the Pacific¹⁴

Rebalancing to Asia brings new focus on the posture and assets of the U.S. Pacific Command (USPACOM), one of six geographic United Combatant Commands of the U.S. military. The USPACOM Area of Responsibility (AOR) encompasses half of the earth's area and includes 49 major bases across multiple Pacific nations (excluding those in the United States)¹⁰. Assets at some U.S. locations outside the continental U.S. (OCONUS) are also included in USPACOM, most notably in Alaska, Hawaii and Guam, and nearly 360,000 U.S. military and civilian personnel are assigned to the USPACOM AOR¹¹. The buildings¹² included in DoD's Pacific real estate portfolio are located in Japan, the Republic of Korea, Diego Garcia, Singapore, Australia, Cambodia, Hong Kong, U.S. territories, and U.S. state locations¹³, as illustrated in Figure 1.

The U.S. presence in the Pacific is heavily coastal, with many smaller islands playing critical roles. For example, the low-lying Indian Ocean atoll of Diego Garcia provides a location for one-third of the U.S. Afloat Prepositioning Force. U.S. ships and subs use its wharf, an Air Expeditionary Wing supports tactical and long-range aircraft, and critical communications are routed through the atoll¹⁵. The U.S. island territory of Guam is also an increasingly important military support and logistics hub, and as much as one-fifth of the U.S. submarine force could conceivably be stationed there¹⁶. As part of the rebalance, the DoD will expand its presence in the Southwestern Pacific, and place a broader emphasis on many of the coastal states of the Indian Ocean²¹.

Climate Change Brings New Vulnerabilities for Infrastructure

Planning for climate change resiliency at defense installations has been mentioned in the 2010 and 2014 Quadrennial Defense Reviews^{18 19}. In reality, reducing climate change vulnerabilities across the Department's vast infrastructure assets translates into a multi-decadal effort. The Defense Science Board recommended that the Pentagon assess the climate vulnerability and adaptation capacity of DoD critical facilities and infrastructure; and that guidance be developed to ensure climate resilience in facility design and construction standards²⁰. In response to an Executive Order²¹, the DoD developed a climate change adaptation roadmap²² that identified five climate change impacts that could affect DoD missions: 1) rising temperatures, 2) changes in precipitation patterns, 3) increases in storm frequency and intensity, 4) rising sea levels and associated storm surge, and 5) changes in ocean temperature, circulation, salinity and acidity. The roadmap recommended integrating climate change considerations into existing processes and using a Robust Decision Making approach^{23 24}, which considers options that are successful across a broad range of uncertain futures. Recently, the Pentagon further outlined²⁵ how changes in temperature, droughts, severe weather, sea level rise, and other conditions would affect the Combatant Commands. What has largely been missing is more tactical in nature – defining how infrastructure designs need to change. The DoD's environmental research unit completed a report assessing climate change impacts on coastal military installations²⁶, and found that these installations were designed assuming the impacts of the natural environment are stationary. With a recognition that long-lived infrastructure will experience climatic conditions that look a lot different from those in the past,

this “history-as-future” approach to infrastructure has finally begun to be reexamined within the DoD and the larger engineering community²⁷.

During a rebalance to Asia, there is a wide range of potential climate change impacts that will affect infrastructure across the Pacific AOR over the near- and long-term. A continuing challenge for decision-makers is that there is uncertainty in the location, timing and magnitude of many of these climate impacts. Since most DoD infrastructure is designed to last 30 to 50 years²⁸, it is imperative to evaluate how climate change impacts affect the performance of new and existing infrastructure in the region.

First, we need to understand how the relationship of coastal installations in the Pacific to the sea, and extreme weather, will evolve. Globally, sea level has risen by about 8 inches since the late 1880s²⁹. By 2100, a realistic low-end projection is an additional 1 foot of sea level rise globally, with an upper end projection of 4 feet or higher³⁰. Sea level rise not only threatens infrastructure over the long-term but a rising sea exacerbates the flooding effects of storm surges and high tides³¹. During severe storm events, water that surges onto installations from the sea can damage installation infrastructure or training areas. Risk from sea level rise and storm surge are not limited to low-lying islands and atolls. While portions of Guam are well above sea level, most of the infrastructure is on or near the coasts and remains exposed to sea level rise and storm surge³². Potentially heavier and more frequent precipitation will also affect installation maintenance costs and require additional flood or erosion control measures³³. Military capabilities and readiness are degraded when airstrips, piers, roadways, communication, energy and other infrastructure are unavailable due to flooding or erosion. Losing access to these facilities is potentially equivalent to temporary anti-access to an area. DoD should consider the capability thresholds required in the AOR and design resiliency and redundancy into infrastructure plans to maintain these thresholds. Pacific installations also need to be especially resilient to natural disasters such as tropical cyclones, as they not only need to maintain capabilities after an event, but often serve as a base of operations

Members of the Papua New Guinea Defense Force prepare to embark aboard the Royal Australian Navy landing ship, as a part of the Pacific Partnership 2010, an annual U.S. Pacific Fleet humanitarian and civic assistance endeavors to strengthen regional partnerships. August 2010. **US NAVY/EDDIE HARRISON**



when DoD is supporting humanitarian assistance and disaster relief. The rebalance enables a portfolio-wide look across U.S. assets in the Pacific to evaluate the likelihood of two or more locations being disrupted from the same disaster, as well as the individual installation resilience to loss of capabilities during severe storm events such as tropical cyclones.

Next, DoD needs to design infrastructure for a hotter world. The most notable change is in the Arctic, where higher temperatures are reducing sea ice and also thawing the permafrost that underlies much of the region's buildings, airstrips and roadways³⁴.

Elsewhere in the warmer areas of the Pacific, high-heat days can reduce the availability of roads and runways, reduce airlift capacity, and limit training opportunities³⁵. Higher temperatures will also affect the way installations provide and use both electricity and water. Installations that use water for power or steam generation, either directly or from host-nations, could see reduced capacity of power plants during hot periods, just as power demand from air conditioning spikes. Increasing the number of active-duty and civilian personnel located in the Pacific will also require more freshwater resources for drinking, lavatories, laundry, and other uses. On many Pacific islands, the cascading combination of increased temperatures, droughts, and saltwater intrusion into groundwater due to sea level rise will reduce the amount of freshwater available³⁶. So when a Pacific installation expands, DoD is making a long-term commitment to energy, water and resource use in the area. Scenarios for energy and water availability and potential solutions need to be included among other criteria in making these important decisions.

Thinking About Infrastructure as a Weapons System

The bulk of the DoD's climate adaptation efforts have been on identifying vulnerabilities, which is important and needs to continue. However, without explicit guidelines about the range of impacts to design for, as well as the resources committed for climate-resilient construction, DoD infrastructure will continue to be built for last century's climate. The GAO found that despite DoD's strategic goal of considering how climate change affects infrastructure, installations officials did not propose climate adaptation projects due to the perception that these would not get funded³⁷. Thus short-term infrastructure interests were apparently traded for higher risks and potential increases in life cycle costs.

The DoD has large acquisition programs in place to plan for the procurement and sustainment of major weapons systems such as aircraft, ships and submarines. Similar to these systems, installations also have long service lives, large capital and operating expenses, and provide a range of military capabilities. Therefore it is possible to think of installations as major weapons systems themselves and employ capabilities-based planning to analyze installation infrastructure investments under a changing climate. Introduced in the DoD's *Quadrennial Defense Review* in

2001³⁸, capabilities-based planning develops the assets and abilities needed for success against surprise, deception and asymmetries. Capabilities-based planning has been applied to examples in Global Strike and Ballistic Missile Defense³⁹, installation energy security⁴⁰, and other cases. The core concept, similar to Robust Decision Making, translates well for climate change impacts and infrastructure: planning under uncertainty to maintain DoD capabilities under a wide range of future challenges while working within cost constraints. Approaching the rebalance to Asia from a capabilities-based perspective would ask: What does DoD need from U.S. Pacific installations in the near- and long-term? What infrastructure investments enable those capabilities? How does climate change degrade those capabilities over time? What are DoD thresholds for the tradeoffs between risks and costs? And finally, what adaptation investments can be made that will maintain capabilities in a wide range of future conditions? This process can result in the specific guidance DoD infrastructure planners need to design and budget for resiliency at installations.

The DoD estimates the replacement value of the structures they use in the Pacific to be nearly \$180 billion⁴¹, which is greater than the combined 2014 annual budgets⁴² of the Departments of Commerce, Energy, Homeland Security, State, and Transportation. Given that level of government investment, DoD has recognized that climate resiliency at existing facilities should be integrated at the installation, Service and Departmental levels⁴³. Yet it is important that climate change impacts not be treated as just an environmental challenge, but be recognized as an issue that will define the landscape in which the future unfolds. In the rebalance to Asia, the choice of installation locations and the types of investments at each location enable a set of military capabilities in both the near- and long-term. The implementation of the rebalance provides an opportunity to assess the impacts of climate change on Pacific installations, estimate the corresponding effects on capabilities, and most importantly, take action to keep these capabilities going forward.

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Notes

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HOW FOCUSING ON CLIMATE SECURITY IN THE PACIFIC CAN STRENGTHEN ALLIANCES: LESSONS FROM THE GLOBAL DEFENSE INDEX ON CLIMATE CHANGE FOR THE U.S.

Andrew Holland
American Security Project

The Climate Security Threats to the Asia-Pacific

Climate change is destabilizing global security around the world. The area around the Pacific is perhaps the most vulnerable to the effects of climate change because of how multiple threats overlap one another. Environmental factors like rising sea levels, declining fresh water availability, worsening food productivity, and the threat of more powerful tropical storms are combining with other factors like rapid urbanization in low-lying river-delta cities, deforestation of tropical forests, and international competition over access to energy resources to make a very dangerous cocktail of threats.

Together, all these dynamics could make ensuring security and stability around the Asian side of the Pacific Rim more difficult in the near term, as climate change acts as an “accelerant” of existing threats. Over the longer term, if climate change is unmitigated, it is not an exaggeration to say that the problems of sea level rise, water and food insecurity, and extreme weather could make some parts of the region ungovernable, even unlivable. For example, low-lying island states like the Marshall Islands, Tuvalu, or Kiribati could cease to exist, with nowhere for the tens of thousands of people living on them to go. On the Asian mainland, sea level rise threatens to inundate key food growing regions like the Mekong River Delta and threatens the long-term viability of major population centers like Shanghai, Jakarta, and Bangkok.

Countries of the Region are Aware of the Climate Threats

Given these threats, perhaps it is heartening that the governments and militaries of the countries

in the region are aware of the problems and are beginning to plan for the impacts. The American Security Project's Global Security Index on Climate Change has sought to quantify how countries around the world view the threats of climate change – and whether their militaries are preparing for it.¹ Even though many countries in the region face a full slate of more “traditional” security threats (like territorial disputes over sea boundaries, historical antagonisms, or the threats on the Korean peninsula), virtually all of the countries in East Asia, Southeast Asia, and Oceania view climate change as a threat to their national security – and most of them have integrated it into their military planning documents. This shared fear of the national security threats of climate change is one of the few things that the fractious nations of the region can all agree on; the U.S. should use this shared threat as a unifying message.

Broadly, these countries can be divided into three categories based on how they view the threats of climate change: (1) mostly developed countries that will provide military aid (let's call them security exporters); (2) victims of a changing climate (call them climate victims); and (3) middle income countries that know enough to be worried, but do not have detailed plans (call them wary watchers).

More developed countries around the periphery of the Pacific foresee that climate change could cause deep insecurity – especially for island states – and they know their militaries will be called in to respond. Perhaps the most active of these security exporters is Australia. Its 2013 Defence White Paper, for example, says:

The combination of the effects of climate change and resource pressures will increase the risk of insecurity and conflict, particularly internal instability in fragile states, many of which have increasingly large populations in areas that will be affected by climate change. These factors, taken together, point to an increasing demand for humanitarian assistance, disaster relief and stabilisation operations over coming decades.²

Other countries that see themselves as “exporters” of security in the region include New Zealand, South Korea, or Japan, each of which has included significant sections on disaster response and instability caused by climate change in their recent defense documents.

On the other hand, the small countries that see themselves as “targets” of climate change have become increasingly insistent about the threats their countries face. For small island states like Kiribati, the Marshall Islands, or Tuvalu, sea level rise makes climate change a truly existential threat – they are expected to be some of the world's foremost climate victims. For example, Manny Mori, the President of Micronesia has said: “We know that our continued peaceful existence is totally at risk. We know that the enemy that gives rise to these threats is climate change.”³ Unfortunately, most of these countries lack any defense planning capability; some have no regular

military forces at all. So, they face an existential threat with little capacity to respond to it.

In the middle of these two extremes lie the middle income countries that have some military and government capability to provide for security from the effects of climate change, but could be overwhelmed by repeated or particularly strong disasters. Countries with highly populated low-lying coastal regions, like Vietnam, Indonesia, the Philippines, or Thailand, are aware of the threat to their security, but an analysis of their defense documents show that they do not have definite policies for how to prepare for the effects of climate change. An example of the wary watchers is Indonesia's Ministry of Defense, saying "Global warming has resulted in extreme climate changes that hit almost all countries."⁴ No doubt this is an important statement, but there is little follow-up beyond that.

The United States, long the predominant military power in the region, understands the clear national security threats that climate change poses to the region. In 2013, Admiral Locklear, the four-star Admiral then commander of U.S. Pacific Command, called climate change the one threat that could destabilize the region over the long term more than any other. American leadership on climate security in the region could help solidify relationships and unify countries around a shared threat: it could even prove to be an effective way to engage with potential adversaries.

When then-Secretary of Defense Chuck Hagel was in Hawaii for the ASEAN Defense Ministers meeting on April 3, 2014, one of the subjects he talked about to the gathered defense ministers from ASEAN countries was preparing for the effects of climate change and disaster response. Building on this engagement will certainly help the United States and ASEAN countries respond to the next disaster – but it will also help restore American leadership overall throughout the region.

Lesson from Typhoon Haiyan Shows Importance of American Engagement

The 2013 storm season in the Central Pacific provided a tragic case study for how the "soft power" of long-term engagement on climate security combined with short-term disaster relief can help U.S. standing in the region. Throughout the fall of 2013, favorable atmospheric conditions combined with abnormally warm water in the deep Central Pacific to spawn five "super-typhoons" with sustained winds greater than 150 mph.

This spate of storms included Super-Typhoon Haiyan, the storm that made landfall in the Philippines with maximum sustained winds estimated at 195 mph – the highest in recorded history to make landfall anywhere in the world. Bryan Norcross, the Senior Hurricane Specialist from the Weather Channel called it "the most perfect storm" he's ever seen.⁵

Where the storm first hit land, on the east coast of the Philippines' Samar Island, towering waves on top of a massive storm surge crashed against the coast, creating high water marks 46 feet above mean sea level – the highest level recorded from a tropical cyclone in at least a century.⁶

The result was that more than 7,000 people died around Tacloban, making Super-Typhoon Haiyan the deadliest typhoon in Philippine history. Filipinos are accustomed to typhoons – they make landfall nearly every year; the country's government institutions and its culture are prepared to weather the storms. Haiyan simply overwhelmed their ability to cope. This typhoon was of a strength unprecedented in human history – how could they have prepared for it?

When a disaster of that scale happens, the US Navy and Marines are the only organization in the Pacific with the logistical capabilities to respond in time in a large enough force to make a difference. Shortly after the storm, Secretary Hagel ordered the USS George Washington's battle group, then on a port visit to Hong Kong, "to make best speed" to respond to the typhoon.⁷ In all, over 13,000 soldiers, sailors, airmen, and Marines were engaged in the Humanitarian Assistance/ Disaster Response (HA/DR in military acronyms) mission to the Philippines.⁸

U.S. Marines help displaced Philippine nationals from the back of a KC-130J Super Hercules at Vilamor Air Base, Manila, Republic of the Philippines Nov. 11. DVIDSHUB / LANCE CPL. CALEB HOOVER



That response certainly saved lives: even weeks after the typhoon, doctors, transported to remote areas by Navy and Marine helicopters, were treating patients hurt in the storm. Moreover, these HA/DR missions provide more than simply food, fresh water, and supplies; they can prevent a downfall into lawlessness. In the days immediately after the storm, there were reports of radical Filipino insurgents hijacking aid supplies from Filipino government convoys. U.S. Marines are a harder target – and their presence helped to quell such violence before it became common.

American Engagement on Climate Security and Disaster Response Capability Increased American Influence

U.S. military engagement on this issue is important because it prepares for the next storm and it boosts American soft power in a region that too often only sees the U.S. through its military perspective. Whether we like it or not, the U.S. military is one of the most visible faces of American presence around the world. The fact that U.S. Pacific Command and the Department of Defense are preparing for climate change can help to align American interests with the other nations in the region that view climate change as a clear threat to their security.

Immediately after the storm, the Filipino Climate Change Ambassador, Yeb Sano, made an impassioned speech to the global negotiators assembled in Warsaw for the round of UN negotiations leading to a successor to the Kyoto Protocol. In a tearful address, he said “What my country is going through as a result of this extreme climate event is madness.”⁹ If the United States military had not responded in the way it did, and if the U.S. leadership in the Pacific had actively denied the link between climate change and security, it is easy to see how there could have been a backlash against American interests in the region.

Instead, in April 2014, President Barack Obama visited Manila to sign a new U.S.-Philippines defense pact. Certainly, most of the thrust driving that treaty forward was the rise of China, particularly their aggressive actions in the South China Sea. Nonetheless, the quick American response after Typhoon Haiyan served to remind the Filipino government and people (who have not always supported American military engagement) why it is important to have the U.S. Navy on your side.

To underline the importance of climate preparedness to this agreement, the first joint U.S.-Philippine exercises since the pact was signed – the Balikatan war games, held in early May – included a HA/DR exercise to Tacloban, the very city which had been devastated by Typhoon Haiyan.

How to Engage Different Countries in the Pacific on Climate Security

Unfortunately, the route to increase American influence is not as simple as going out and saying that the U.S. “cares” about climate security. Instead, America’s military and foreign policy should target each country differently, based on its interests. The three categories discussed previously are (1) the security exporters; (2) the climate victims; and (3) the wary watchers. These categories can broadly define how the U.S. can use engagement on climate security as a way to increase influence. The “security exporters” include most of the big, developed countries, like South Korea, Japan, Australia, and others. These countries foresee that the effects of climate change could harm the security of countries in the Pacific – and that if they allow instability to fester it could grow into conflict, drawing in their armed forces. Therefore, they see that their military mission around climate change is to provide HA/DR and stabilization operations prior to such destabilization. Probably the best way for the U.S. to engage with these countries – nearly all of whom are already U.S. allies – is to combine planning operations for future HA/DR and stabilization missions. The U.S. should actively seek personnel exchanges with planning and operations officers and staff between Pacific Command Headquarters and their military headquarters.

The “climate victims” include all of the small island states at the heart of the Pacific. These countries have been emphatic in multiple international fora that they are unable to deal with the predicted effects of climate change and they need compensation for the “loss and damage” expected. Working with these countries is not simply about military-military engagement, because they often do not have a military establishment. To complicate matters, these small countries are increasingly on the receiving end of direct engagement by Chinese government officials.¹⁰ The U.S. should work directly with these small countries, in the most visible way possible. Pacific Command can use port calls, while U.S. military units can deliver direct U.S. foreign aid for climate adaptation.

The most difficult countries to engage with on climate security are the “wary watchers” – those countries that know they are directly threatened by one or more of the effects of climate change, but have not yet determined how their militaries should respond. They may also be the most valuable for the U.S. to engage with – countries like Vietnam, Indonesia, and the Philippines are clearly threatened by rising sea levels and extreme weather. As they are developing countries, their militaries often do not have the resources to respond to acute extreme weather events. In addition, they may not have the planning capacity to be able to prepare for the effects of climate change. The U.S. military should use its demonstrated expertise in these missions to work with these countries. Every joint bilateral or multinational exercise should include HA/DR drills. Sharing weather and climate predictive capabilities would also engender goodwill.

Conclusion

Planning for climate change is important in the Pacific area of operations because climate change will fundamentally alter the operating environment in ways that will cause harm to the national security of countries around and within the Pacific. However, planning for climate change in the region is also important because the other countries in the region perceive it as important. As Dale Carnegie says in *How to Win Friends and Influence People*: “To be interesting, be interested.” In other words, in order for the U.S. to gain influence in the Pacific, the U.S. must be interested in what interests countries in the region: and the threats posed by climate change interest them deeply.

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ADDRESSING CLIMATE CHANGE AND ENHANCING ENVIRONMENTAL SECURITY IN THE ASIA-PACIFIC REGION

J. Scott Hauger

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“Climate change ... creates both a need and an opportunity for nations to work together, which the Department will seize through a range of initiatives.”

– U.S. Department of Defense Quadrennial Defense Review (QDR) 2014¹

Climate change is solidly on the U.S. national security agenda in 2015. In the Asia-Pacific region, Admiral Samuel J. Locklear III, Commander, U.S. Pacific Command, identified climate change as a pressing long-term threat, and characterized it as a driver for regional cooperation to better respond to natural disasters.² In a major policy address in Jakarta, in February 2014, Secretary of State John Kerry stated that, “This year... I will engage in a series of discussions on the urgency of addressing climate change – particularly on the national security implications and the economic opportunities.”³ In November 2014, President Obama and China’s President Xi Jinping agreed to work together to promote an agreement on greenhouse gas mitigation at the Paris Conference of the Parties of the United Nations Framework Convention on Climate Change.⁴

Climate-related global change presents a transnational, regional challenge to governments, international organizations and NGOs across the Asia-Pacific region. It also represents an opportunity to develop new knowledge and new approaches to manage the complex issues of climate change and security. As the U.S. works to operationalize its top-level policy of rebalance to the Asia-Pacific, it must consider and integrate these issues into its plans and activities at the regional level.

Other global trends that characterize the Asia-Pacific region -- including population growth,

urbanization, economic development, air and water pollution, the growth of the middle class and associated increases in resource demands -- interact complexly with the effects of global warming to threaten environmental security. Climate change is a global phenomenon, but its impacts are experienced locally and tend to differentiate along geographical rather than political boundaries. The Asia-Pacific region is recognized as highly vulnerable to the projected impacts of climate change. For example, the United Nations Environmental Program (UNEP) states that, "Asia-Pacific is one of the most vulnerable regions to climate change and impacts are likely to become more intense in the future."⁵ According to Maplecroft's Climate Change Vulnerability Index, all five of the world's cities that are at extreme risk from climate change are in Asia – Dhaka, Mumbai, Kolkata, Manila and Bangkok.⁶

Vulnerable geographic areas in the Asia-Pacific region include:

- the glaciated and snowy highlands of China and Central Asia that comprise the water tower of the continent,
- downstream nations in South and Southeast Asia that depend on predictable and accessible surface water from the great rivers originating there,
- desert and drylands vulnerable to drought and desertification,
- vast areas dependent on predictable monsoon rains for agricultural sustainability,
- coastal regions, especially sea level megacities exposed to both flood and storm, and
- low-lying island nations and coral reefs, vulnerable to sea level rise, tropical storms and acidification of the oceans due to increased carbon loading of the atmosphere.

These shared geographic vulnerabilities to climate change suggest opportunities for regional collaboration to share knowledge and best practices for climate adaptation and security cooperation that may not coincide with geopolitical boundaries and existing regional security organizations.

Security preparedness and response, whether to national or transnational threats, is understood to be the responsibility of sovereign nations. This was recognized by the U.S. Department of Defense in the 2010 QDR, which first articulated the strategic security implications of climate change: "...climate change could have significant geopolitical impacts around the world, contributing to poverty, environmental degradation, and the further weakening of fragile governments."⁷ The report went on to recommend proactive engagement with vulnerable nations where the military may be the only institution with a capacity to respond to major natural disasters. Clearly, managing the impacts of climate change will require new modes of regional security collaboration.

We can draw three conclusions from this brief discussion: (1) Climate-related global change is a direct and substantial, if slow-motion, threat to many nations in the Asia-Pacific region; (2) It is in the mutual interests of vulnerable nations in the Asia-Pacific and the United States to work together to understand, prepare for and address the national and regional security issues associated with climate change; and (3) Bilateral initiatives are not enough. These transnational

issues can be fruitfully addressed through multilateral initiatives based on geographic vulnerability as well as cooperation through existing regional organizations with a geopolitical base. This is the environmental security context within which the U.S. government must manage its rebalance toward the Asia-Pacific.

Because many Asia-Pacific nations are more directly threatened by climate change than is the United States, the U.S. must be responsive to those national interests and priorities in its engagement with the region. As part of its rebalance to the Asia-Pacific, the U.S. can bring important assets to bear on the management of climate-related global change. Because the U.S. has an advanced science and technology base, it can provide leadership in knowledge creation to address climate-related issues. Drawing upon its domestic experience in interagency and whole-of-society participation in governance, the U.S. can help envision new paths for regional security sector development to address the complex and emerging problems of climate-related global change.⁸ Because the U.S. Pacific Command has the planning and operational expertise to assist its allies and partners across the region, the U.S. can play a leading role in facilitating security sector development and cooperation to address these problems at the operational level. A rebalance to the Asia-Pacific can build upon these capabilities.

What are the opportunities and challenges for U.S. activities to address climate change and improve security governance in the Asia-Pacific region? First, there is an underlying need for knowledge creation and dissemination among security practitioners regarding the nature and extent of the threat and its complexity. Secondly, there is a need for international and interagency networks to craft collaborative, adaptive strategies that can support vulnerable nations in reducing the threat. Both of these needs in turn imply a third – the need for education and training of security professionals and their civil sector counterparts to address these issues collaboratively.

The need for more useable knowledge about climate change is a general one, not limited to decision making in the security sector. According to a recent analytical review, “Actionable Knowledge for Environmental Decision Making”, new approaches are needed to “surmount the usability gap” between scientists and decision makers.⁹ Specific to the security sector, in a 2011 report, the U.S. Defense Science Board emphasized the need for a DoD climate information system database and the need for DoD to adopt a whole-of-government approach to climate change issues. The report made specific recommendations for the role of regional combatant commands (COCOMs), including PACOM. Among them, COCOMs should:

- develop information on countries and areas within the region that are at greatest risk, the nature and scope of climate impacts, and ways to address them;
- raise awareness of climate issues with partner nations and their militaries;
- take an interagency approach to addressing topics related to climate change ;
- include these topics in theater campaign plans; and
- work to enhance host nation capabilities to plan and respond to natural disasters consequent to climate change.¹⁰



Marines listen to Admiral Samuel J. Locklear, commander of the U.S. Pacific Command, speak aboard Marine Corps Air Station Miramar, Calif. Locklear answered questions about current affairs as well as the future for the Marine Corps presence in the East. DVIDSHUB / LANCE CPL. CALEB HOOVER

Greenhouse gas (GHG) mitigation to reduce the carbon load in the atmosphere is key to slowing the rate of global warming and avoiding the worst consequences of climate change. But governance for mitigation is exercised primarily at the global level through the United Nations Framework Convention on Climate Change (UNFCCC) and its annual conferences of the parties, most recently held in Lima, Peru in December 2014. The principal roles in mitigation for security agencies at the regional level are to set a good example by reducing their own emissions and to provide technical support to partner nations seeking to do the same. In the Asia-Pacific region, PACOM policy is to engage partners across the region to increase energy efficiency and the use of renewable resources in close cooperation with allies and partners and with other U.S. government agencies.¹¹

Perhaps the greatest need and the greatest opportunities for regional collaboration are in the creation of adaptive strategies to prepare for the impacts of climate change. However successful or unsuccessful the world may be at carbon mitigation, scientists project that global warming will continue to increase under any feasible scenario, at a rate based on the level of future GHG emissions.¹² According to the latest assessment report of the Intergovernmental Panel on Climate Change (IPCC), climate change has already had an impact on environmental security. Most

notably in the Asia-Pacific region, changing patterns of precipitation and melting of snow and ice are affecting the quality and quantity of water resources. The region is also experiencing climate-related weather extremes leading to droughts, floods, cyclones and wildfires.¹³ The report, issued in March 2014, forecasts security risks for the remainder of the 21st century, including human migration, and climate-related threats to "...the critical infrastructure and territorial integrity of many states..."¹⁴ It also identifies for policy makers a specific set of international and cross-sectoral adaptation issues and prospects by region that can help to reduce the risk.¹⁵

In a 2012 strategy research project for the U.S. Army War College, Colonel James D. Golden argued that a reactive posture to climate-related impacts is not an appropriate strategy for PACOM. He recommended "...a shift in strategic focus for USPACOM towards adaptive strategies to deal with climate change, and thus to avoid a reactive posture to the accelerants of instability caused by climate change that threaten regional security."¹⁶ This proactive approach, he concluded, would require the development of a cooperative coalition of as many PACOM nations as possible, working together to develop new knowledge through vulnerability analyses, and forging a strategic narrative focused on the gravity of the threat. He called for a commitment by PACOM, working with other agencies and NGOs to "...aggressively pursue adaptive strategies with all states seeking to lessen the impacts of climate change events."¹⁷

The Defense Science Board report, the IPCC report, and the Army War College strategic research paper agree that there is a fundamental need for more knowledge of specific national vulnerabilities to climate change in the region. They further agree that international and interagency collaboration are essential to a strategic regional approach for an effective response to climate change. In the Asia-Pacific region USPACOM is engaged in a variety of activities to develop and implement such an approach. Much of PACOM planning occurs under the rubric of environmental security (ENVSEC), which is incorporated into the Theater Campaign Order and individual country engagement plans. An All Hazards Working Group is currently working on ENVSEC considerations for incorporation into the Theater Campaign Plan. Disaster response and training are ongoing PACOM missions. Since 2011, PACOM has sponsored annual environmental security conferences around the region. Most recently, the President of Kirabati has asked PACOM for engineering expertise to analyze the potential impacts of climate change on that island nation.¹⁸ In 2013, PACOM staff joined with Oahu-based officers from the National Oceanic and Atmospheric Administration, the Department of the Interior, the East-West Center, and the Asia-Pacific Center for Security Studies to establish a working group on Climate, Environment and Security in the Asia-Pacific Region, which meets regularly to exchange information and coordinate activities related to security and climate change.

Of special note is the role played by the Asia-Pacific Center for Security Studies (APCSS), one of five regional centers reporting to the respective Geographic Combatant Commander and resourced through the Defense Security Cooperation Agency (DSCA). The mission of the centers is to "... build partner capacity by addressing regional and global security issues with strategic level military

and civilian leaders through courses, seminars, workshops, research and dynamic outreach in an educational environment.”¹⁹ The Under Secretary of Defense for Policy has established priorities for the centers that are pertinent to the intersection of American rebalance to the Asia-Pacific and the security impacts of climate change: to contribute to the rebalance, to work to develop enduring partnerships, to build approaches that engage the whole of government, and to assist in identifying future trends that will shape the security environment.²⁰ APCSS is specifically directed to build common perspectives on regional challenges including climate change.²¹

The APCSS College of Security Studies (CSS) implements the center’s mission through a combination of education, outreach and research programs. The APCSS education program comprises six in-residence, executive education courses for mid-career and senior security professionals from across the region. Each year about 800 fellows attend these courses to learn and to share knowledge of comprehensive regional security issues, including both traditional and transnational security challenges. Fellows come from every nation in the Asia-Pacific region (including the U.S.), except DPRK. About half are military officers and about half from civil sector agencies including foreign affairs, police, and economic development. Key elements of the curriculum include panels, exercises, and seminar discussions which foster collaborative, international and interagency problem solving. Environmental security and climate change have been a core topic of these courses for more than five years. An underlying theme has been the complexity of climate-related security issues at the food-water-energy nexus, and the need for regional security sector development and inter-agency and cross-sectoral collaboration to better manage the impacts of climate-related global change. On returning home, the APCSS Alumni Office and national alumni associations provide support to continuing interaction among fellows across the region, including an on-line portal, “or community of interest” for fellows interested in climate change and environmental security.

The APCSS outreach program has sponsored an ongoing set of regional workshops on topics related to environmental security and climate change. Recent workshops include, “The Environment & Security in the Pacific Islands Region” (Honolulu, 2012), “Charting the Water Futures of South Asia” (Boston, 2013, with Harvard Kennedy School and the Near East South Asia Center), and “Effective Security Governance to Address the Impacts of Climate Related Global Change” (Lanzhou, 2013, with the Chinese Academy of Sciences). Each of these workshops brings together about 40 senior security practitioners and subject matter experts from across the region to share knowledge and perspectives and to chart a way ahead for collaboration to better manage the issues at hand. CSS faculty members are also active in research and publication in areas related to environmental security and climate-related global change.

Through these programs, over the last five years, APCSS and PACOM have undertaken operations that implement high level, U.S. and DoD policies concerning climate change and security within the parallel policy context of rebalance. The approach is one of building international and interagency networks to exchange knowledge and to craft collaborative adaptive strategies to meet

the emerging challenges of climate change. As this slow-motion crisis continues to unfold, regional awareness will continue to grow across the security sector and beyond. As scientific knowledge of the nature and impacts of the phenomenon increases, the security community will increasingly need to tap into that knowledge base and even to steer research to better address security concerns. Nations will continue to work together in disaster response and humanitarian assistance operations. They will increasingly need to address extreme weather impacts and issues of human health and migration that may arise from climate-related global change. As part of the rebalance, the United States and PACOM must play a facilitative leadership role in these activities.

The opportunity exists now for proactive education and network building for adaptive management of the problems of climate-related global change – problems that the IPCC predicts will grow for the foreseeable future. Security policies at the national level now provide the basis for those activities, with support at the highest levels of the administration. Security priorities of vulnerable nations in the Asia-Pacific region reinforce the need for U.S. attention to those policies as part of its strategic rebalance to the Asia-Pacific. PACOM has worked to articulate the need and to implement those policies at the COCOM level. APCSS is providing an experienced and trusted platform for knowledge creation and dissemination, for networking, and for education of security practitioners across the region. The challenge ahead, for the U.S. and its partners, is to adaptively learn and improve our efforts to educate, connect and empower security professionals in the Asia-Pacific region to collaborate in the management of the security impacts of climate related global change.

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REGIONAL AND COUNTRY CASE STUDIES

CLIMATE CHANGE AND VIETNAMESE FISHERIES: OPPORTUNITIES FOR CONFLICT PREVENTION

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Introduction

The fishing sector is vital to Vietnamese prosperity and important to all nations bordering the South China Sea. China, Thailand and Vietnam accounted for 80 percent of world fishery production in 2008 and 50 percent of fishery export value.¹ In 2009, Vietnamese fisheries accounted for 6 percent of gross domestic profit. In 2010, 7.4 percent of economically active people were engaged in fishing, the second highest percentage worldwide after Fiji.² Vietnam rose to the position of the fifth largest exporter of fish and related products between 1998 and 2008 when the catch was valued at nearly US \$5 billion. A flourishing aquaculture industry, rather than increases in offshore capture fisheries, explains much of its rise. In 2007, aquaculture production surpassed capture fisheries.³ Pangasius, a catfish species, and marine and freshwater prawns comprise the majority of exports in this sector.⁴

Vietnam's capture fishing grounds are vast. The UN Convention on the Law of the Sea (UNCLOS) grants nations the right to declare an Exclusive Economic Zone (EEZ) of 200 nautical miles from an established coastal baseline over which it has exploitation rights to all natural resources.⁵ Vietnam's EEZ encompasses more than 1 million square miles, including 3,000 islands and 2,000 species of fish: 130 of these species have high economic value.⁶

Eighty percent of the world's fish stocks are overfished or at maximum capacity.⁷ This situation is especially evident in the South China Sea where coastal fishing grounds have been depleted to between 5 percent and 30 percent of their unexploited stocks.⁸ Consistent with this trend, unsustainable fishing practices have been confirmed in local areas within the Vietnamese EEZ. A large amount of the over-withdrawal can be attributed to the incursion of foreign fishing vessels. Declining yields have been exacerbated by environmental destruction of many kinds including that

associated with tsunamis and cyclones.⁹ These stressors limit Vietnam's options for maintaining food security and could increase the likelihood of international clashes over fishing rights.



Teaeki luta, supervisor of the Milkfish Fishery, and a Pacific Partnership 2013 preventative medicine team inspect a screen used at the fishery for effectiveness. July 2013. DVIDSHUB / PETTY OFFICER 2ND CLASS LAURIE DEXTER

Climate Change: Physical Impacts

Vietnam is one of the developing countries most exposed to climate change by nature of its geography. Twenty-four percent of Vietnam's population lives in coastal districts.¹⁰ Storms and related damage from floods and tidal surges are among the most significant impacts.¹¹ Coastal mangroves, salt marshes and coral reefs – critical to breeding marine life – are all endangered. Warming ocean temperatures associated with climate change will also change migratory patterns of fish in the open sea.¹² Fish stock scarcity caused by altered migration patterns is compounded by over-fishing.

Worldwide, climate change-driven changes in the distribution of sea life are expected in every marine ecosystem.¹³ New scientific analytical approaches are improving our understanding of the magnitude and extent of these effects. A meta-analysis of studies on range shifts of ocean aquatic species in the *Journal Science* by I. Ching Chen et al. finds that more than 89 percent of 29,000 observational data series from 75 studies demonstrate the consistency of worldwide fish migratory patterns toward the north or south poles in response to warming temperatures.¹⁴ A 2013 study from the journal *Nature* confirms these results.¹⁵ New research in the journal *Science* in June 2015 amplifies these findings by demonstrating that lower oxygen caused by warming is putting too much physiological strain on marine animals living closest to the equator, also driving species toward the poles from tropical ocean waters. As temperatures rise, fish metabolisms speed up, increasing the demand for the scarce oxygen.¹⁶ Species in the South China Sea are migrating to colder waters in higher latitudes at a rate of approximately 17 kilometers per decade.¹⁷ All of these findings have significant negative implications for Vietnam. Northern migration of economically vital fish stocks into waters claimed by China is an emerging security concern.¹⁸

Climate change will also deplete aquaculture yields. Global aquaculture is concentrated in the world's tropical and subtropical regions, with Asia's inland freshwaters accounting for 65 percent of total production. In Vietnam, freshwater, coastal and offshore open water are all suitable environments for aquaculture. However, aquaculture production is concentrated in the Mekong River Delta where sea level rise and associated surges are causing harmful saline intrusion into brackish and freshwater hatcheries.¹⁹ Extreme weather events such as floods damage aquaculture farms by displacing water, spreading disease, and destroying infrastructure.

Major Physical Effects of Climate Change on Vietnamese Fisheries

Cyclones, Typhoons

Based on a range of models, it is *likely* that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and heavier precipitation associated with increases of tropical sea-surface temperatures.

Flooding

Coastal areas, including heavily-populated Mekong mega delta region, will be at greatest risk due to tidal surges and sea level rise.

Ocean Acidification

Progressive acidification of ocean water destroys corals and their dependent species. Vietnam has a limited reef system but fish species migrate northward from the fragile Coral Triangle reef system.

Rising Temperatures

Shifts in ranges and changes in algal, plankton and fish abundance are associated with rising water temperatures, as well as related changes in salinity, oxygen levels and circulation.

Sources: IPCC (2014) (2007), T. Daw et al. (2009), I-Ching Chen et al. (2011)

Climate Change: Socioeconomic Impacts

While peer-reviewed physical science identifies likely fish stock migration in the South China Sea, the socioeconomic implications of these changes have not been examined. The Notre Dame Global Adaptation index (ND-GAIN) compares a country's level of vulnerability to climate change to its readiness to deal with these impacts. As the 77th most vulnerable country and the 63rd least ready of 177 countries in the index, Vietnam faces significant challenges; yet there is also room for optimism that Vietnam can increase its readiness.²⁰ Vietnam has moderate capacity to adapt to climate change given its status of economic development and relatively good governance, a part of which is some climate change adaptation planning at the federal level.²¹ However, continued reliance on declining fisheries may reduce Vietnam's moderate adaptive capacity with serious negative implications for economic development and food security.

It is hard to overstate Vietnamese reliance on fisheries. A comprehensive study by Malone et al. of the importance of fisheries to national economic and food security ranks Vietnam as the most sensitive country in the world.²² This study ranks Vietnam as 24th in the world in terms of relative national economic vulnerability specifically to climate change-driven impacts on capture fisheries.²³

²⁴

These findings alone should send a resounding warning to Vietnamese policymakers about the need to rapidly develop adaptive measures to maintain the viability of fisheries. However, fishers who already live in conditions of poverty are facing an evolving political system where economic reform is removing social safety nets associated with the formerly centrally-planned economy. This economic adjustment suggests that conditions will likely worsen for the rural poor, including subsistence-level farmers and fishers, before they get better.²⁵

It is reasonable to conclude that shifts in the distribution of species associated with warming of the oceans will have the greatest impact on the food security of poor (or artisanal) fishermen. These fishermen use boats, often without motors or navigational technology, which have a range of only a few miles offshore. The waters closer to the Vietnamese coastline are warming at a higher rate so that fish stocks are moving further out to sea, possibly beyond the range of artisanal fishermen. Another concern is that every major typhoon destroys an increasing number of small fishing boats and homes faster than they can be replaced.

Depletion of the fisheries and resulting economic damage may be a "push factor" for migration. For Vietnamese people, expected income differentials and the anticipation of better public services are contributing factors to inter-provincial migration from rural to urban areas.²⁶ For example, poor fishers in Ca Mau Province are reacting to loss of income resulting from a decline in off-shore fisheries by migrating to other provinces.²⁷

The proportion of overall migration to urban centers is quite large. Population concentrations in urban areas are more susceptible to natural disasters such as typhoons. Vietnamese migration

policies and practices, such as credit and lending policies that favor members of the Kinh ethnic majority over other ethnic minority groups, have created tensions that could lead to internal conflict.²⁸

As noted, aquaculture has become an increasingly important source of livelihood for ethnic minorities, particularly the Thai, Tay, and Sedang, three of the 54 distinct ethnic groups recognized by the Vietnamese government. Households belonging to ethnic minorities are generally poorer than those of ethnic majorities.²⁹ A 2011 survey found that reliance on aquaculture was a significant factor in Vietnamese minorities' vulnerability to poverty.³⁰

Potential for Conflict

The Southeast Asian region's open sea fisheries are located amidst a complex security architecture featuring several overlapping maritime territorial claims. Vietnamese fishing vessels following the northward fish migration or reacting to fisheries depletion within the EEZ are likely to be intercepted by Chinese patrol vessels, fanning the flames of existing maritime territorial disputes. A handful of disputes such as that surrounding the Spratly Islands cause Vietnam to be in conflict with neighboring states, but China is the most strategically significant. The map below illustrates the claim of each littoral country of the South China Seas to an EEZ under UNCLOS, relative to China's claim.

Vietnam's relationship with China is arguably the most complicated and conflict-prone in the region. China is a former colonial power and the last all-out war between the nations was only 35 years ago in 1979. Since that time Vietnamese-Chinese bilateral security relations, while cordial in some respects, have been dominated by three challenging territorial issues: demarcation of the mutual land boundary; delineation of the Gulf of Tonkin; and overlapping sovereignty claims in the South China Sea.³¹ Vietnam's economic dependence on China complicates the existing security relationship: China is Vietnam's largest trade partner and the latter runs a significant trade deficit with the former.

Chinese Territorial Claims Relative to UNCLOS EEZs

In 2004, China and Vietnam ratified the Agreement on Fishing Cooperation in the Gulf of Tonkin located between Hainan Island and the Vietnamese mainland (see map). The agreement delineated exclusive and common fishing areas, in an attempt to reduce the potential for conflict. However, China instituted a ban on fishing during peak fishing (spawning) season from May to June below the agreed-upon Chinese area of control. Incursions into this zone by Vietnamese trawlers have been met with violence, seizures of vessels and heavy fines. The most deadly incident took place



Source: BBC News <http://www.bbc.co.uk/news/world-asia-pacific-11152948>

in January 2005 when Chinese patrol boats opened fire on Vietnamese fishing trawlers, killing nine crewmen. China has accused Vietnamese fishermen of attacking their trawlers in the Gulf of Tonkin.³² Elsewhere, in March 2013, a

Chinese patrol craft fired warning flares that set fire to a Vietnamese fishing boat near the disputed Parcel Islands.³³

Violent incidents are more common further south in the disputed Spratly Archipelago. In April 2007, China patrols detained four Vietnamese fishing boats for an extended period and later that year rammed a Vietnamese vessel, resulting in one death. While a formal declaration of war over fishing stocks is unlikely, there is precedent for small confrontations involving fishing vessels to escalate into wider international conflicts.

The Cod War of 1975 between Britain and Iceland and the Turbot War of 1995 between Canada and Spain were very limited in scale. However, they illustrate that disputes over natural resources can quickly spiral out of control even among member of security alliances such as NATO.

Volatile socioeconomic conditions on the Vietnamese mainland have already been noted. Climate change impacts such as flooding and typhoons can cause significant population displacement. Confrontations between existing landowners and displaced people have the potential to exacerbate existing tensions between majority and minority ethnic groups. Land disputes are prevalent in Vietnam. Over one million complaints concerning land were estimated to have been lodged between 2009 and 2014 and some have led to violent outcomes.³⁴

Thomas Homer-Dixon, a leading scholar, identifies three conditions under which environmental scarcity can be a driver for violent conflict. They can be summarized as 1.) A decrease in supply of a controllable resource leads to simple scarcity conflict 2.) Environmental scarcity causes economic deprivation which in turn disrupts key social institutions causing civil strife and 3.) Large population movements caused by environmental stress exacerbate group identity conflicts.³⁵ This research suggests these climate change's impacts on Vietnam may trigger these conditions.

U.S. Strategic Interests and Opportunities for Engagement

Maintaining an advantageous balance of power in the South China Sea is a primary U.S. strategic goal. In February 2014, the U.S. officially rejected China's maritime claims – including those adjacent to Vietnamese waters – on the basis that they are contrary to international law. The horseshoe-shaped territorial lines demarking the Chinese EEZ were not drawn based on land features as required by the UNCLOS, a treaty the U.S. has not signed but observes at least in this case.³⁶

Vietnam is a natural ally in the region because its ability to project power acts as a check against Chinese hegemony in the South China Seas and cooperation between the countries is growing on several levels. However, it is essential that the United States avoid a situation where conflict such as a minor maritime dispute evolves into a larger conflagration where Vietnam is at a profound disadvantage and may request U.S. military assistance. Confrontation on any level based on depleted natural resources sets a dangerous precedent in the region. It is therefore in the interest of the U.S. to take active measures and develop plans for conflict prevention.

Open sea capture fisheries management is an opportunity for the U.S. Coast Guard (USCG), the organization with primary responsibility for maritime law enforcement, to engage with Vietnam and possibly China. Sporadic U.S.-Vietnamese cooperation already exists. In 2009, the USCG conducted a joint course on maritime boarding techniques. This was followed by more action in 2012, where the USS *Waesche*, one of the USCG's three "National Security Cutters" capable of global deployment, conducted a 161-day mission to Southeast Asia and the Pacific region. This mission also included tactical training and fisheries restoration management.³⁷

Coast Guard capacity building around enforcement is important because the Association of Southeast Asian Nations (ASEAN) has developed an international regime to regulate fishing in the South China Sea. However, much like the Tonkin Agreement between China and Vietnam, it lacks an effective enforcement mechanism, partially due to lack of capacity. An increased USCG presence could help build this capacity and minimize the potential for conflict. In March 2013, China announced plans to merge five agencies, with law enforcement power over waters that China claims, into a unified Coast Guard called the State Oceanic Administration.³⁸ The existence of this unified organization could facilitate cooperation with the U.S. and Vietnam and lead to a more coherent Chinese posture.

Reduction in societal resilience exacerbated by climate change impacts and natural disasters will increase the demand signal for U.S. humanitarian operations and disaster relief and recovery efforts. The U.S. military, led by the Navy, has a record of responding to every regional disaster at some level. For example, despite frosty relations, U.S. forces provided assistance to Myanmar after tropical cyclone Nargis in 2009, although the bulk of this assistance was refused.³⁹

The U.S. military is cooperating with regional military organizations on risk reduction activities to prepare for and adapt to the worst effects of climate change. Military-to-military cooperation is facilitated by epistemic factors. These include common characteristics such as terminologies, strategic planning cultures and common capabilities including rapid deployment and heavy lift capacity. Trust built by cooperation around these issues can carry over into discussions over other more intractable issues. For example, cooperation between the U.S. and South East Asian nations on counternarcotics have been problematic but maritime cooperation in other areas could form the basis of more productive discussions.

Disaster risk reduction and emergency response preparation arguably fit more clearly into the mission set of a civilian agency. The U.S. Federal Emergency Management Agency (FEMA) has established bilateral agreements with some countries in the region. Currently, these activities are limited to technical exchanges because FEMA lacks the authority to actually conduct ground operations overseas. Expanding these authorities would be a step in the right direction.

Conclusion

The physical and economic impacts of climate change on Vietnam's fisheries are significant and consequential. These impacts may have second-order implications for conflict at the international and local levels.

It is in the strategic interest of the U.S. to forestall such conflict and build resilience of this key regional ally. Accordingly, under a broad a broad strategy, U.S. military presence in South East Asia should be complemented by financial support for current and prospective allies. In 2009 the U.S. committed to mobilize US \$100 billion by 2020 along with private-sector partners. Less than half of this funding, referred to as "climate finance", is obligated for climate adaptation and risk reduction activities, as opposed to mitigation projects. U.S. emphasis on adaptation and risk reduction in the Asia-Pacific could stimulate greater financial commitments from other donor countries and leverage existing Vietnamese funding. In partnership with Vietnamese authorities, the U.S. has several means at its disposal to successfully address the impacts of climate change on capture and aquaculture fisheries.

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CLIMATE CHANGE, MIGRATION, AND RESILIENCY IN SOUTH ASIA: COOPERATION FOR CLIMATE SECURITY

Arpita Bhattacharyya and Michael Werz
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Climate change is not a future challenge – it is happening today. This March, U.S. Ambassador to India Rich Verma underlined this point in a speech in Kolkata. Verma warned that India and Bangladesh are already feeling the impacts of climate change, mentioning the 2014 flooding in Jammu and Kashmir, along with floods in Uttarakhand in 2013 and Assam in 2012, which displaced 1.5 million people. “This intersection of climate change, human migration, and governance will present novel challenges for South Asia in the decades to come,” he argued.¹

Last year, the UN Intergovernmental Panel on Climate Change (IPCC) report on “Impacts, Adaptation, and Vulnerability” made clear that the impacts of a warmer climate will intensify in the coming decades. Asia is experiencing more extreme temperatures and shifts in precipitation due to climate change, contributing to water scarcity and declining food production in many areas. The IPCC report also projects that climate change will exacerbate existing pressure on natural resources and environmental degradation occurring in Asian cities already straining to accommodate rapid urbanization, industrialization, and economic development.² A recent report by the Asian Development Bank estimates that South Asia risks losing almost 2 percent from annual gross domestic product by 2050 if fossil-fuel intensive energy consumption goes unchecked.

Addressing the challenge of climate change will be central to ensuring a prosperous and stable Asia in the decades to come. In a speech to the Australian Parliament in November of 2011, President Obama described the U.S. as a Pacific nation, promising that his administration “will play a larger and long-term role in shaping this region and its future.”³ A few data points illustrate the region’s importance: The 21 Pacific Rim countries of the Asia-Pacific Economic Cooperation (APEC) account for approximately 40 percent of the world’s population, over half of world GDP, and more than 40 percent of world trade. As the IPCC reports, climate change has the potential to greatly impact the livelihoods of this population and its economic productivity. As the United State shifts

its strategic focus to the Asia-Pacific, responding to climate impacts in the region will be key to its development, security, and diplomatic goals.

In particular, South Asia can serve as a case study for the challenges facing the entire region. Higher temperatures, more extreme weather, rising sea levels, increasing cyclonic activity in the Bay of Bengal and the Arabian Sea, and floods in the region's complex river systems will complicate existing development and poverty reduction initiatives. Non-traditional security issues including food, water, energy, and urbanization are at the core of the challenges facing governments and societies in South Asia. Existing tensions along the India-Bangladesh border could present more traditional security challenges if climate change impacts such as floods and storms change or are perceived to change migration patterns across the border. Understanding these scenarios will be vital as the U.S. builds relationships in the Asia-Pacific and integrates climate change across its development, diplomacy, and defense institutions.

Climate Change, Agriculture, and Urbanization

Roughly 2.2 billion people in the Asia-Pacific rely on agriculture for their livelihoods.⁴ Changes in precipitation patterns, more frequent droughts, and the flooding of agriculture lands in this region can therefore seriously undermine basic economic and livelihood security in the region.

India is a prime example, with 70 percent of the population directly or indirectly dependent on farming for their livelihoods.⁵ Farming makes up nearly 15 percent of the country's \$1.83 trillion GDP, making drought a huge threat to the overall economy.⁶ And the country is vulnerable; the Indian Space Research Organization found that 68 percent of India is prone to droughts, with one-third categorized as "chronically drought prone."⁷

As climate change continues, India's 1.2 billion people face more frequent droughts, floods, more intense heat waves, sea level rise, and stronger cyclones and storm surges.⁸ The impacts of climate change could influence existing patterns of internal seasonal and permanent migration. Events in recent years brought the prospect of short- and long-term displacement caused by natural events into stark relief.

In August 2012, the country was in the midst of its second drought in four years, with rainfall 20 percent below average nationwide and 70 percent below average in states like Punjab.⁹ Many experts believe the drought was a factor in the July, 2012 blackout that left over 600 million without power. Low rainfall led farmers to irrigate crops with water pumps, drawing more electricity from the grid than usual.¹⁰

Considering these factors, 2013's monsoon coming one month ahead of schedule was welcome news in parched areas across India.¹¹ But subsequent flooding left over 71,000 pilgrims stranded in

the state of Uttarakhand, and thousands of others displaced or missing across the region. Dozens of buildings and bridges collapsed in the floods and landslides stranded hundreds. Over 5,700 people were missing and later presumed dead, adding to a certain death toll of 600.¹² A month later in August 2013, floods in Maharashtra killed 20 and displaced 28,000 families, destroying about 50 percent of the crops across 150,000 hectares. The following month, floods in Bihar killed 201 and displaced 6.9 million people.

This drumbeat of extreme weather events fits existing climate change projections, which predict drastic weather shifts between intense drought and intense rain, destroying crops and undermining rural livelihoods.¹³ Displacement from sudden-onset events (flooding, cyclones, and storm surges) can range from a couple of days to a couple of months or even years and result in substantial economic and social cost.

Over the long term, slow-onset climate impacts like changes in precipitation, sea level rise, and land erosion can be just as damaging. During the summer of 2012, drought in some areas of India led to lower crop yields,¹⁴ while excessive rain destroyed other produce.¹⁵ Unpredictable weather, crop failure, and debt led at least 240,000 farmers to take their lives between 1995 and 2009.¹⁶ In March 2014 freak hailstorms and rains destroyed millions of dollars' worth of winter crops in Maharashtra, and a farmers' advocacy group reported that 32 farmers committed suicide in relation to the hailstorms and the lack of prospects for long-term recovery.¹⁷

A resident of Bay town in Laguna, Philippines, pushes a makeshift raft loaded with wet rice in a flooded rice field. September 2009. [FLICKR / IRRI IMAGES](#)



These climate impacts are not occurring in a vacuum but are interacting with other fundamental social trends like urbanization and the shift away from agricultural production to other economic pursuits. Palagummi Sainath, the rural affairs editor for *The Hindu* and a leading expert on famine and hunger, ties the plight of Indian farmers to the increased urban population reported in the 2011 Census. Sainath argues the Census “speaks of another tragedy: the collapse of millions of livelihoods in agriculture and its related occupations ... the ongoing, despair-driven exodus that this sparked in the countryside.”¹⁸

Indeed, research in other parts of the world show that even low levels of warming may be driving rural workers in the agriculture sector to urban cities. The IPCC cites research in Brazil that concludes that “dryland Brazil urban migration is very likely due to agricultural income loss.”¹⁹ More research is needed to understand the reasons behind India’s migration trends but analyses reveal that rural-urban migration trends in India are changing and increasing overall. For the first time since 1921, the urban population in India grew more rapidly than the rural population. The share of urban population growth caused by natural increase (i.e. births) decreased from 57.6 percent from 1991-2001 to 44 percent from 2001-2011; other factors, including migration, are contributing more to the growth of urban populations.²⁰ Migration in search of employment is also on the rise. As climate change impacts industries like agriculture, fishing, and tourism, many traditional rural livelihoods are threatened, potentially shifting the search for economic opportunity to new parts of India and other countries in the region.

Large population growth in suburbs, non-metro urban areas, and other peripheral areas has made it more difficult to determine the real impact of urbanization. Due to stringent regulations and expensive housing and transit costs, the World Bank finds that many of India’s urban poor are forced to live in suburban and peripheral metropolitan communities. Even there, poor migrants may be “forced to live in slums if they cannot afford the formal housing market or cannot access cheaper land and housing on the outskirts of cities because of unreliable and unaffordable urban transport.”²¹ These areas are not counted in tallies of the metro urban area, leading to potential undercounting of urban growth, which can impact policy planning and resource distribution.²²

The Urbanization Challenge

Looking ahead, projections by McKinsey’s Global Institute show that India’s urban population will grow from 340 million to 590 million over the next 20 years.²³ This dramatic demographic change—and the social opportunities and challenges that it presents—must be considered in the policy debate about climate change, migration, and security in the region. Existing megacities like Kolkata, Mumbai, and Delhi will need to continue strengthening their infrastructure while also building up the suburban and peripheral metropolitan areas in ways that promote inclusive growth. For example, no major city in India provides the majority of its population with continuous water supplies; in contrast, access in Jakarta is 90 percent, in Manila 88 percent, and in Colombo 60

percent. In the seven largest Indian metropolitan areas, 93 percent of households in the urban core have access to drainage but 5 kilometers (or 3 miles) outside the core, the proportion falls to 70 percent.²⁴

Importantly, these cities will have to prepare for climate change while simultaneously accommodating a larger population. Cities like Kolkata, Mumbai and Chennai are at high risk of sea level rise, prolonged cyclonic activity, and saltwater intrusion. Migration is often seen as a mode of adaptation to climate change, but the specific context of India's varied climate vulnerability could lead people from one difficult environment to another, either permanently or on circular migration pathways.²⁵

Urbanization also poses new resource challenges; studies of future demand may underestimate energy needs, not accounting for higher levels of urbanization and development. The greater the pressure on government, the likelier actors will resort to fossil fuel resources as a quick fix to meet shortfalls. In India this will be coal, as the country has one of the largest reserves in the world. The World Resources Institute found 455 proposed new coal-fired power plants in India, with an installed capacity of 519,396 MW.²⁶ For India's coal-rich northeastern states, the development of massive coal and hydropower resources has the potential to accelerate economic growth in the entire region. Coal revenue, in turn, will allow for accelerated industrialization, fostered by access to cheap electricity in a historically neglected region.

This is not good news, however, for air pollution. According to the Environmental Performance Index out of Yale University, India's air pollution ranks 174th out of the 178 countries ranked. The World Bank reports that air pollution causes more than 116,000 deaths annually and costs the country \$18 billion annually in shortened life spans of productive urban workers.²⁷ As in the United States during the industrial revolution, unregulated industrialization is taking its toll on lives and economic productivity.

India's development of sustainable energy and climate policies is important not only for the country's own sake. If it manages to cope with the twofold test of high population growth and urbanization, the subcontinent could provide a reference point for many developing nations whose growth models will more closely resemble India's than that of the United States or Germany. Fostering sustainable urbanization that takes climate change into account will provide an opportunity for India to lead the construction of modern urban centers.

Other countries in the region face similar challenges. In Bangladesh, the United Nations estimates that the urban population will more than double to over 100 million by 2050.²⁸

By 2020, two-thirds of the member states of the Association of South East Asian Nations (ASEAN) will reside in only five Mega-Urban-Regions (MUR) - Bangkok, Kuala Lumpur-Klang, Singapore, Manila, and Java.²⁹ The Asian Development Bank estimates that "ASEAN's infrastructure needs

are estimated at \$60 billion a year from 2010-2020 and this is in addition to national projects with significant cross-border impacts such as airports, seaports, and roads to borders.”³⁰ The ASEAN countries have diverse economies, but their high population densities, coastal areas, natural resources, and rich biodiversity will face vulnerabilities to extreme weather and climate impacts similar to those of India and Bangladesh. Ensuring the strength of the Asia-Pacific as a whole will require understanding of the livelihood security issues brought on by extreme weather events, sea level rise, and changes in temperature and precipitation. This field offers unprecedented scope for U.S. cooperation at the local and regional level.



A crowd waiting for a train at Thane railway station in India. December 2012. WIKIMEDIA COMMONS / DHARMADHYAKSHA

Migration and Security

In Bangladesh, the potential for major migration shifts due to climate change impacts is well known to its leadership. At the third Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Summit in March 2014, Bangladeshi Prime Minister Sheikh

Hasina urged countries “to mobilize collective efforts to monitor, and take a unified stand to seriously consider the adverse impacts of climate change.” She went on to warn that a one degree Celsius rise in global temperature due to climate change would submerge a fifth of Bangladesh, forcing 30 million people to become “climate migrants.”

Numerous studies warn of the potential for mass displacement and migration due to increased frequency of extreme weather events and long-term changes in livelihoods due to drought, sea level rise, and salt intrusion. The IPCC concludes that “climate change will have significant impacts on forms of migration that compromise human security.”³¹ To examine these challenges, the Center for American Progress (CAP) began a project examining the nexus of climate change, migration, and security.³² The project does not assert a simple causal relationship between climate change, migration, and conflict but rather aims to understand the way in which these trends can overlap to increase stress on populations and governments. In December 2012, CAP released a report on South Asia, following studies examining these stressors in other key regions: Northwest Africa, India and Bangladesh, Andean and Amazonian Latin America, and China.

The CAP report on South Asia brought the risks and opportunities into stark relief, providing a test case in how climate impacts, migration, and security concerns can overlap in potentially destabilizing ways. The Brahmaputra River that runs from the Indian border state Assam to Bangladesh will likely see more frequent flooding, impacting agriculture and livelihoods on the border and potentially displacing people more frequently. The IPCC reports that in the aftermath of extreme weather events, temporary displacement and reconstruction can lead to a perceived increase in migration.³³ Perceived and actual changes in Bangladeshi migration across the India-Bangladesh border has caused conflict in the past and could therefore be a potential tension point as climate change worsens. The issue of unauthorized Bangladeshi immigration has been a prominent political and social issue in Assam since the partition of India but has more acutely impacted local and regional politics in recent decades. In 1979 a group called the All Assam Students’ Union began a campaign against unauthorized Bangladeshi immigrants in Assam, who they believed were changing the state’s demographics and gaining political influence. The All Assam Students’ Union demanded that the names of unauthorized immigrants be taken off the electoral rolls before the next election. The campaign led to violence across the state, with Bengali-speaking Muslims indiscriminately targeted as illegal Bangladeshis. On February 18, 1983, fighting broke out in the district of Nellie between villagers and those seen as unauthorized immigrants, with an estimated 2,000 people – mostly Muslims – killed.³⁴ The massacre led to wide condemnation and forced the government to enact new immigration policies to quell tensions.

Violence over migration has continued on a small scale in Assam since then, but tensions boiled over in August of 2012, when members of the Bodo tribe and the Muslim community clashed over the building of a mosque. The clashes resulted in close to 100 deaths and the displacement of over 400,000 people, who fled to relief camps in the area.³⁵ As the conflict escalated, members of the Bodo tribe and certain politicians began to blame the incident on the increasing number

of unauthorized Bangladeshis in the region.³⁶ In the following days, rumors spread that Muslim groups were planning attacks on Assamese residents living in other parts of India, particularly in the southern cities of Bangalore and Chennai. Thousands of people native to the Northeast Indian region boarded overflowing buses and returned to the region. In the days following the conflict, many in Assam resorted to public demonstration and protests against proposals demanding the identification and deportation of unauthorized immigrants from Bangladesh, similar to the fervor during the 1980s Assam movement.

The actual numbers of unauthorized immigrants in the region are disputed and very difficult to track down. The situation in Assam reveals, however, the potential for even perceived unauthorized immigration to stoke tensions. As the region faces more frequent flooding, drought, and extreme weather events, it will be vitally important to understand the social and economic tensions that temporary and long-term displacement can have in border regions. It is also a signal to the U.S. to shift its thinking about security in the region to a comprehensive strategy that integrates climate change into its defense, diplomacy, and development goals.

Moving Forward

The United States has the opportunity work with countries in the region to jointly address the challenges of climate change, including migration and displacement. Hurricane Sandy, record-breaking droughts, heat waves, and extreme weather have shown that the impacts of climate change are a globally shared burden. In 2014 alone, the U.S. had 60 presidential major disaster declarations from extreme weather linked to climate change, including nine events that each inflicted \$1 billion in damage.³⁷ U.S. cities like New York and Miami face extreme weather in ways that are similar to those of Asian megacities such as Dhaka, Mumbai, and Manila. Drought-stricken farmers in California and Maharashtra may have much to learn from each other. Bringing together lessons and smart strategies from both sides of the Pacific on climate impacts should be a centerpiece of the U.S. strategy in the region.

The State Department, USAID, and Pacific Command have already begun integrating climate change into its strategies. Commander of the U.S. Pacific Command Admiral Samuel J. Locklear III identified climate change as the biggest security threat to the region's security.³⁸ Addressing climate as a security threat will require an innovative approach involving long-term development strategy, disaster relief, and climate resilience capacity building.

For this approach to be effective, more research and resources are needed to understand how climate change will impact economies in the region and tensions along borders, both internal and external. The case of Assam provides a snapshot of the immigration issues facing the region. The potential exists for an informed policy conversation about climate-driven challenges and conflict,

and how they relate to common global interests. This debate must extend beyond policymakers to include representatives from think tanks, civil society, and academia. Climate impacts and related displacement will increasingly uncover the importance of domestic politics and popular diplomatic engagement with emerging democratic powers.

The United States has, however tenuously, recognized and attempted to address this transformation, as evidenced by President Obama's outreach to Asian partners and his speeches in Cairo, Ankara, and Rio de Janeiro. For the United States this is an opportunity to build new strategic relationships and reshape the international system to face the challenges of the coming decades.

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ENVIRONMENTAL INSTABILITY, CLIMATE CHANGE AND CHINESE SECURITY

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China's environment will present a major security challenge in the 21st century. The physical landscape, affected by climate, pollution, population and development, will drive the nation's, and indirectly Asia's, viability, volatility and vulnerability in an era of climate change and increasing globalization. The country's water supply, arable land, livestock production and food supply are challenged by scarcity, contamination, desertification, urbanization, competition for resources and governance based on fiat rather than fact. This matters because of China's economic might, consumption of resources, borders with fourteen countries and conflict with East Asian neighbours, particularly Japan. China's actions will have regional implications and are likely to redefine U.S. roles and relationships in the Asia-Pacific sphere.

Climate and environments are intricately linked as both depend on geography.¹ This is particularly relevant in China; it is Asia's largest dryland country, most populous nation and the source of major rivers serving two billion people.² When climate varies, drought, floods and extreme temperature events occur;³ anthropogenic impacts manipulate the environment and affect human exposure with changes in consumption, pollution, degradation and development transforming productivity, natural resources, adaptation and social stability. Security in China will be determined by a combination of these social and environmental forces. Evolving domestic pressures will affect international dynamics and geopolitics, challenge longstanding U.S. preconceptions and present security implication that reverberate throughout Asia and the world.

“Man's ability to change Nature is unlimited.” - Mao Tse Tung

The first task is to accord China its unique perspective and its approach that both engages with

the international community yet chooses to maintain distance, and apartness, based on China-centric themes and premises.⁴ Inherent cultural values, including nationalism and Confucian-style reverence of elders, and thus authority, are emphasized by the ruling Communist Party. Whilst emperors and dynasties were past ruling paradigms, a one-party state is not novel nor a necessary prerequisite for governance. The non-democratic political system's survival requires a high level of unquestioned public support, or at least acquiescence. This has become the Communist Party's main focus – the system is set up to perpetuate the ruling elite, the world's richest plutocracy. Social stability, and the system that perpetuates it, including economics and the environment, is paramount as the main, perhaps only, check on the government's absolute power. In the hierarchical bureaucracy the deal is economic growth, greater consumption and perceived increase in wealth, or reduction in poverty, for the public in exchange for enduring state control at multiple levels.

Against this background the physical world is a secondary player, important only in how it can contribute to stated objectives, or in how the environment acts to the detriment of the government. The ethos is to produce and take advantage of nature to satisfy immediate goals, disregarding future costs and implications. Climate exacerbates natural conditions: when the weather is benign all is well, but too often climate disrupts plans and causes headaches for the government. Floods, droughts, landslides, heatwaves and extreme cold have resulted in great economic damage and millions of deaths in China in the last century.⁵ The direct concern is in how climate change, fluctuations or hydro-meteorological events upset a highly regimented, densely populated system.

Climate

China's location places the country at the confluence centre of several climatic forces and geographical realities. It is Asia's largest dryland country as deserts and semi-deserts cover 4.7 million km², more than 52 percent of the territory, an extent second only to Australia. This exacerbates water supply, reduces agricultural yield, intensifies the impact of degradation, restricts productivity and limits habitable land. The northern China plains are home to 60 percent of the nation's agricultural harvest yet have just 12 percent of the water resources. Similarly, central, south and eastern China includes temperate, tropical and humid regions where floods rather than droughts are major climate events. Monsoons, storms from the Pacific and El Niño events threaten households and communities (and consequently social stability and thus the Communist Party). Within the vast range of landscapes and climates, maintaining adequate livelihoods is critical for 1.3 billion residents.

In China El Niño, La Niña and East Asian summer monsoons contribute to climate uncertainty. Seasonal harvest fluctuation rates of about 15 percent annually have been identified in central China with El Niño events intensifying drought/flood patterns.⁶ Winter droughts in northern

China are also influenced by La Niña conditions where temperature differences and atmospheric pressure between the continent and Indo-Pacific Oceans affect the East Asian winter monsoon flow. In 2008 and 2009 a southward shift of the Intertropical Convergence Zone reduced wet and warm flow to northern China and contributed to drought north of the Yangtze River valley.⁷ A strong East Asian Winter Monsoon can lead to cold surges, drops in air temperature and often precipitation decreases whilst warming in the Pacific contributes to weakened summer monsoons that lead to drier conditions in East China.⁸

Water

The relationship between water, climate and humans is the basis of civilization. The Babylonians, Nabateans, Angkor Wat and Anasazi cultures rose and fell with changing climate and water regimes. In China water may well be the crucible in which the Communist Party and society are tested. Nationally, China has one-third the water availability per capita of the global average; in Beijing this falls to 120 m³ per person annually, one-quarter of the United Nation's level for 'absolute water scarcity'. The capital has a water shortfall of 1.5 billion m³ per year (about 400 billion gallons).⁹ Location and natural distribution of water resources are unequal and concentrated in the south; though the Tibetan plateau (aka Asia's Water Tower) is the source of the Indus, Ganges, Brahmaputra, Irrawaddy, Salween and Mekong rivers, the water flows to neighbouring countries.¹⁰ The Yangtze and Yellow rivers are the main surface water sources and are heavily exploited, some years not reaching the ocean.¹¹ Much of the water for rapid urbanization, irrigation and industry comes from groundwater that is often not renewable; Beijing's water table falls 2 to 3 meters per year. Human distribution of water is telling – one-sixth of all water in China is used in coal extraction for power generation.

Changing climate patterns directly impact water resources through precipitation, seasonality, evapotranspiration and fluctuation over time. This includes surplus (floods), scarcity (drought), intensity and volatility (use/availability of water, disaster episodes) and change in resources (glacial melt, springs, river courses). Natural capacity and conditions are exacerbated by human action – where cities are situated; how water is allocated (i.e. water flows to money); and evolving work, food and lifestyle choices. Thus changes in global weather patterns, changes in demand or use, and changing social dynamics (urbanization, food consumption patterns, aging population) all have potentially significant impacts in China, as part of the rapid development decisions are based on immediate factors – housing, jobs, transport – rather than longer-term climate patterns and consideration of environmental implications.

Pollution and Degradation

No responsible discussion on the Chinese environment can ignore pollution and degradation. This is a multi-headed hydra in China with seemingly no end. The obvious starting point is air pollution in Beijing that is so poor as to be “unindexable” with pollutant particulates of 755 on the United Nation’s 500-point scale.¹² Equally, it could be that 70 percent of northern Chinese water sources are undrinkable; the 16,000 dead pigs contaminating the Shanghai water supply in 2013; the excessive pollution-related mortality rate in Guangzhou; and smog in Harbin that closed schools and airports and made it impossible to drive buses.¹³ The topic moves on to food safety, from the well-known contaminated baby milk to carcinogens, exploding watermelons and agrochemicals in the food supply and water — the South-to-North water canal project’s first delivery was too polluted to drink and 300 million Chinese drink contaminated water every day.^{14 15} The essence is that industrial development at all costs, economic growth, expanding consumption and a lack of transparency in governance have led to severe environmental consequences across China.

Each case, each example becomes a threat multiplier where a change in circumstances, inadequate rainfall, unexpected frost, a polluted water source or disappearing glaciers have potentially significant consequences. The damage may be domestic, as with an extreme cold and ice disaster in 2008, drought in the southwest in 2009 and flooding in Yunnan in 2010, or have international ramifications as was the case with the 2011 drought.¹⁶ Similar conditions are found with land, water and resource degradation and desertification, which now affect 2.62 million km², 27 percent of China’s territory.¹⁷ Consider the limits of productive land, that half of the country are drylands, the population pressure, the high water demand for industry and agriculture – where will the water and physical resources come from to limit degradation, much less ameliorate environmental conditions. Again, decisions based on political exigencies (power, control) can have detrimental consequences in both rural and urban environments.

Smog in Beijing at high humidity and temperature. August 2006. [WIKIMEDIA COMMONS / BERSERKERUS](#)



Greater Implications – Security, the U.S. and the Future

The short tour through the Chinese climate and environment serves to frame discussion on the impending security role of China. Like all countries, China's security perspective is based on nation concerns and perceptions. Today the lens is that of the Communist Party with their stated goal of social stability through development and the unstated goal of maintaining state control.¹⁸ Thus security concerns are as likely to be driven by the domestic audience, even pandering to it, as they are by a perceived external threat: note that the internal security budget is greater than the external.¹⁹ The ongoing Diaoyu/Senkaku Islands conflict may appear to be an international conflict yet could equally reflect the government's portrayal of Japan as the eternal enemy and their action as a show of national strength. This is also a distraction from water, food, education, corruption, inequality and similar pressing concerns. Should a slowing economy, job losses or climate disaster lead to civil protest or unrest, foreign encounters could increase.

The U.S. has its own powerful domestic audience that often sees China as a threat. Action taken vis-à-vis an ally – Japan, Korea or Taiwan – may trigger responses based on domestic perceptions and fears. New threats abound – China's interest in the Arctic region, business and resource extraction in Africa, competition for energy, transborder water and pollution issues are on the table. Plans to divert the Brahmaputra to the Yangtze has infuriated India, as physical modifications to the Mekong have upset downstream nations, whilst discussion for a water pipeline from Lake Baikal, Russia is less controversial. Such events may be driven by the very real need for resources for a vast society but can equally be construed as threats to the global status quo that serves the U.S.'s perceived interests and role in Asia. China's expanded military investment and capacity will necessitate re-evaluation of America's role in the Asian-Pacific region. Recent events in Crimea show the security limits of western alliances and may persuade China that for all the words, security is most important at home. After wars in Afghanistan and Iraq, and political change in the Middle East and Crimea, the U.S. may conclude the same.

The question will be both how actions are framed by the Chinese, and how they are interpreted by the global community. The role of climate and the environment is a cause and instigator of shifting internal Chinese dynamics. Climate change, lack of water for agriculture and drinking, a failed harvest or polluted environment can spur mass action as evidenced in numerous local protests. The Communist Party has paid attention to the disintegration of the Soviet Union and the Arab uprisings. Are they prepared for security challenges created by the "Chinese characteristics" of a damaged environment in an era of climate change? Asia and the world await the outcome.

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CLIMATE CHANGE, MIGRATION AND A SECURITY FRAMEWORK FOR THE U.S. ASIA-PACIFIC REBALANCE

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As the United States pivots its security focus to the Pacific, it is beginning to recognize that the impacts of climate change present a growing range of security challenges. In his 2013 Posture hearing before the House Armed Services Committee, the Commander of the U.S. Pacific Command (PACOM), Admiral Samuel J. Locklear III, said:

While the Indo-Asia-Pacific today is at relative peace, I am concerned by a number of security challenges that have the possibility to impact the security environment. Examples include: Climate change - where increasingly severe weather patterns and rising sea levels along with inevitable earthquakes and tsunamis / super typhoons and massive flooding will threaten populations.¹

As they consider a range of security concerns caused by climate change, PACOM planners must prepare for climate-induced migration on an unprecedented scale. In Bangladesh alone, the government is anticipating the forced displacement of millions of citizens currently living in low-lying areas, without climate change mitigation.²

In analyzing the security concerns associated with climate-induced migration in Asia, planners must determine whether migration is a threat, a successful means of adaptation, or both. In 2001 the Intergovernmental Panel on Climate Change (IPCC) indicated that "...increases in the frequency and intensity of severe weather systems as a consequence of climate change can trigger mass migration... Land loss in coastal areas resulting from inundation from sea level rise as a result of climate change is likely to lead to increased displacement of resident populations...". It further warned that "...perceptions of regional/national identity, language/cultural differences, and fears of unemployment may contribute to increased hostilities between immigrants and nationals in years

to come.”³ In 2014, the IPCC adopted a more positive approach: “Forced migration can result from adaptation options such as construction of dams, but the negative outcomes could be allayed by putting proper safeguards in place. Managed retreat of coastal communities is a suggested option to address projected sea level rise.”⁴ It is accommodating this duality of migration that presents security planners a noteworthy challenge.

While migration can be an acceptable and often beneficial response to a changing environment, security experts warn that mass migration has serious security risks. Mass migration can overrun existing social systems; result in exploitation of migrants; and in the extreme, result in conflict as cultures clash or nations take actions to forcibly prevent entry or settlement of refugees. As part of its rebalance and establishing a new security posture in Asia, the United States must work closely with partner nations and take a proactive approach to finding acceptable solutions to inevitable climate change induced migration.

Although climate-induced migration will likely occur across Asia, we chose to focus on South and Southeast Asia. This area was selected because of its vulnerabilities to the predicted effects of climate and its expanding ties to the United States. We recognize that South and Southeast Asia are vast areas comprised of diverse ecosystems, economies, and cultures, and any attempt to characterize it as a single body or even as a common population does a disservice to the unique cultural, national, religious, and governance systems that compose the region. Nonetheless, for the purposes of this essay, we define “South and Southeast Asia” as a designation of Asian countries that stretch along the southern coast of the Asian continent from India to Vietnam and the island nations that stretch from Tahiti in the east to the Maldives in the west.

Sea level rise as a Driver of Migration in South and Southeast Asia

Even if the world takes immediate action to reduce greenhouse gas emissions, climatologists predict the temperature of the earth will increase by a minimum of one to two degrees Celsius over the next 50 to 80 years.⁵ Increases in the earth’s temperature and the resultant climate change will raise ocean temperatures, accelerate glacial melting, and change precipitation patterns. The rise in ocean temperature and melting of glaciers will cause a predicted rise in sea level of between 17 and 29 inches by the end of the century.⁶ Without adaptation, this rise will likely cause a sizeable loss of land along the coasts of Asia and saltwater intrusion into low-lying coastal areas and deltas.⁷

In South and Southeast Asia, sea level rise and increased storm intensity will threaten the low-lying coastal areas and small islands, especially the Maldives, Kiribati, and Fiji.⁸ In many areas of South and Southeast Asia the rise in local relative sea level will be greater than the global average because the major deltas in the region, like the Mekong Delta in Vietnam and the Ganges–Brahmaputra Delta that makes up much of the coast of Bangladesh, are sinking as the result of natural geological progression.⁹



U.S. service members help clean after a Thailand flooding. November 2011. Flickr / USNAVY

The main impacts of relative sea level rise include: repeated or persistent flooding of homes and agricultural lands; flooding of critical infrastructure; and salinity ingress causing the rivers, deltas and aquifers in the coastal belt to become brackish or saline. The introduction of brackish or saline conditions can be accelerated by reduced river flows and lowered aquifers caused by climate change induced variations in precipitation, such as lower rain falls, droughts, and the installation of dams and increased fresh water demands by expanding populations. These conditions can already be seen in both the Mekong and the Ganges–Brahmaputra .¹⁰

Rising sea level impact on land, food, and fresh water in South and Southeast Asia will likely affect tens of millions of people who currently live and work in the low-lying areas. In some areas, where in place adaptation is not possible or ineffective, the people of South and Southeast Asia will be forced to migrate because their homes will become uninhabitable or their livelihoods destroyed by the rising sea, or because they will suffer from severe fresh water shortages as rivers, delta and estuaries become brackish and aquifers saline. In other areas, where possible and affordable, the people of South and Southeast Asia affected by sea level rise will adapt to the changing environment in place, either through government or community adaptation.

One such attempt at adaptation is in Bangladesh, where over 7,500 km of the coast is now protected from the sea and storms by 4 to 5 meter high dykes, forming polders where people can live and

work. However, as climate change causes the rain and cyclone intensity to increase and the sea water level rises, these polders will be more prone to flooding and water removal will become more challenging and more expensive. The government of Bangladesh already assesses that these earthen barriers are in urgent need of repair and in their current conditions will not protect the land or population from storm surge or future climate change.¹¹ And, it is not just farmland which is threatened by the rising sea. The 2014 IPCC report finds that Asia has most of the top 20 cities for population and asset exposure from coastal flooding - many of which are in South and Southeast Asia including Kolkata, Mumbai, Dhaka, Ho Chi Minh City, Bangkok, Rangoon, and Hai Phòng.¹²

When in place adaptation is not possible or the adaptation ineffective, the people of South and Southeast Asia affected by sea level rise will migrate.

Migration as an Adaptation or a Security Risk

Since the beginning of civilization, populations have migrated in response to environmental stresses and for better opportunities. Decisions to migrate are influenced by a combination of drivers and constraints that may be political, economic, environmental, sociocultural, or demographic.

In Southeast and South Asia, as in the rest of the world, successful migration is a function of the potential migrant's social capital, financial ability to migrate, and social networks. In both intra-Asia migration and cross-continent migration scenarios, family and social networks are influential in providing necessary economic support and in helping to determine the choice of destination. Self-forming social networks of migrants become embedded and grow in host nations or communities. The social networks often have unique or different cultures, may compete for limited resources or employment, and are often perceived as threats to the host communities. The clash of cultures is often the source of conflict.¹³

One of the most notable examples of migration in South Asia that has led to conflict is the large-scale migration of environmentally displaced Muslim Bangladeshis into Hindu-dominant India, beginning in the 1970s. The state of Assam in India was the first to experience conflict associated with a large population of illegal Bangladeshis, exacerbating tension over Indians of Bengali origin already living there. For over twenty years, the influx of Bangladeshis resulted in local governmental instability, sustained civil disobedience campaigns and ethnic violence throughout Assam.¹⁴ As recently as 2014, India's Army Chief Bikram Singh spoke of this migration as being a threat to Indian national security.¹⁵ Narendra Modi, when campaigning to be India's next prime minister, threatened deportation of illegal Bangladeshis in West Bengal: "You can write it down. ... these Bangladeshis better be prepared with their bags packed."¹⁶

In amplification of the conflict manifested in India, the IPCC notes that “perceptions of regional/national identity, language/cultural differences, and fears of unemployment may contribute to increased hostilities between immigrants and nationals.” Moreover, there is the threat of exploitation of migrants, trafficking, empowering of illegitimate governments, health and safety concerns in refugee camps or urban slums, and even national level disputes over immigrants.¹⁷

Climate-Induced Migration and the Security Framework

While migration cannot be ruled a certainty in South and Southeast Asia, PACOM security experts must prudently explore a range of plausible migration scenarios and their associated security threats. However, planning for “migration” in broad terms is insufficient for both the security community and policy planners. There exists a range of migration including: temporary, short, cyclic, or permanent movements of people; voluntary in response to changes and pressures in surroundings over time, or involuntary as a result of environment displacement; legal, illegal or irregular, whereby a migrant changes status from illegal to legal, or vice versa. Each of these forms of migration holds its own security risks.

A model, in the form of a security framework, can provide clarity and a mechanism to compare varying security threats. Such a framework will help advance the security dialogue and aid PACOM policy planners in evaluating climate-induced migration in South and Southeast Asia.

Goff, Zarin and Goodman developed a migration framework to explore the security implications of climate-induced migration of Africans into Europe.¹⁸ This framework can be applied equally as well to explore climate-induced migration in South and Southeast Asia.

When evaluating uncertain security futures, security leaders often prepare for a range of scenarios. They build strategic and operational plans and size forces for the most likely and scenarios, while planning for the less demanding as “lesser-included cases.” They identify the risks associated with various future scenarios and national security leaders then make judgments about the levels of risk they are willing to accept.

As previously indicated, there are many different types of migration. The Goff, Zarin, Goodman model categorizes migration into three broad categories:

- Regular (legal) migration: migration that adheres to existing immigration laws.
- Irregular or illegal migration: migration that does not adhere to immigration laws.
- Involuntary migration: mass displacement, which can be caused by extreme weather events or conflict.

Applying these three distinct kinds of migration to South and Southeast Asia, a model can be used to explore security scenarios surrounding two potential magnitudes of migration:

- Those consistent with today’s trends.
- Those that are an order of magnitude (10x) higher.

Although models that can predict future migration patterns into South and Southeast Asia do not exist, the “security threats” that tend to be associated with migration can be broken down into four broad categories:

- Danger to international order.
- Danger to the government or institutions of the country that hosts the immigrants.
- Cross-cultural tension that could lead to ethnic conflict.
- Human threats to migrants or citizens of the host country.

Figure 1 is an illustrative example of how PACOM planners can apply the model and examine the security risks associated with international, inter-continental or even internal migration in South and Southeast Asia.

		Magnitude of Migration	
		Consistent with current levels as a percentage of population	x10 current rate as a percentage of total population
Type of Asian Migration	Controlled migration, within immigration laws. Prolonged period	Overall LOW SECURITY RISK <ul style="list-style-type: none"> • Ethnic tensions • Stress on social programs • Growing nationalism 	Overall LOW / MED SECURITY RISK <ul style="list-style-type: none"> • Ethnic tensions / conflict • Overstress social programs • High nationalism
	Illegal or irregular migration. Prolonged period	Overall LOW SECURITY RISK <ul style="list-style-type: none"> • Ethnic tensions • Human trafficking / Exploitation • Criminality / smuggling 	Overall MED / HIGH SECURITY RISK <ul style="list-style-type: none"> • Ethnic tensions • Low confidence in government • High criminality
	Mass displacement. Short period	Overall MEDIUM LOCAL RISK <ul style="list-style-type: none"> • Ethnic tensions • Overrun social programs • Human rights / environment 	Overall HIGH SECURITY RISK <ul style="list-style-type: none"> • Environmental crisis • Overrun social programs • Temporary shelter / encampment

Figure1: Future Asian Migration Security Framework

Figure 1 is only an example. When used to examine a specific migration pattern in South and Southeast Asia, the security risks identified in the framework should be informed by research on migration, conflict, and impacts to social systems, and should be more specifically identified by a broader group of government, intelligence, and security planners well versed in South and Southeast Asia policy, programs, and politics.

Most significantly, the illustrative framework shows how security risks vary across the six possible scenario combinations. It shows that none of the proposed types of migration pose a threat to international governance, and only a few pose a marginal threat to the internal governance. The threats identified in this framework are primarily to internal populations of destination countries and to the migrants. The majority of threats are manifested in cross-cultural conflicts, criminal activity, and population vulnerabilities; they are not existential threats.

As an example, the framework shows that if migration levels remain constant as a function of Asian population growth and migration is primarily legal, the associated risk is low. Security risks should be manageable at this level of migration. A similar analysis would ensue for each of the six scenarios.

From the security framework we can see that the highest security risks are associated with mass displacement over a short period of time. In a planning scenario with an anticipated high level of mass displacement, social programs would likely not be able to meet acute demand. Without the proper planning and resources needed to accommodate this level of displacement, a humanitarian crisis could ensue.

Using this framework, PACOM security planners can program resources to prepare and, if necessary, respond to identified potential threats and provide advice to partner nations on how to manage migration with the least amount of risk. Most importantly, the security framework identifies areas where policies can be targeted to reduce threats associated with each scenario. Other policies, such as mitigation and contingency adaptation can be targeted to completely avoid scenarios that pose the highest security threats.

Summary

As the United States rebalances to the Pacific, threats associated with climate change must be considered across the full spectrum of military operations from capacity building through response to conflict. Migration due to sea level rise will occur across the much of South and Southeast Asia, and the U.S. will likely be called upon to respond to crisis and conflict. How Washington and specifically PACOM navigates its relationships with strategic partners who may experience heightened conflict over migration with each other, such as India and Bangladesh, should be a pressing concern for policymakers.

By exploring the various forms of migration through a security framework, planners can evaluate whether migration can be an effective adaptation mechanism or a threat or conflict. The security framework shows that legal migration within set policy frameworks holds the lowest risk, even at higher orders of magnitude. Similarly the security framework shows how illegal or irregular migration has increased risk. Finally, the security framework can also show how failure to plan or

adapt might to a changing climate could lead to sudden onslaught of mass migration, which carries the greatest risk, not only for governments, but for migrants.

Working both bilaterally and through multinational organizations, the U.S. must apply sound migration principles, employ a migration security framework, and adopt best practices to find acceptable and perhaps even beneficial solutions to make migration a successful adaptation rather than a source of conflict and strife. PACOM should encourage partner countries to adopt sound migration policies to avoid the higher risk illegal or irregular migration scenario and should put in place contingency plans to limit the risk should mass migration result for catastrophic events.

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PATHWAYS FOR DEVELOPMENT

SHIFTING THE PARADIGM: CLIMATE-WISE DEVELOPMENT FOR HUMAN SECURITY

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Although the implications of climate change for traditional security concerns in Asia change are profound, as noted in other papers in this series, it is through the human security frame that the full complexity of the impact of climate change on this most populous region of the planet is revealed. The UN's 1994 Human Development Report defined the concept as follows:

“Human security can be said to have two aspects. It means, first, safety from chronic threats as hunger, disease, and repression. And second, it means protection from sudden and hurtful disruptions in the patterns of daily life—whether in homes, in jobs or in communities. Such threats can exist at all levels of income and development.”¹ Seen through the lens of human security, the chronic and sudden threats of climate change affect the well-being of vast numbers of individuals and communities throughout Asia. Indeed, in its November 2010 report the Asian Development Bank underscored climate change as a “key risk to economic development.” “[Climate change] impacts cumulatively could slow economic development, causing economic losses of \$230 billion or an equivalent of 6.7% of gross domestic product (GDP), each year by 2100—more than twice the global average loss of 2.6%—and endanger the livelihoods of millions of people.”² Loss of livelihoods, without policies in place to assist those affected, can precipitate “hurtful disruptions in the patterns of daily life,” whether it takes the form of vulnerability to disease, malnutrition, migration or instability.

While there is uncertainty about how climate change will impact any specific locale or population, there is little doubt that the current trajectory of accumulation of greenhouse gases in the atmosphere is already prompting societies to bring the anticipated impacts of climate change into their planning and policies.³ How can countries move to reduce the vulnerability of their populations to climate change harms and what role can the United States play in diminishing the consequent worldwide threats to human security? The cases of Vietnam and Myanmar, two

countries already confronting the baneful effects of climate change,⁴ will illustrate one possible direction for United States assistance policy.



Volunteers help the flood victims in Ayutthaya Province in Thailand. October 2011. WIKIMEDIA COMMONS / DONAVANIK

The human security frame brings into relief the interconnectivity of climate change effects and the admonishment, in making policy, to “first do no harm.” For example, building a sea wall to combat sea level rise could wipe out a natural spawning area for fish and thereby have an effect on the livelihood of a nearby fishing village. Coastal communities that lose fertile land to saline intrusion may see their people migrate to the cities and industrial parks in search of work, only to fall prey to disease due to crowding, heat waves, and insufficient provisions for clean water and hygiene. Dealing with climate change to assure human security requires a fully coordinated response across multiple ministries and agencies of government, as well as among local communities. In other words, awareness of climate change and the charge to integrate it into policy planning needs to be mainstreamed across government at the national, provincial and local levels. How can this be done?

The answer lies in a thoroughgoing commitment to building capacity in government agencies and local communities to imagine and implement measures that promote development and security in the context of a changing climate. It also requires building capacity among civil society leaders and the media to hold policymakers accountable for ensuring that decisions are taken with the broadest consultation possible, including space for contestation.

Investment in education at all levels is key, but what kind of education? As they engage the global economy, first Vietnam and now Myanmar face the challenge of adapting their educational systems and methods to prepare citizens for new responsibilities in rapidly transforming environments. Resilience requires not only understanding one's *responsibility* to contribute to addressing climate change on a personal level and in the community, but also one's *right* to a future that is not compromised by the inadequate decisions of those in authority.

Higher education in both countries suffers from the accumulated legacies of underinvestment due to colonial rule, war and civil conflict, isolation and authoritarianism. In Vietnam, the United States has taken an active interest in supporting higher education through Department of State-funded Fulbright fellowships, Vietnam Education Foundation fellowships, and USAID Higher Education for Development programs, as well as through private-sector initiatives with INTEL and other companies. Myanmar, once a regional leader in education, experienced a virtual dismantlement of higher education under the decades of military repression. USAID, through its Higher Education for Development program, the Department of State's Fulbright fellowships, and the Institute for International Education with its support for international exchanges are taking initial steps to fill the gaping need for improving higher education in Burma/Myanmar.⁵ Fundamental capacity to promote climate-wise development to ensure future well-being of populations will rest on the speed and breadth of these efforts. Investment in higher education exchange, as a cornerstone of U.S. diplomacy and development policy, should therefore be expanded for the long term.

Nevertheless, in both countries pressures for economic growth and delivery of "quick wins" proceed, while climate change concerns will only accelerate. Efforts to mainstream climate-wise development principles across government and through society also need to be fast-tracked. In Vietnam and Myanmar, George Washington University's Partnerships for International Strategies in Asia (PISA) led leadership institutes on climate change for government officials, university personnel and civil society leaders. These programs, held in 2008, 2009, and 2013, spotlighted a number of issues to navigate: 1) inadequate information-sharing across government agencies; 2) insufficient mechanisms for civil society organizations to influence policy-making; 3) lack of an integrated systems approach to decision-making; 4) the need for incentives to elicit and assimilate local knowledge; and, finally, 5) acknowledgement that climate-wise development is not merely the outcome of a technical assistance plan, but the product of democratic contestation among competing interests. Professional education programs that address these issues by creating opportunities to build cohorts across ministerial and departmental divides; offering opportunities for civil society actors to learn to brief policy makers with actionable information; providing the tools for systems analysis; promoting the value of eliciting information from local communities;

and nurturing widespread political participation can make a difference in the prospects for inclusive, sustainable development policies that are mindful of climate change impacts.

Whether by building capacity for climate-wise development through support for exchanges in higher education, or by promoting short-term professional development programs, the United States can exercise leadership in promoting climate-wise development for human security in Asia. An investment today in human capacity to adapt to a changing climate will reduce the need for costly operations in response to disasters and conflicts in the future.

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THE SECURITY BENEFITS OF EXPANDED TRADE IN ENERGY EFFICIENCY IN THE ASIA-PACIFIC REGION

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The United States is several years into the project of reorienting and intensifying its longstanding engagement with the Asia-Pacific region. This “rebalancing” will make the countries of the Asia-Pacific more prosperous and more secure. The region includes the world’s three largest economies (the United States, China and Japan) and accounts for 55% of global GDP and 44% of world trade.¹ Greater trade between the United States and Asian economies in technology that can increase energy efficiency has tremendous potential to enhance economic performance and economic security for all parties. It will also yield environmental and social stability dividends on both sides of the Pacific. However, trade in energy efficiency technology is currently hampered by a variety of factors. Also, its value is underappreciated in the broader strategy for U.S. economic rebalance. Expansion of trade in energy-efficient technologies should be considered a foundational goal of rebalance efforts and aggressively encouraged in Washington’s new look east.

This article examines the obstacles and opportunities for increasing the export of U.S. energy efficiency technologies to developing Asia. It lays out the economic, environmental and human security benefits of doing so, both for the U.S. and for partners in Asia.

The Economic Rebalance

In a 2011 *Foreign Policy* article on the Asia-Pacific, former Secretary of State Hillary Clinton pointed to the economic dynamism of the region as a key consideration in the rebalance.² The United States lags far behind dynamic, industrializing Asia-Pacific economies such as China, India, Indonesia and Vietnam in growth. The recent global economic slowdown has diminished their pace of economic expansion. However, gross domestic product (GDP) growth rates in developing

Asia still significantly outpaced that of the United States over the last decade. During this time GDP growth rates in developing Asia ranged from 6.5% to 11.5% while U.S. rates moved between -2.8% to 3.8%.³ U.S. policymakers seek greater investment in the Asia-Pacific, particularly its developing economies, as a core strategy for economic growth and security.

The Asia-Pacific region is already the top destination for U.S. exports, according to the U.S. Census Bureau. Direct investment between the United States and Asia is on the rise, with financial flows increasing by 81% over the last decade, according to the U.S. Bureau of Economic Analysis. U.S. investment in the region increased 17% to \$3.4 billion last year. However, that was far outpaced by the \$102.5 billion invested by the other top ten Asian economies. There is tremendous opportunity for the United States to expand investment in the region.

To increase trade with Asia-Pacific countries the United States is advocating for a more hospitable trade architecture in the region. This includes the removal of discrimination against American companies operating in Asia and greater intellectual property protection. Additionally, U.S. leaders are urging greater regulatory and customs alignment between the United States and other Asia-Pacific nations. With such reforms, the economies of this region will offer expanded opportunities for growth. To enhance the sustainability of such growth, the U.S. should aggressively expand trade in energy efficiency technologies. Increased renewable energy and climate change resiliency are laudable and related goals. However, U.S. policymakers should focus more explicitly on trade in energy efficiency technologies to deliver greater strategic benefits, and greater security, in the rebalance.

Focus on Energy Efficiency

Industrializing Asian economies, particularly China, have customarily performed poorly on energy efficiency. On average they require almost twice as much energy for each unit of economic growth than the economies of North America and Europe.⁴ Efficiency is improving; intensive energy use, however, remains a serious drag on economic growth.

Governments across developing Asia are crafting economic policy to help them shift from a reliance on cheap labor in a globalized manufacturing sector to higher-performing and more efficient development models. Such models can sustain levels of overall growth as populations in these developing economies become more affluent. Replacing people with machines is already underway. However when the machines themselves perform poorly on energy efficiency, the impact of investment in upgrades is limited.

Poor energy efficiency in Asia is a major contributor to the choking pollution levels that inhibit the quality of life the region's dash for economic expansion aims to achieve. Out of 230 Asian cities evaluated for particulate emissions using 2008 data, only two met existing World Health



Wind turbines in Guazhou County, China. May 2013. WIKIMEDIA COMMONS / POPOLON

Organization (WHO) Air Quality Guidelines.⁵ The average concentration in the air of particulate matter greater than 10 micrometers in size for all 230 cities was 4.5 times the WHO guidelines.⁶ Indian cities performed particularly poorly and Bangkok was cited in the group's scorecard for particularly poor air health performance.⁷ Such pollution is a mobilizer for increasingly educated and politicized urban populations to contest current economic management and some of the most degrading environmental practices.

In China, for example, pollution-related protests and activism are a concerning source of social unrest for state leaders. Government officials have closed some of the most pollution-intensive factories to address this concern.⁸ However a broad push to close pollution-intensive factories, or halt plans for new emissions-intensive coal power plants, is inconsistent with burgeoning economic growth.

Despite the challenges associated with increasing energy efficiency, Asian leaders are nevertheless prioritizing this goal. This will help them address the twin problems of movement up the "ladder of economic development" and leveraging investment to limit pollution growth.⁹ Success in these two domains will have a direct economic security benefit as well. It will expand economic resilience to withstand energy price spikes. It will offer more electricity supply reliability as inefficient and inconsistent equipment in the manufacturing sector, and in buildings, is replaced. Also, it will limit devastating environmental degradation, offering a more sustainable path for economic development and use of natural resources.¹⁰

Concerted programs to expand energy efficiency have shown sharp reductions in peak electric power demand usage and emissions. For example, a series of demand-side management programs implemented in California in 2001 succeeded in dropping peak demand use by 10% in less than a year.¹¹ This was accomplished through efficiency efforts such as consumer education and incentivizing less energy-intensive appliances and lighting, according to research from the U.S. Department of Energy's Lawrence Berkeley National Laboratory.¹²

Implementation of such programs may be replicable in various forms in developing Asia. China, for its part, is working aggressively to improve energy efficiency. China's 12th Five Year Plan (2011-

2015) includes original language on sustainable development, with energy-intensive investment identified as a top priority for the economy.¹³ One of the explicit goals of the latest Five Year Plan includes a 16% improvement in energy intensity per unit of GDP.¹⁴

Energy Efficiency Investments

It is difficult to quantify the existing degree of energy inefficiency in Asia and the volume of trade with foreign companies in technology to expand energy efficiency. Such data are obscured by a number of data quality issues and by currency controls on the renminbi. Additionally, restrictions on debt financing for international companies mean that foreign investment in Asian energy efficiency takes a more project-based, rather than broad-scale rollout, approach.

The Energy Transition Research Institute estimates that the market in China for investment projects related to energy efficiency, for example, was worth roughly \$20 billion in 2010, and could hit \$90 billion per year in 2020.¹⁵ In many cases, investment to date has been in replacing existing distributed generation infrastructure, like diesel generators, and upgrading factories that would otherwise be closed. However, building efficiency improvements, such as improved climate control and lighting, as well as planned upgrades to the transmission grid, will be part of the next generation of technology investments for energy efficiency.¹⁶

There is a great deal of anecdotal evidence for growing U.S.-Asian ties on large-scale projects to expand energy efficiency. For example, in what it calls a sign of its commitment to the region, GE Energy has located one of its four global research centers in Shanghai.¹⁷ In March 2013, GE Lighting installed energy-efficient signage on 400 storefronts in China owned by Hong Kong-based Watsons. This reduced energy consumption by roughly 67%.¹⁸ That is a significant project, and a sustained uptake of new financing models and use of international energy service company models (ESCOs) will see the proliferation of many more such projects.¹⁹ Changes in the law over the last decade that have encouraged the inclusion of international firms in Chinese ESCO financial models virtually assure this growth.²⁰

U.S. Technology Solutions for Asian Energy Inefficiency

With the price of labor rising across Asia, perhaps most significantly in the workhouse of the world along China's coast, investment in foreign-made equipment with much higher energy efficiency profiles is on the rise. Low labor costs have assured product competitiveness for many years, despite energy inefficiency. This economic growth model of export-oriented labor-intensive manufacturing requires modification as the costs of labor rise. Increasing the energy efficiency of production, from the very low current levels, is a clear way to maintain competitiveness.

Developing Asian economies are turning to foreign producers of higher-performing energy efficient technology to solve some of their productivity and environmental degradation problems. New gas turbine technology developed by foreign companies, for example has made a notable increase in developing Asian economic efficiency.²¹ But most foreign technology designed to increase Asian economic efficiency has focused on equipment upgrades at power utilities and on building control improvements in the commercial sector.²²

In China, manufacturers and consumers compelled to meet central government goals on emissions and energy efficiency are particularly motivated to forge new ties with innovators abroad. Economically mature Japan is also a serious consumer and producer of energy-efficient technology. It has a strong track record of exporting energy efficient technologies to developing Asian neighbors, including India, Indonesia, Vietnam, Cambodia, Malaysia and others.²³ This type of commercial activity has become a comparative advantage for Japan. It presents a model the U.S. should strive to emulate with developing Asian economies.

South and Southeast Asian states are also attracting foreign technology to expand energy efficiency. For example, international firms have been asked to bid for substantial contracts in retrofitting existing infrastructure in countries such as Vietnam, where energy efficiency performance has been poor.²⁴ The Asia Development Bank has set aside \$40 million for projects at five cement and two steel plants in the country, encouraging bids to upgrade energy efficiency at these industrial sites.²⁵

As many innovators of energy-efficient technology are American, U.S. firms are increasingly developing products and industrial services to expand energy efficiency for industrializing Asian economies. This is becoming an important driver of business between U.S. and Asian firms. It also has the potential to serve as a substantial part of the American economic rebalance to Asia in the future. In a 2010 White Paper, Johnson Controls pointed out several policies that have driven the expansion of trade in energy efficiency technologies in Asia for U.S. companies.²⁶ These include the 2008 Chinese Energy Conservation Law, the Clean Development Mechanism for Asian countries signatory to the Kyoto Protocols, the Indian Climate Action Plan and the Japanese renewable portfolio standard.²⁷ China, long labeled by the United States and others as protectionist when it comes to the clean tech sector, is particularly notable in its signaling that it will open up to private investment to promote efficiency investment.²⁸

Energy Efficiency Enhances Social Stability

Energy efficiency can contribute to quality of life and social stability in the Asia-Pacific region. The reduced emissions associated with greater efficiency can improve environmental quality and calm social instability associated with damaging pollution. Additionally, increased energy efficiency can help to mitigate the environmental effects of climate change. These effects can act as “an accelerant of instability” by introducing stressors on societies and governments ill-equipped to adapt to

such changes.²⁹ Asia, with a major portion of its population located in low-lying coastal areas, is especially prone to sea level rise, changes in food supply, severe weather and other climate change-related environmental impacts, which could affect stability and security.³⁰

In the event of natural disaster or an attack on energy infrastructure, a more energy-efficient economy will be less vulnerable and better equipped to manage energy and power disruptions.³¹ Energy efficiency was a central recommendation issued by the Nomura Research Institute for recovery and resiliency following the 2011 Fukushima disaster in Japan.³² Energy efficiency can serve as a kind of insurance policy against major economic spikes or disruptions.

The United States should leverage and promote expanded energy efficiency investments in developing Asia-Pacific countries as part of its rebalance. Such investments are not merely economically beneficial to U.S. technology developers and the developing Asian economies into which such technologies are sold. They also deliver environmental and social stability benefits for the region. Moreover, they complement the U.S. Defense Department's commitment, as articulated by Secretary Chuck Hagel at a recent Association of Southeast Asian Nations meeting, to energy efficiency in combating climate change and its impacts.³³

Conclusion

Collaboration among stakeholders will be necessary to overcome the complexity of planning, financing, and implementation of investment in energy efficiency. Not only companies, but increasingly regulators, diplomats, and political leadership will need to collaborate. Urgency arises from the need to sustain economic growth and limit harmful emissions in Asia. A top priority for U.S. policy makers, including trade negotiators and security strategists, should be increasing penetration of U.S. energy efficiency technologies in developing Asia-Pacific economies. Trade, regulatory, and legal measures can all be used to this end.

Global lending institutions have already begun to identify networks of energy efficiency technology innovators and investors for Asia, and to prioritize them. Increased energy efficiency will improve economic resiliency, environmental quality and human security in these countries. U.S. policymakers should facilitate expanded investment of this type. Such efforts will significantly enhance U.S. benefits of the Asia-Pacific rebalance and help to assure its success in the years ahead.

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CLIMATE, SECURITY, AND REFORM

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Introduction

Despite growing crises in the Middle East and Russia that have demanded increasing resources and attention in recent months, a central tenet of U.S. foreign policy under President Obama and the current administration remains the rebalance to the Asia-Pacific region. The rebalance to Asia is a multidimensional policy initiative that boasts economic, diplomatic, and military objectives. The military components include “a significant shift of military capacities from other theaters of operation to the Asia-Pacific region and a restructuring of security arrangements” – all of which reflect a strategic approach to U.S. relations in the Asia-Pacific region.¹

Security assistance and cooperation – particularly since September 11, 2001 – have focused on kinetic military action or warfare. But in recent years, the nature of the security threat has evolved. There is growing recognition among U.S. military and diplomatic leaders that climate change impacts – including environmental degradation, water insecurity, and extreme weather – are threat multipliers and can affect the security and stability of a nation and an entire region. According to the ground-breaking 2007 Center for Naval Analysis (CNA) report, climate change impacts can weaken failing or collapsing states, thereby exacerbating “conditions for internal conflicts, extremism, and movement toward increased authoritarianism and radical ideologies.”² Additionally, analysts and military thinkers have correctly recognized that “the repercussions of climate change will require the same application of strategy the military would employ when grappling with any foe.”³

The Asia-Pacific region is particularly vulnerable to climate-related disasters and environmental insecurity. Sixty percent of the world’s population will reside in the Indo-Asia-Pacific by 2018. And much of Asia’s population lives along the coast (80 percent of the world’s population lives within

200 miles of the coast, in fact) in the region's megacities – including Bangkok, Beijing, Jakarta, and Shanghai, – which makes these large population centers quite vulnerable to sea level rise, flooding and typhoons. This means that not only is the region vulnerable to climate-related disasters, but these disasters could result in huge fiscal costs and loss of human life. As noted by Admiral Samuel J. Locklear III, climate change is the biggest long-term threat to the Asia-Pacific region and will put “many people at risk and disrupt the security environment.”⁴

As the United States rebalances to Asia, American military and diplomatic leaders should reassess the current ways that security assistance programs are organized, implemented, and managed. Policy makers must modify security assistance programs to take into account the changing nature of the threat environment and build relevant capacity among allies in the region. Security assistance reforms should include programs that build host nation capacity to prepare for, respond to, and recover from climate-related threats, including natural disasters, extreme weather events, and resource scarcity, as well as from secondary impacts, such as mass migration, political tension and instability, violent conflict, and public health crises.

Security Assistance: A Brief Overview

U.S. security assistance and cooperation has been governed largely by the statutory authority contained in the Foreign Relations and Intercourse (Title 22 U.S. Code) and Armed Services (Title 10 U.S. Code) statutes. As noted by a 2011 Stimson Center report, “Traditionally the State Department plans, budgets and oversees security assistance programs and is the lead agency in charge of all U.S. foreign policy and global engagement” while the U.S. Department of Defense (DoD) implements these programs.⁵ Under the statutory authority, the U.S. has provided support to strategic partners and allies in the form of grants and loans for the purchase of U.S. defense equipment and training, and has supported the education and training of foreign military officers.⁶

However, since September 11, 2001, DoD has taken a greater role in planning, budgeting, and providing security assistance and cooperation. DoD officials developed a proposal for a “Global Train and Equip” authority to increase U.S. support for foreign military and security forces in order to disrupt terrorist networks, to build host country capacity, and to strengthen internal security. In 2006, Congress granted the Department of Defense Section 1206 of the National Defense Authorization Act as a special contingency authority that enabled DoD “to fill long-standing gaps in an effort to help other nations build and sustain capable military forces [....].”⁷ The Section 1206 program gives DoD the authority to train and equip foreign militaries to undertake counterterrorism or stability operations. In addition, it was anticipated by officials at the State Department and DoD that the Section 1206 program would allow the U.S. to “train and equip foreign military forces to respond to “urgent and emergent threats” and opportunities.⁸

The four objectives of security assistance reform are to (1) support host country capacity building in order to strengthen internal stability; (2) support building expeditionary capability; (3) support

continuing cooperation and interoperability; and (4) provide security assistance to support strategic partnerships.⁹ Historically, security assistance efforts have focused on kinetic military action or warfare, and in particular, securing internal stability and counterterrorism efforts.

In recent years, however, a growing number of influential and prominent U.S. military and national security leaders have acknowledged that climate change impacts – including environmental degradation, growing water insecurity, extreme weather events, and natural disasters – can serve as a threat multiplier leading to greater internal instability. A natural disaster, for example, could displace thousands of individuals and stress resource availability, fueling underlying tensions, conflict, and political instability.¹⁰ These climate change-related shocks are much different from cross-border kinetic shocks, but could still require military action to address. To illustrate, following the 2004 tsunami in Southeast Asia, the U.S. Department of Defense launched “Operation Unified Assistance,” for which the U.S. provided logistics and communications support, satellite imagery, and various supplies.¹¹ In addition, the annual Pacific Partnership exercises, hosted by the U.S. Navy, seek to promote stability, disaster preparedness and response capacity, interoperability, and partnerships among host nations in the Asia-Pacific, nongovernmental organizations, and the U.S. Navy.

Despite the growing recognition that the threat environment is rapidly changing, U.S. military and diplomatic officials have not revisited the issue of security assistance and cooperation to ensure that current security assistance programs are adequately helping governments prepare for and respond to these new challenges.

A Philippine resident sits outside of his home in the aftermath of Super Typhoon Haiyan. November 2013. DEFENSE IMAGERY / LIAM KENNEDY, MCSN.



Security Assistance Reform and the Rebalance to Asia

Given the nature of the new threat environment and the potentially destabilizing impact of climate change on host country governments and their internal stability, decision makers within the U.S. Department of State and the Department of Defense should design security assistance programs so that they help build the capacity of our allies in the Asia-Pacific region to prevent, respond to, and recover from climate-related events. Security assistance programs should support disaster risk reduction, response, and resilience efforts.

In the recent 2014 *Quadrennial Defense Review*, the Department of Defense acknowledges that the rebalance to Asia will affect force structure, weapons systems and platforms, and operations.¹² DoD also writes that “it will employ creative ways to address the impact of climate change, which will continue to affect the operating environment and the roles and missions that U.S. Armed Forces undertake. The Department will remain ready to operate in a changing environment amid the challenges of climate change and environmental damage. Climate change also creates both a need and an opportunity for nations to work together, which the Department will seize through a range of initiatives. We are developing new policies, strategies, and plans, including [...] our work in building humanitarian assistance and disaster response capabilities, both within the Department and with our allies and partners.”^{13 14}

Historically, the Department of State has worked closely with DoD and the Pacific Area Command (PACOM) “to support military engagement throughout the region in a way that enhances our partnerships, builds local capacity to deal with threats and disasters, and promotes democratic values and development. [...] Foreign Military Financing (FMF) and International Military Education and Training (IMET) programs play a key role by building partner capacity, including strengthening maritime domain awareness capabilities, working with partners as they develop and professionalize their armed forces, and enhancing our partner capabilities and interoperability to work with the United States to address emerging challenges, both internationally, and in the region.”¹⁵

However, despite ongoing efforts and programs, the State Department and DoD have yet to conduct a formal review and assessment of security assistance programs in light of these new security threats. But the widespread recognition by U.S. military and diplomatic leaders of the security implications of climate change in the Asia-Pacific region suggests that there exists an opportunity to pursue security assistance reform.

Recommendations for Security Assistance Reform

There are number of strategies that U.S. decision makers should consider to reform and strengthen

security assistance and cooperation so that the United States and our allies in the Asia-Pacific region can more effectively respond to the new security environment. Policy recommendations, which focus largely on reorganizing the responsibilities of agencies within the U.S. government and on building host country capacity, are discussed below. These recommended strategies can be included within existing security assistance programs designed to build host country capacity, support continuing cooperation and interoperability, and provide security assistance to support strategic partnerships.¹⁶

Improve coordination and integration among U.S. authorities

1. Clarify responsibilities

Officials should review, assess, and modify the division of funding and implementation responsibilities between the U.S. Department of Defense and the State Department. The Department of State owns more traditional security assistance programs – including FMF and IMET; DoD later added their own programs, including the Counter Terrorism Fellowship Program. This has resulted in “overlapping or ambiguous lines of authority and responsibility between the two departments.”¹⁷ The 2011 Stimson Report concluded that the division of responsibilities between DoD and the State Department was often unclear.” In the context of a changing external security environment and challenges, there is urgency to “clarify the institutional relationship between the two principal departments involved in security assistance programs.”¹⁸ In particular, U.S. military and diplomatic leaders need to review the current security assistance reform programs with an eye toward recognizing the broader security threat and acknowledging the need to build host nation capability in disaster risk reduction, response and recovery. Decision makers need to identify the clear lines of responsibility for planning, managing, and funding programs related to improving the preparedness, resiliency and response capacity of our partner nations in the Asia-Pacific.

2. Integrate capabilities and planning

Climate change is characterized by increasing volatility in extreme weather patterns and natural disasters, which are generally unpredictable. Unlike planning for wars, responses to natural disasters require immediate short-term ramp-up capacity. Using the Foreign Relations and Intercourse (Title 22 U.S. Code) statute as the legal and operational framework, policymakers should explore ways to expand the role of other U.S. government agencies to support disaster preparedness planning and response.

In addition to DoD and the State Department, several other U.S. government agencies are also working on disaster risk reduction, response, and resilience in the Asia-Pacific Region, including

the U.S. Department of Homeland Security (DHS), as well as the Federal Emergency Management Agency (FEMA) and the U.S. Coast Guard (USCG), both of which reside organizationally within DHS. DHS has the third largest presence overseas, following the U.S. Department of Defense and the Department of State).

The U.S. Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA) are currently engaged in the Asia-Pacific on the topic of disaster risk reduction and resilience. In Asia, DHS has identified a number of critical partners: China, India, Japan, South Korea, and Australia (and concrete partnerships have been forged with the last three countries). The USCG is often tasked by PACOM to support security cooperation efforts and plays a critical role in bilateral security assistance reform efforts. Often, the U.S. Department of Defense (Navy) allocates resources to DHS/USCG (as well as the State Department and to the Combatant Commands) to assume various aspects of security cooperation (e.g., joint military exercises such as RIMPAC, and trainings).

Despite ongoing collaboration, DHS is not fully integrated into foreign assistance security assistance missions and operations. Fully integrated planning and programming are often hampered by institutional and legal barriers, and information and coordination silos. Decision makers within the Department and Defense and DHS should work together to explore ways to more fully and effectively integrate DHS into foreign security assistance missions and operations in the Asia-Pacific region.

DoD should also consider funding DHS to support the National Guard State Partnership Program (SPP), security partnerships between a state's National Guard and the armed forces in a partner country. Through SPP, the National Guard conducts military-to-military engagements in support of defense security goals but also leverages whole-of-society relationships and capabilities to facilitate broader interagency and corollary engagements spanning military, government, economic and social spheres. Often these cooperative security partnerships focus on disaster preparedness and response and resiliency efforts. DoD could include DHS as part of the SPP interagency agreement.

In addition, greater coordination between the DoD Joint Chiefs of Staff and civilian authorities at the State Department is needed to expand military-civil solutions to climate-related security issues and to task and empower civilian capacity to implement broader security sector assistance.

Under State Department leadership, U.S. civilian agencies should explore opportunities to extend security assistance to foreign police, constabulary forces, courts, and the justice system.

3. Improve information sharing across agencies

Military and diplomatic officials should establish an interagency task force to share information

about security assistance efforts around disaster risk reduction and resilience, including preparedness and response, and improve coordination of planning and training efforts. Policymakers should also strengthen coordination and information sharing within existing initiatives and efforts, such as the Asia-Pacific Disaster Risk Reduction and Resilience Network (APDR3) (involving Indonesia, Japan, the Philippines, and Vietnam), which connects public and private organizations to strategically solve regional problems in disaster management, as well as energy, water, health, and climate change.



An Armed Forces of the Philippines soldier directs displaced personnel during Operation Damayan, where the Government of the Philippines closely coordinated with international relief efforts to help those in need. November 2013. **DEFENSE IMAGERY / LANCE CPL. CALEB HOOVER**

Building host country capacity

1. Support purchase of dual use equipment

Currently, the Foreign Military Sales (FMS) Program, a core component of the security assistance program which is authorized by the Arms Export Control Act (AECA), provides for the sale of

defense articles and/or defense services (to include training) from the Department of Defense stocks or through purchase under DoD-managed contracts. U.S. officials should work to ensure that countries can use FMS funds to purchase dual use equipment that can be used for both traditional military activities and disaster operations. For example, Typhoon Haiyan that devastated the Philippines in 2013 revealed the lack of air and naval transport capabilities, as well as ground assets (i.e. trucks, utility vehicles, amphibious vehicles) that can be used for both military operations and disaster response efforts.¹⁹ Arguably, these gaps in the Philippine's military capacity may have prompted the long-term military agreement penned between the Philippines and the United States in late April 2014 during President Obama's trip to East Asia.

2. Develop a specifically tailored disaster response training and equipment program

Officials at DoD and the Department of State, in collaboration with DHS and FEMA, should design and implement a disaster response training and equipment program that could be integrated into the current course offerings and trainings provided by DoD and the USCG to host nation military and security stakeholders.

Additionally, officials should explore ways to standardize risk reduction, preparedness, and response operations across agencies and partner nations in the Asia-Pacific region in order to improve interoperability. According to subject matter experts, new legislation and policy reforms are needed in the areas of liability, licensing and equipment certification so as to enable agencies, including DHS and other stakeholders, to standardize operations related to disaster preparedness and response.

In April 2014, U.S. Representative Randy Forbes (R-Virginia) and Colleen Hanabusa (D-Hawaii) proposed the Asia Pacific Region Priority Act, which called for the availability of training areas within the U.S. Pacific Command Area of Responsibility. The proposed legislation stated that sustaining training facilities in the PACOM Area of Responsibility (AOR) "is essential to not only the continued preparedness of the U.S. military, but also to developing the partner capacity and interoperability necessary for effective security cooperation in the Asia-Pacific."²⁰ While the legislative effort was not successful, it does reflect growing awareness by decision makers about the importance of have designated facilities and training to build the capacity and preparedness of our partners in the Asia- Pacific region.

3. Expand training and capacity building in areas of science and technology (S&T)

Many countries are interested in the analytic and predictive models used by the U.S. government and are interested in developing science and technology (S&T) partnerships with U.S. agencies that

provide security assistance. Many of the strategic allies of the United States in Asia need assistance with scenario planning and coordination and have significant geo-engineering needs, data needs, geospatial mapping, and land use and ocean and marine spatial planning. For example, the U.S. Navy, a widely recognized scientific body, has provided S&T cooperation. The U.S. Army's Corps of Engineers is currently developing a quantitative, analytical tool that measures risk reduction efforts by assessing infrastructure planning, planning efforts, warning systems and evacuation plans. U.S. military and diplomatic leaders should explore ways to improve coordination across the U.S. government to develop these S&T partnerships that can help governments in the Asia-Pacific region address new security threats and build capacity in the area of reducing, responding to and recovering from climate-related events, including natural disasters.

While efforts to fully pivot to the Asia-Pacific region have been slowed by growing violence in the Middle East and North Africa and diplomatic crises with Russia, military and diplomatic strategists well understand the long-term economic and military importance of fully engaging with our partners in the Asia-Pacific Region. Critical to our mutual success is our ability to build capacity among our allies in the region to prepare for and respond to the changing external threat environment, which consists of both kinetic and non-kinetic threats. The recommendations outlined here can be included within existing security assistance programs designed to build host country capacity, support continuing cooperation and interoperability, and provide security assistance to support strategic partnerships.

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The Center for Climate and Security (CCS), a non-profit policy institute with a distinguished Advisory Board of senior retired military leaders and security professionals, envisions a climate-resilient international security landscape. This is a world which recognizes that climate change risks to security are unprecedented in human history, and does not wait for absolute certainty before acting to mitigate and adapt to those risks. To further this goal, CCS facilitates policy development processes and dialogues, provides analysis, conducts research, and acts as a resource hub in the climate and security field.

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