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**Converging Peril : Climate Change and
Conflict in the Southern Philippines**

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ABSTRACT

The provinces of the Autonomous Region of Muslim Mindanao (ARMM) in the southern Philippines are experiencing convergence risks from climate change and violent conflict. These provinces combine a natural vulnerability to the effects of climate change with a low adaptive capacity to meet the challenges posed by detrimental climate shifts. Provinces in the ARMM depend heavily upon coastal resources, which are highly susceptible to climate-driven ecological changes, for the livelihoods and life support systems of their populations. These same provinces possess some of the lowest development indicators in the Philippine archipelago, which makes adaptation to the effects of climate change substantially more difficult. Physical and societal vulnerability to climate change in ARMM provinces combines with an established conflict dynamic between elements of the Moro population and the Government of the Republic of the Philippines (GRP). Because of the connectedness of these issues, the potential for climate change to lead to greater deprivation and social challenges in the ARMM is an important consideration for peacebuilding efforts in the region. Recognising the potential relationships between climate change and conflict in Mindanao is an important step towards employing integrated approaches that address both climate and security challenges. While increasingly clear scientific evidence demonstrates that climate change poses significant challenges for many sectors of society, determining the appropriate place for climate change in security studies remains a difficult task. Climate change requires a re-evaluation of traditional security norms that respects its potential to exacerbate conflict dynamics and make peacebuilding efforts more difficult. A comprehensive approach to security that includes conflict drivers from a multitude of sectors represents the most appropriate framework for addressing climate and conflict challenges. This working paper argues that recognising the interplay between climate change and insecurity is a central step towards adopting comprehensive strategies for promoting stability in Mindanao and other vulnerable regions. Integrated strategies that address adaptation to climate change as well as traditional conflict drivers provide a progressive way to address intersecting climate and conflict vulnerability.

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He conducted his NTS-Asia Fellowship through the Institute for Strategic and Development Studies (ISDS) in Diliman, The Philippines. The ISDS is a non-profit policy research and advocacy institution that was founded by a group of academics from the University of the Philippines Diliman in 1991. Its work addresses the need for an ongoing evaluation of the changes in national and international affairs and provides a venue for research that addresses contemporary national, regional and international affairs. Mr Ewing's study contributes to the ISDS endeavour by applying research on climate change and security to the contemporary challenges faced in Mindanao. The resulting working paper provides useful analyses on the correlations between climate change and instability, and promotes strategies that address climate and stability challenges concomitantly.

Converging Peril: Climate Change and Conflict in the Southern Philippines

Introduction: Climate Change and Security

Increasingly voluminous, coherent and consistent scientific research on climate change over the last decade has made the discourse on humankind's relationship with our natural environment both more complex and more prescient.¹ The Intergovernmental Panel on Climate Change's (IPCC) 2007 release of the 4th Assessment Report (AR4) shows, with the greatest confidence ever put forth by the IPCC, that anthropogenic alterations to the atmosphere will have specific, lasting and potentially acute ramifications for societies around the world.² United Nations (UN) Secretary-General Ban Ki Moon referred to the findings of the AR4 during his 2007 address to the United Nations Security Council (UNSC) stating, "According to the most recent assessments of the Intergovernmental Panel on Climate Change, the planet's warming is unequivocal, its impact is clearly noticeable, and it is beyond doubt that human activities have been contributing considerably to it."³

The IPCC provides evidence that the planet's warming will have wide-ranging short-term effects on a myriad of natural systems that are essential for sustaining the viability and progress of many communities. An appropriate example of such effects relates to hydrological cycles, where the IPCC asserts with high confidence that during the coming half century, drought-affected areas will become more expansive while other locations will

¹ There are varying definitions of climate change. For example, the IPCC uses the term to refer to "any change to the climate over time, whether due to natural variability or as a result of human activity". The United Nations Framework Convention on Climate Change (UNFCCC) limits its use of the term to "a change in climate is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to the natural climate variability observed over comparable time periods." See "IPCC, 2007: Summary for Policymakers" in M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. Van der Linden & C. E. Hanson (Eds.), *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, UK: Cambridge University Press, 7-22, 2007. This paper does not discuss climate change mitigation, focusing rather on the effects of climate change and society's capacity to adapt to climatic alterations, and the causes of climate change are not discussed beyond the introductory paragraph. Therefore, the IPCC definition is appropriate for this paper.

² IPCC (2007a), *Fourth Assessment Report, Climate Change 2007: A Synthesis Report*, Valencia, Spain: Adopted at the IPCC Plenary XXVII. The IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme. Its stated mandate is to provide the global community with contemporary and comprehensive scientific, technical and socio-economic information on climate change. The findings and recommendations of the IPCC have formed foundations for many policies implemented locally, nationally and internationally through the UNFCCC.

³ Ban Ki Moon, Statement at the Security Council Debate on Energy, Security and Climate, 17 April 2007. Available at http://www.un.org/apps/news/infocus/sgspeeches/search_full.asp?statID=79#.

experience greater heavy precipitation events and flood risks.⁴ The AR4 also predicts with high confidence that river runoff will decrease between 10 to 30 per cent across many dry regions and mid-latitudes, and glacially-stored water supplies will decline, reducing water availability for over one-sixth of the global population.⁵ The changes in rainfall patterns at the source of these problems will affect both freshwater availability and agricultural production.⁶ Increased draught conditions lead to water scarcity which reduces water available for consumption and negatively affects crop yields. Among populations dependent upon local agriculture for food and income, smaller crop yields can lower individual caloric intake, which negatively affects human health, while reducing household incomes necessary for human development.⁷ Major precipitation events resulting from climate change also have the substantial capacity to affect individuals and social systems. Greater runoff from increased precipitation has negative consequences for agricultural production. Flooding, while also compromising agriculture, can lead to population displacements that erode the social and economic foundations of affected communities and create strains upon communities receiving displaced peoples.⁸

The effects of climate change on natural systems create formidable challenges for vulnerable individuals and social systems. Authors for the Global Humanitarian Forum write that climate change reduces economic growth, perpetuates poverty, and brings hunger and disease to significant segments of the global population.⁹ The social ramifications of climate change are not aggregated but rather affect individuals and societies in different ways, and in varying degrees, depending upon natural and social vulnerability. The IPCC defines “vulnerability” as “the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.”¹⁰ Susceptibility can be either

⁴ IPCC, 2007, op. cit., 11.

⁵ Ibid.

⁶ Ibid., 12.

⁷ United Nations Development Programme (UNDP), *Human Development Report 2007/2008: Fighting climate change: Human solidarity in a divided world*, New York: Palgrave Macmillan.

⁸ For research on environmentally-driven migration see Swain, A. “Environmental migration and conflict dynamics: focus on developing regions.” *Third World Quarterly* 17(5), 959-73, 1996; Hugo, G. “Environmental Concerns and International Migration.” *International Migration Review* 30(1), 105-31, 1996; M. Couldrey & M. Herson (Eds.), *Forced Migration Review: Climate Change and Displacement*, 4-80, 31 October 2007.

⁹ Global Humanitarian Forum. *Human Impact Report – The Anatomy of a Silent Crisis*. Geneva: Global Humanitarian Forum, 1, 2009. This report estimates that climate change is currently responsible for 300 000 deaths, affects 325 million people seriously and results in economic losses of US\$ 125 billion annually. The authors of the report admit that these figures carry a significant margin of error.

¹⁰ Parry, M. L., Canziani, O. F., Palutikof, J. P. et al., “Technical Summary” in M. L. Parry, O. F. Canziani, J. P. Palutikof & P. J. Van der Linden (Eds.), *Climate Change 2007: Impacts, Adaptation and Vulnerability*.

physical, in which the ecological character of an area is vulnerable to the physical effects of climate change, or social, in which the capacity for individuals and societies to meet the physical challenges of climate change is low. The dissemination of climate impacts varies geographically; both in terms of the natural challenges faced and the capacity of the various populations to deal with such challenges. The IPCC defines “the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with consequences” as the system’s “adaptive capacity.”¹¹ It is in the developing world, where vulnerability is often high, adaptive capacity regularly low, and livelihoods frequently closely tied to natural resources where climate change has the most acute impact.¹²

The increasingly observable social consequences of climate change have led to its consideration as a potential security threat. According to Thomas F. Homer-Dixon, a widely-cited scholar on environmental conflict,

Climate stress may well represent a challenge to international security just as dangerous - and more intractable – than the arms race between the United States and the Soviet Union during the Cold War or the proliferation of nuclear weapons among rogue states today...It’s time to put climate change on the world’s security agenda.¹³

Parties traditionally concerned with conventional and militaristic approaches to security threats have also added climate change to security calculations. The military advisory board to the Center for Naval Analyses (CNA) Corporation’s Report, *National Security and the Threat of Climate Change*, writes, “Climate change can act as a threat multiplier for instability in some of the most volatile regions of the world, and it presents significant national security challenges...”¹⁴ Another sign of the climate’s emergence in security studies

Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 23-7). UK: Cambridge University Press, 2007.

¹¹ IPCC, 2007, op. cit., 21.

¹² See for instance Smith, D., & Vivekananda, J. “A Climate of Conflict: The links between climate change, peace and war”. *International Alert*, November 2007.

¹³ Dixon, T. F. H., cited in K. M. Campbell, J. Gullledge, J. R. McNeill, J. Podesta, P. Ogden, L. Fuerth, R. J. Woolsey, A. T. J. Lennon, J. Smith, R. Weitz & D. Mix, “The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change”. *Center for New American Security and Center for Strategic & International Studies*, November 2007.

¹⁴ The CNA Corporation. *National Security and the Threat of Climate Change*. Alexandria, VA: CNA Corp., 3, 2007. The assertion that this position originates from sources conventionally focused upon traditional security threats stems from the make-up of the military advisory board. It is chaired by General Gordon R. Sullivan, USA (Ret.) and made up of ten additional retired military personnel.

came when the Center for New American Security (CNAS) and the Center for Strategic and International Studies (CSIS) published a substantive report in late 2007 which created detailed scenarios, from an international security perspective, for three respective increases in global mean temperatures.¹⁵ These scenarios predict large-scale migration patterns, increased ethnic, social and religious cleavages, and greater absolute and relative deprivation throughout the developing world. The social fracturing, migration and deprivation dynamics presented in the CNAS/CSIS Report represent, according to the authors, significant risks to the security of individuals, states and the international system.

An apparent sign that the international governing community was responding to declarations about climate-driven security threats came in April 2007 when the UNSC held a ministerial meeting to discuss the relationships among energy, security and climate. However, the results, or lack thereof, of this meeting deviate from the warnings of climate insecurity and more accurately portray the place climate change currently occupies in the field of international security. The inability of the UNSC dialogue to determine the relevancy of climate change in security studies may be seen as a microcosm of the larger debate over the expansion of security studies to include the natural environment. Opposing parties to the debate disagreed fundamentally over whether climate change was a security issue *or* if it is a topic that is more appropriately addressed as part of the sustainable development agenda. The United Kingdom, arguing in the affirmative for a place for climate change in security discourse, claimed through a concept paper that traditional aggravators of conflict, namely border disputes, migration, energy supplies, resource scarcities, societal stress and humanitarian crises, could all be exacerbated in various ways by the changing climate.¹⁶ More vividly, Papua New Guinea's representative, speaking on behalf of the Pacific Islands forum, claimed that the dangers posed by climate change to small islands were tantamount to the threat posed by guns and bombs in other localities.¹⁷ Adversely meanwhile, China and Pakistan claimed to speak on behalf of developing nations, including the Group of 77 (G77), when they argued that climate change was an issue of sustainable development and lacked relevancy in the UNSC forum.¹⁸ According to the Pakistani representative, the UNSC has the

¹⁵ Campbell et. al., 2007, op. cit.

¹⁶ United Kingdom Mission. "Energy, Security and Climate, Security Council open debate: UK concept paper". 28 March 2007.

¹⁷ Security Council, SC/9000. "Security Council Holds First Ever Debate on Impact of Climate Change on Peace, Security, Hearing over 50 Speakers". Press release. 17 April 2007. Available at <http://www.un.org/News/Press/docs/2007/sc9000.doc.htm>.

¹⁸ Sindico, F. "Climate Change, A Security (Council) Issue?" *Carbon and Climate Law Review* 1, 29-34, 2007.

primary task of maintaining international peace and security and that other issues, such as those pertaining to sustainable development, should remain within more appropriate bodies such as the UN General Assembly and the Economic and Social Council.¹⁹ The session disintegrated from a discussion on the relevancy of climate change for security studies into a row over which UN bodies are most appropriate for dealing with various issues.

The brief UNSC dialogue provides a contemporary and practical illustration of the difficulties inherent with expanding security discourse to include environmental variables such as climate change. Like the UNSC dialogue, the debate concerning the appropriate place (if any) for the environment in security studies has found consensus exceedingly difficult to attain. This paper enters this debate by exploring the convergence between climate vulnerability and the seemingly implacable conflict between the Government of the Republic of the Philippines (GRP) and elements of the Moro population based in the restive regions of Mindanao.²⁰ First, the paper reviews the debate over expanding security to include issues outside of the traditional military sphere. Establishing the relevance of a more inclusive security discourse is essential for analysing potential consequences climate shifts have for security threats. Second, the paper critically considers existing literature on such security risks said to be related to climate change. This section establishes the character of states and communities that are seen as vulnerable to climatic contributions to insecurity, and explore the ways in which regions in the southern Philippines fit such criteria. Since climate challenges include interactions among physical and social variables, the paper analyses the climate-conflict connection within the relevant social contexts. Thirdly, upon extrapolating linkages between climate and security risks in the Philippines, the study concludes by addressing the potential for a positive interplay between conflict resolution and climate change adaptation strategies. This final section explores the possibility that such measures are complementary and that an effective conflict resolution strategy in the southern Philippines will benefit from environmental stewardship and effectual climate adaptation measures.

¹⁹ Ibid.

²⁰ 'Moro' is a name which the greater Muslim community in the southern Philippines adopted from their former Spanish colonisers. The leadership, organisation and locations of these so-called 'Moro elements' are complex and fluid. At present, three groups key to this discussion are the Moro National Liberation Front (MNLF), the Moro Islamic Liberation Front (MILF) and the Abu Sayyaf Group (ASG). To avoid straying from the topic of climate change's implications for conflict in the Philippines, the relationships, evolutions and character of these groups are not discussed in this study. For information on such topics, see International Crisis Group (ICG), "The Philippines: The Collapse of Peace in Mindanao". Policy Briefing No. 83, 2008; ICG, "Southern Philippines Backgrounder: Terrorism and the Peace Process". Asia Report No. 80, 2004; Crowley, Z. "Abu Sayyaf". Policy Brief: Center for Policing Terrorism, 2005.

1. Expanding the Security Discourse

A. Expansionist

Exploring connections between security threats and climate change requires first answering fundamental questions as to who or what is being secured and what constitutes a threat that requires such securing. For the majority of the twentieth century, answers to these questions in both policy and academic circles focused on the security of states from external military threats. During the heightened tension of the Cold War, much Western scholarship and policymaking came to equate security studies with military strategy.²¹ However, the convergence of the end of the Cold War with an increased awareness of global environmental and development challenges led to calls for expanding this traditional security paradigm. Proposed expansions challenged the Cold War focus on military confrontation and the primacy of the state as the appropriate referent object of security.

The re-evaluation of what sectors are relevant to security studies defined the subfield during the early 1990s. In 1991, for example, the sitting North Atlantic Treaty Organization (NATO) Secretary-General, Manfred Wörner, stated that “the immense conflict building up in the Third World, characterised by growing wealth differentials, an exploding demography, climate shifts and the prospect for environmental disaster, combined with the resources conflicts of the future, cannot be left out of our security calculations.”²² Former US Colonel and military attaché, Dan Henk, cites the 1992 announcement by the London-based International Institute for Strategic Studies (IISS) as exemplifying the shifting security dynamics of the time. The IISS, an institute with a storied history of traditional security

²¹ Baldwin, D. A. “Review: Security Studies and the End of the Cold War”. *World Politics*, 48(1), 117-41, 1995. Baldwin offers a review of a wide-ranging body of scholarship on post-Cold War security studies reform, reviewing over fifty authors in four works: Allison, G. and Trevorton, G. F. (Eds.), *Rethinking America's Security: Beyond Cold War to New World Order*, New York: W. W. Norton, 1992; Gaddis, J. L. *The United States and the End of the Cold War: Implications Reconsiderations, Provocations*, New York: Oxford University Press, 1992; M. J. Hogan (Ed.), *The End of the Cold War: Its Meaning and Implications*, New York: Cambridge University Press, 1992; R. Shultz, R. Godson & T. Greenwood (Eds.), *Security Studies for the 1990s*, New York: Brassy's. Baldwin's analysis is admittedly limited by being US-centric, but, given the principal role of the US in international relations both during and after the Cold War, and the wealth of scholarship on security studies emanating from the US, these analyses are valuable. Baldwin asserts that the US conceptions of security became highly militarised during the periods of heightened tension during the Cold War and more expansive during calmer periods. Thus the period from 1955 to 1965, with its focus on nuclear deterrence, moved away from a more comprehensive assessment of security a decade earlier. Likewise, heightened tension in the late 1970s and early 1980s took attention away from rising policy sectors dealing with environmental challenges, poverty in the developing world and rising economic interdependence.

²² Quoted in Kahl, C. H. *States, Scarcity and Civil Strife in the Developing World*, Princeton: Princeton University Press, 2006, 2.

analyses, expanded its focus from the “influence of modern and nuclear weapons of warfare upon the problems of strategy, defence, disarmament, and international relations” to a more encompassing area of interest including “any major security issues, including without limitation those of political, strategic, economic, social or ecological nature.”²³ Expanding the scope of security to include the spheres outside of the military focus was essential for future efforts to link climate and security. In addition to this expansion, however, the referent object of security studies was also called into question during the post-Cold War years.

The United Nations challenged the position of the state as the primary referent object of security by positing the concept of “human security” in its 1993 *Human Development Report*.²⁴ A reflexive term, human security shifts the focus away from states to individuals.

The 1994 *UN Human Development Report* elaborated upon this concept, stating,

The concept of security has for too long been interpreted narrowly: as security of territory from external aggression, or as protection of national interests in foreign policy or as global security from the threat of nuclear holocaust...Forgotten were the legitimate concerns of ordinary people who sought security in their daily lives...For many of them, security symbolised protection from the threat of disease, hunger, unemployment, crime, social conflict, political repression, and environmental hazards.²⁵

The 1994 Report argues that wide-ranging security risks faced by individuals on a daily basis were under-acknowledged in the pervading security discourse of the time. It suggests an expansion of security organised along seven sectors:

1. *Economic security*, access to an income above poverty levels.
2. *Food security*, access to adequate food.
3. *Health security*, access to health care and disease prevention.
4. *Environmental security*, freedom from environmental hazards such as pollution and resource depletion.
5. *Personal security*, physical safety from violence such as war, torture and violent crime.

²³ Vale, P. “Can International Relations Survive?” *International Affairs Bulletin*, 16(3), 100, 1992. Cited in Henk, D. “Human Security: Relevance and Implications”. *Parameters*, 92, Summer 2005.

²⁴ United Nations Development Programme, *Human Development Report 1993*. Available at <<http://hdr.undp.org/reports/global/1993/en>>.

²⁵ United Nations Development Programme. *Human Development Report 1994*, 22. Available at <<http://hdr.undp.org/reports/global/1994/en>>.

6. *Community security*, protection of traditional cultures and indigenous groups.
7. *Political security*, freedom from oppression and presence of political and civil rights.²⁶

Since the 1994 Report, human security has received much scholarly and political attention; resulting in several definitional variances.²⁷ The point of convergence amongst these variances however, is the placement of individuals as referent objects in security studies. Such expansions, however, have not gone unchallenged.

B. Traditionalist Rebuttals

Traditionalist arguments challenge the analytical value of security expansion and demonstrate problems with expansionist security proposals that require attention. The primary objection to expanding the security focus is that the addition of multiple variables erodes the theoretical possibilities and analytical value of security research.²⁸ Stephen Walt, a principal neorealist scholar, stated in 1991 that from the mid-1970s security studies became more “rigorous, methodologically sophisticated, and theoretically inclined,” and that this led to an increased prominence for the security subfield.²⁹ Walt determines the scope of security to be “the study of the threat, use, and control of military force” and tasks security inquiries with exploring “the conditions that make the use of force more likely, the ways the use of force affects individuals, states, and societies, and the specific policies states adopt in order to prepare for, prevent, or engage in war.”³⁰ For Walt, expanding the field beyond these parameters would “destroy its intellectual coherence” and make the emerging problems added to security studies more difficult to address.³¹ Roland Paris lodges a similar grievance towards human security specifically. Paris evaluates multiple approaches to human security research and concludes

²⁶ Ibid., 24-33.

²⁷ See Newman, E. “Human Security and Constructivism”. *International Studies Perspectives* 2, 242-47, 2001; King, G., & Murray, C. J. L. “Rethinking Human Security”. *Political Science Quarterly*, 116(4), 585-610, 2001/2002; Henk, D. “Human Security: Relevance and Implications”. *Parameters*, 92-8, Fall 2005.

²⁸ See Gray, C. “New Directions for Strategic Studies? How Can Theory Help Practice”. *Security Studies* 1, 610-36, 1995; Mearshiemer, J. “The False Promise of International Institutions”. *International Security* 19, 5-49, 1994/1995.

²⁹ Walt, S. M. “A Renaissance of Security Studies”. *International Studies Quarterly* 35, 211-12, 1991. Walt defines security as a ‘subfield’ rather than a ‘field.’ This thesis, however, delineates security as a ‘field’ under which environmental security exists as a ‘subfield.’

³⁰ Quoted in Stern, E. K., “The Case for Comprehensive Security” in D. Duedney & Richard A. Matthews (Eds.), *Contested Grounds: Security and Conflict in the New Environmental Politics* (p. 135). Albany, NY: SUNY Press, 1999.

³¹ Ibid. For a detailed review of these and other neorealist claims see Krause and Williams, 1992.

that human security has little utility for either policymakers or scholars.³² Paris declares that the excessive inclusiveness of human security lacks the analytical separation necessary to discuss causality, and concludes that “if human security means almost anything, then it effectively means nothing.”³³ The security expansion conundrum is that traditional models rigorously focus on military matters and thus run the risk of overlooking security threats emanating from non-traditional, non-military sources. Conversely, expanded security conceptions address this problem by becoming more inclusive, but in doing so risk becoming substantively and analytically useless. This challenge must be addressed to include climate change in security studies in an analytically coherent way.

C. Comprehensive Security

Comprehensive security theory provides a framework for widening security that reconciles some traditionalist criticisms concerning the risk of damaging the field’s intellectual coherence. Comprehensive security places conflict at the centre of security discourse while showing a willingness to include non-military variables relating to conflict. Joe Camilleri provides a useful working definition of comprehensive security as such:

[a] particular practice or relationship may be deemed relevant to comprehensive security when it is likely to create new conflicts or exacerbate existing ones either between or within nations, especially to the extent that these are likely to involve the use or threat of force. As a corollary to this, a particular practice or relationship may be said to contribute to comprehensive security when it helps to resolve or obviate conflicts between and within nations, and especially armed conflicts.³⁴

Comprehensive security therefore retains the focus on conflict insisted upon by the traditionalists while creating a place for social variables as promoted by security expansionists.

Comprehensive security theory finds the balance between the two poles to the security

³² Paris, R., “Human Security: Paradigm Shift or Hot Air?” in M. E. Brown, O. R. Cote Jr., S. M. Lynn-Jones & S. E. Miller (Eds.), *New Global Dangers: Changing Dimensions of International Security* (pp. 249-64). Boston: MIT Press, 2004.

³³ Ibid., 255.

³⁴ Camilleri, J., “The Pacific House: The Emerging Architecture for Comprehensive Security” in D. Dickens (Ed.), *No Better Alternative: Towards Comprehensive Security in the Asia-Pacific* (p. 83). Wellington, NZ: CSCAP, 1996.

expansion debate by organising threat areas among sectors. These are divided five-fold:

1. *Military security* “concerns the two-level interplay of the armed offensive and defensive capabilities of states, and states’ perceptions of each other’s intentions”.
2. *Political security* “concerns the organizational stability of states, systems of government and the ideologies that give them legitimacy”.
3. *Economic security* “concerns access to the resources, finance and markets necessary to sustain acceptable levels of welfare and state power”.
4. *Societal security* “concerns the sustainability, within acceptable conditions for evolution, of traditional patterns of language, culture and religious and national identity and custom”.
5. *Environmental security* “concerns the maintenance of the local and the planetary biosphere as the essential support system on which all other human enterprises depend.”³⁵

The sectoral approach is a way to “disaggregate” complex wholes within security inquiry for the ontological purpose of observing patterns both within and among the sectors.³⁶ These sectors usefully stratify phenomena that can interact and combine to cause insecurity. Organising security questions into sectors is an effective way to “reduce complexity” and create coherent structures during initial phases of security inquiry.³⁷ It is vital to note, however, that these sectors are not independent but rather interactive parts of a larger whole. Mechanisms driving phenomena in the different sectors can and do effect each other. Understanding relationships occurring amongst the different sectors of analysis is vital to understanding the overall security issue under examination. From a methodological standpoint, this means that after initial disaggregation, the task for the comprehensive security researcher becomes to “reassemble” the sectors with an understanding of relationships among them.³⁸

The comprehensive security framework is ideal for addressing the climate and conflict connection. Climate change is not a conflict driver that exists independently, but rather one with the potential to interact with social systems to foment unrest and violence. These

³⁵ Italics added. List adapted from Buzan, B. *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, 2nd ed (pp. 21-2). Boulder: Lynne Rienner, 1991.

³⁶ Buzan, Waever & de Wilde, 1998, op. cit., 8.

³⁷ Ibid.

³⁸ Ibid., This thesis addresses the process of disaggregation and reassembly in much greater detail in the following chapter.

interactions between natural and social phenomena are complex and create a causal chain which is not easily revealed. Marc Levy describes this challenge thus:

[U]nderstand that environmental factors interact with a variety of other factors to spawn violent conflict. By the time one arrives at the end of the logical chain – violent conflict – so many intervening variables have been added that it is difficult to see the independent contribution of environmental degradation.³⁹

A comprehensive approach to security leads to research that explores relationships among data from different sectors. These relationships are vital to the overall picture of the insecurity under study. In the case of climate-driven insecurity, the literature reveals a vulnerability model defined by areas facing natural challenges caused by climate change and possessing a low adaptive capacity to deal with these challenges.

D. Climate and Conflict

A striking level of uniformity exists in recent literature as to the character of states and communities that face the greatest risk of climate-driven insecurity.⁴⁰ Three key themes of such observations are: 1) that developing regions often have economic systems in which significant portions of the population rely directly on natural resources for livelihood and sustenance, 2) that these same developing regions have relatively low capacities for responding and adapting to climate shifts (particularly if they occur abruptly), and 3) that weak state institutions also create situations in which populations are more likely to use violent methods when expressing contempt for state governments. Elaborating upon susceptibility to resource alterations, the IPCC notes that the most vulnerable industries, settlements and societies are those “whose economies are closely linked with climate-sensitive resources” and explicitly denotes “[p]oor communities that depend on local food and water supplies” as being uniquely exposed.⁴¹ The UN Human Development Programme (UNDP) echoes these concerns over negative economic implications of climate change and states that “...climate change is a massive threat to human development and in some places it

³⁹ Levy, M. “Is the Environment a National Security Issue?” *International Security*, 20(2), 58, 2005.

⁴⁰ See for instance Campbell, et. al., 2007, op. cit.; Smith & Vivekananda, 2007, op. cit.; Barnett, J. “Security and Climate Change”. Tyndall Centre for Climate Change Research, Working Paper 7, 2001. Available at <http://www.tyndall.ac.uk/publications/working_papers/working_papers.html>.

⁴¹ Parry, et. al., 2007, op. cit., 12.

is already undermining the international community's efforts to reduce extreme poverty.”⁴² Such dynamics lead to indirect relationships in which the changing climate interacts with social variables to encourage or exacerbate conflict. For example, the London-based group International Alert (IA) warns that:

Hardest hit by climate change will be people living in poverty, in under-developed and unstable states, under poor governance... Many of the world's poorest countries and communities thus face a double-headed problem: that of climate change and violent conflict.⁴³

IA sees the potential for climate and conflict to create a mutually-enforcing vicious cycle in which climate change will contribute to conflicts that will in turn lead to reductions in state capacities to deal with the climate challenges.⁴⁴ Authors at the CNAS elaborate upon this concept of eroded state capacities more explicitly; discussing it as a potential conflict driver resulting from climate change. They write that:

Climate change could have deep implications for the effectiveness and viability of existing governments. Political authorities unable to manage climate-induced challenges might well lose necessary public support.⁴⁵

The CNAS goes on to claim that such erosion of public support might be manifested in violence, particularly if the demands of the marginalised groups are not being met by government institutions.⁴⁶ By combining these physical and social considerations, a model of vulnerability to climate-driven insecurity begins to emerge. States and communities reliant upon natural resources directly are inherently susceptible to the economic effects of climate change and the attendant destabilisation that such economic shocks might cause. Furthermore, if these states and communities are not well-placed to adapt and respond to the driving climate shift, then such vulnerability becomes more acute. The following section demonstrates that the Moro provinces of Mindanao exhibit important characteristics of an area at risk of climate change exacerbating conflict.

⁴² UNDP 2007, op. cit., v.

⁴³ Smith & Vivekananda, 2007, op. cit., 3.

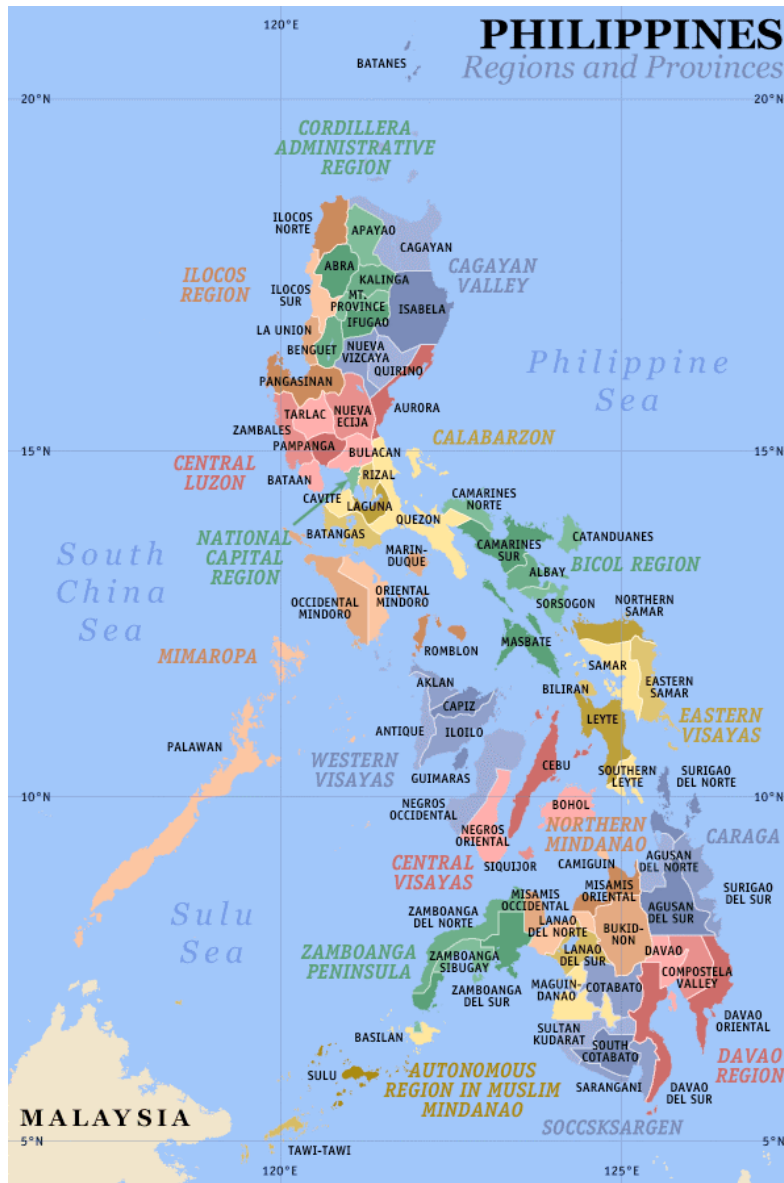
⁴⁴ Ibid.

⁴⁵ Campbell, et. al., 2007, 107.

⁴⁶ Ibid., 106-7.

2. Climate Change: A Security Risk in the Philippines?

Figure 1 Provinces and Administrative Regions of the Philippines



Source: mapsof.net. Available at <<http://mapsof.net/Philippines/static-maps/png/philippines-regions-and-provinces>>.

Conflict-prone areas in Mindanao exhibit acute physical and social vulnerability to climate change. These vulnerabilities have the potential to make volatile conflicts even more implacable, and thus should be an important factor for consideration in conflict resolution strategies. Before discussing converging vulnerabilities however, an introduction to the regional conflict is necessary. The review of historical and contemporary conflict drivers in Mindanao makes it possible to explore the potential for climate change to aggravate existing

conflict dynamics in the region.

A. Colonisation and Conflict

Mindanao has suffered a long history of unrest; with a succession of Spanish, American and Filipino administrations all unable to peacefully integrate Mindanao's Muslim populations into the rest of the archipelago over the long term.⁴⁷ Lasting over 300 years, the Spanish-Moro Wars were claimed by the late Moro Islamic Liberation Front (MILF) leader Salamat Hashim to be the longest bloody conflict in world history.⁴⁸ Despite persistent peacetime efforts to subjugate the Moro populations to Spanish rule, intertwined with long periods of active hostilities, the colonisers were never able to bring all Moro elements in Mindanao to heel.⁴⁹ The Spanish colonisers would leave an important legacy, however: Having Christian evangelism as a primary goal for their acquired territory, the colonial establishment cultivated religious antagonism between the Muslims of Mindanao and newly-converted Christian Filipinos to the north.⁵⁰ The cultural and religious dichotomies created during the centuries of Spanish rule would become important drivers of twentieth-century conflicts when large numbers of Christian Filipinos began migrating to Moro strongholds in Mindanao.

The demographic shift in Mindanao began in earnest during the period of the United States' administration of the archipelago. The US saw great opportunity in the Philippines after relieving Spain of this territorial possession at the turn of the twentieth century. With a growing need for raw materials and access to new export markets, elements of the American leadership advocated for usurping Spain as a colonial overlord instead of granting the Philippines its promised independence. As Senator Albert Beveridge declared in 1900:

The Philippines are ours forever...And just beyond the Philippines are China's illimitable markets. We will not retreat from either...Rice and coffee, sugar and coconuts, hemp and

⁴⁷ The presence of Islam what is now the southern Philippines was consolidated during the mid-fifteenth and early sixteenth centuries in the form of Muslim sultanates that ruled various parts of the modern Mindanao regions. Islam also had smaller presences in other parts of the archipelago. The important point to note here is that Islam in the Philippines predates the arrival of Christianity with Spanish colonisers.

⁴⁸ Hashim, S. *The Bangsamoro People's Struggle Against Oppression and Colonialism*, Darussalam, Camp Abubakre As-Siddique: Agency for Youth Affairs-MILF, 2001.

⁴⁹ Examples of the active hostilities referred to here include the so-called four phases of fighting lasting from 1565-1663 and over five decades of conflict starting in 1718. Towards the end of their colonial command over the archipelago the Spanish were able to establish military bases among Muslim strongholds such as Sulu, Basilan and Cotabato but still could not exert true control.

⁵⁰ Che Man, W. K. *The Moros of Southern Philippines and the Malays of Southern Thailand*. Singapore: Oxford University Press, 1990.

tobacco, and many products of the temperate as well as the tropic zone grow in various sections of the archipelago...The wood of the Philippines can supply the furniture of the world for a century to come...”⁵¹

As this statement predicts, the US administration of the Philippines saw the colonisers focus on the economic opportunities existing throughout the island chain. Despite calls from some American political circles to grant the Philippines an expedient independence, these strategic considerations would lead the United States to its most significant experience as a colonial power; which would last until the Second World War. While pursuing economic opportunities in the Philippines the American colonial administration left a lasting legacy by permanently altering the demographic and economic character of Mindanao. During the four decades of American colonial rule, the US colonial government passed multiple land laws that dispossessed the Bangsamoro and indigenous groups in Mindanao of profitable lands in favour of Filipino migrants from the north and US multinational corporations.⁵² American policies paved the way for large-scale land takeovers in Mindanao, evidenced by the existence by 1912 of 159 major plantations; 40 per cent of which were owned by US corporations, 25 per cent by predominantly northern Filipinos, and European and Chinese interests each controlling roughly 17 per cent. The legacies of land takeovers in Mindanao, which began in earnest during the American colonial years and continued after Philippine independence, remain important conflict drivers in the region.

Land takeovers in Mindanao did not subside with Philippine independence in 1946. Facing population pressures and land degradation in Luzon and the Visayas, successive governments in Manila encouraged migration to the fertile lands of Mindanao. Aggressive migration during the 1950s and 1960s permanently altered Mindanao’s demographic character and by the time of the 1975 census roughly 6 million of Mindanao’s 9.7 million people originated from Luzon or the Visayas.⁵³ Today, the Bangsamoro constitute a majority of the population in less than one-fifth of Mindanao’s 24 provinces; those of Lanao del Sur, Maguindanao, Sulu, Tawi-Tawi and Basilan. These five provinces make up the Autonomous Region of

⁵¹ Cortes, R. M., Boncan, C. P. & Jose, R. T. *The Filipino Saga*. Quezon City: New Day Publishers, 237-38, 2000.

⁵² Cagoco-Guiam, R., “Internal Migration and Security Issues and Challenges Confronting Central and Southern Mindanao” in D. F. Anwar (Ed.), *Development, Migration and Security in East Asia: People’s Movements and Non-Traditional Security Challenges in a Changing East Asia*. Jakarta: The Habibie Center, 170-4, 2005.

⁵³ May, R. J., “The Wild West in the South: A Recent Political History of Mindanao” in M. Turner, R. J. May and L. R. Turner (Eds.), *Mindanao: Land of Unfulfilled Promises*. Quezon City: New Day Publishers, 128, 1992.

Muslim Mindanao (ARMM) – see Figure 1 – which suffers from some of the lowest development levels in all of Southeast Asia.⁵⁴ The demographic shifts that began with the US administration and continued after independence have led to the minoritisation of the Bangsamoro in their ancestral lands. Hatimil Hassan, a leader of the Moro National Liberation Front (MNLF) addressed the minoritisation of the Bangsamoro in 1980 stating: “The peripherised economic conditions of the Moro minority resulting from their wholesale ouster from their lands determine the economic basis of their status as a minoritised people.”⁵⁵ Hassan claimed that minoritisation became a “root grievance” for the elements of the Bangsamoro actively rebelling against the GRP.⁵⁶

The contemporary legacy of minoritisation in Mindanao is the relative deprivation of Moro populations in comparison to the average development levels of the Philippine population. In Mindanao, relative deprivation coincides with cultural divides to lead to seemingly intractable violence. The UNDP argues that relative deprivation is the primary conflict driver in the Philippines, stating:

[M]easures of deprivation do “predict” the occurrence of armed encounters that occur across provinces. In particular, the presence or absence of basic services such as electric power, education, reliable water-supply, and road transport is an important component that feeds into whether communities regard themselves as deprived or not. The widespread and well-known availability of these services to mainstream communities serves as an adverse point of comparison for neglected and desolate areas, turning experienced hardship into palpable grievances and making people receptive to competing-state ideologies... Relative deprivation becomes more acute with minoritisation.⁵⁷

The relative deprivation and minoritisation of Moro communities have hindered peacebuilding efforts throughout the history of the Philippine state, and has been a primary driver for decades of intermittent acute violent conflict in Mindanao.

Violence has been the norm in the underdeveloped provinces of Mindanao since Philippine independence. During the bloody years between 1969 and 1976, fighting between Moro elements in Mindanao and the GRP under the Marcos administration led to an estimated toll

⁵⁴ UNDP 2005, op. cit. A selection of the development data from the AARM is forthcoming.

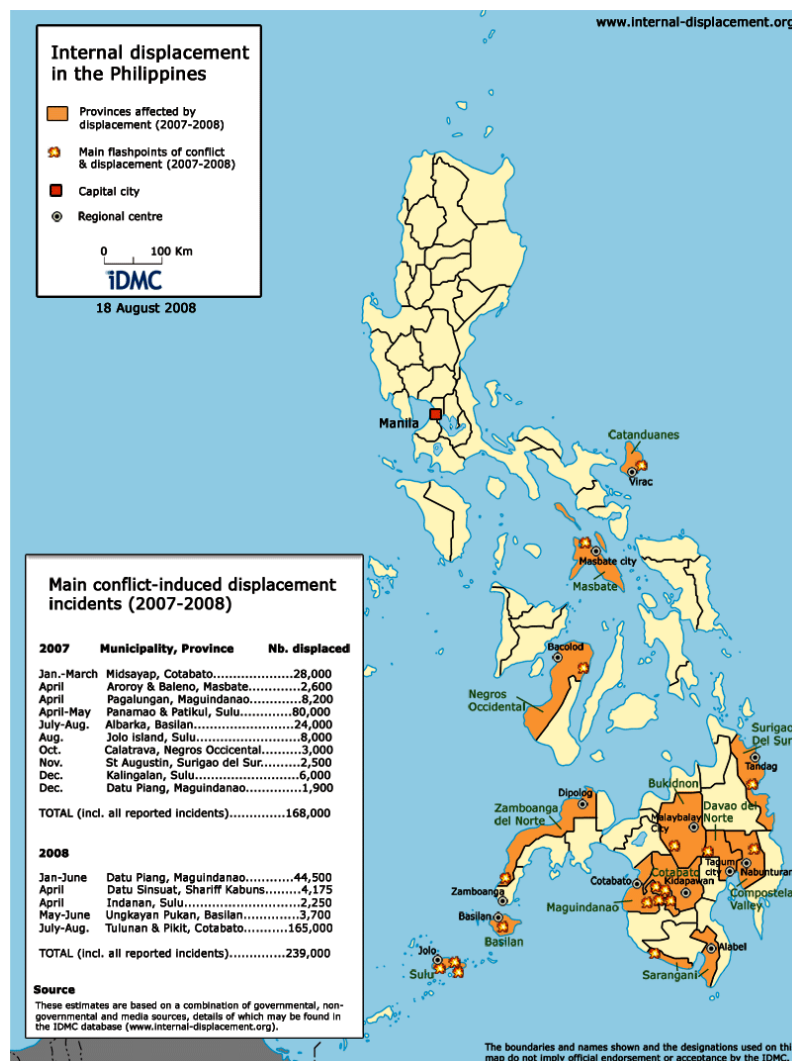
⁵⁵ Quoted in Abreu, L. M., “Ancestral Domain – the Core Issue” in Tuazon, Bobby M. ed. *The Moro Reader: History and Contemporary Struggles of the Bangsamoro People*. Quezon City: CenPEG Books, 51, 2008.

⁵⁶ Ibid.

⁵⁷ Ibid., 28.

of 60 000 dead, 54 000 wounded and 350 000 displaced.⁵⁸ The violence did not disappear with regime changes in Manila, and the World Bank estimates that a further 120 000 deaths have resulted from the Mindanao conflict from the early 1970s through 2005.⁵⁹ The economic and social implications of the conflict are difficult to measure, as it is impossible to know how much foreign and direct investment Mindanao loses due to its enduring instability, but estimates have placed the figure at between 5 and 10 billion pesos annually.⁶⁰ Violence and displacement have continued in Mindanao into 2008, as shown in Figure 2.

Figure 2 Internally displaced persons in the Philippines: 2007-2008



Source: IDMC database. Available at <www.internal-displacement.org>.

⁵⁸ United Nations Development Programme (UNDP), *Human Development Report 2007-2008: Fighting Climate Change: Human Solidarity in a Divided World*. New York: Palgrave Macmillan, 6, 2007.

⁵⁹ Schiavo-Campo, S. & Judd, M. "The Mindanao Conflict in the Philippines: Roots, Costs, and Potential Peace Dividend". Social Development Papers, Conflict Prevention and Reconstruction, Paper 24, The World Bank, 5, February 2005.

⁶⁰ UNDP 2007, op. cit., vii.

As Figure 2 shows, violent conflicts and internal displacements remain an acute problem in the Mindanao regions, particularly in regions with large Moro populations.

B. Physical Vulnerability

Given the prolonged history of fighting in Mindanao, which long predates significant anthropogenic alterations of the atmosphere, and the socioeconomic drivers of conflict such as relative deprivation and minoritisation, the links of significance between climate change and the conflict are not directly evident. Since this is an established conflict with a myriad of drivers, does climate change and its attendant environmental challenges have relevance as a potential conflict driver or impediment to peace? The answer is found in the dual vulnerabilities of the southern Philippines to both climate change and conflict.⁶¹

The Philippines fits squarely into the previously explored climate and conflict vulnerability model. Physically, the country, and Moro regions specifically, are inherently at risk to changes in climate due to their ecological character. The Philippine archipelago has a discontinuous coastline of 32 400 kilometres which is home to approximately 70 per cent of the country's 1500 municipalities.⁶² Communities along these coastlines count on coastal resources for economic opportunities such as fishing, lowland agriculture, transportation and tourism; some facets of which are also essential life support systems. Together with these coastal zones, the Philippine islands are buffered by 26 000 square kilometres of coral reefs, the second largest area in the world.⁶³ These physical characteristics lend themselves to the country's reliance on coastal fishing, which accounts for 40 to 60 per cent of the total fish catch as well as on marine resources as the primary source of animal protein.⁶⁴ The dependence upon coastal resources creates climate challenges for the Philippines as

⁶¹ The vulnerability to conflict is most readily evidenced by the country's history of persistent conflict since its independence. Its vulnerability to climate change is discussed thoroughly in Villarin, J. R. T., Loyzaga, A. Y. & La Viña, A. G. M. *In the Eye of the Perfect Storm: What the Philippines Should Do About Climate Change*. Manila Observatory Working Paper, SJC Professorial Lecture, 1-78, 2008; Guerero, L. (Ed.), *The Philippines: A Climate Hotspot, Climate Change Impacts and the Philippines*. Greenpeace Southeast Asia, Climate and Energy Campaign, 1-23, 2007.

⁶² Perez, R. T. "Assessment of Vulnerability and Adaptation to Climate Change in the Philippines Coastal Resources Sector". Natural Disaster Reduction Branch, Philippine Atmospheric, Geophysical and Astronomical Services (PAGASA), 2007.

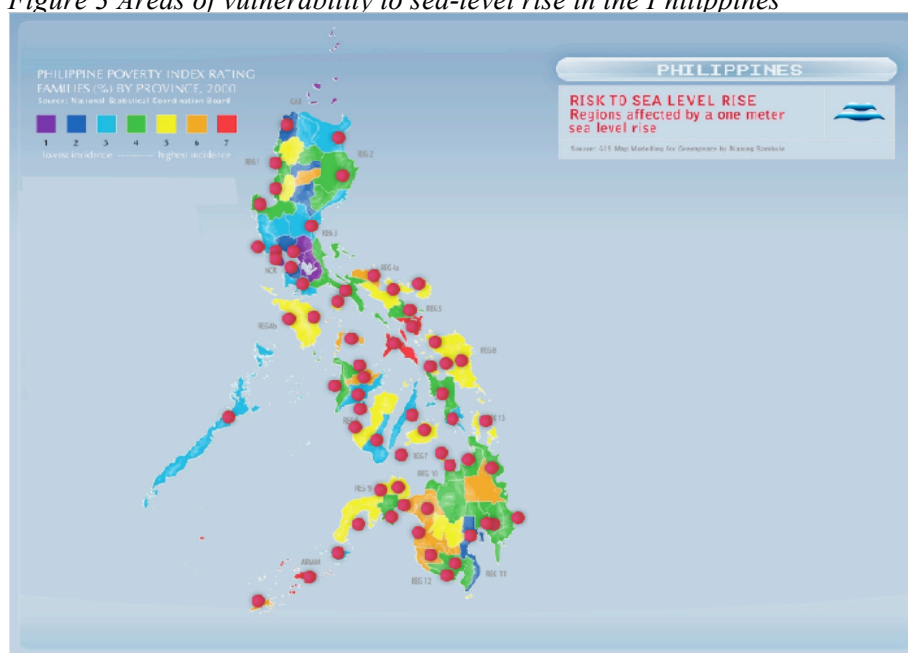
⁶³ Bureau of Fisheries and Aquatic Resources (BFAR). "Philippine Coral Reefs". Available at <http://www.bfar.da.gov.ph/infocorner/fast_facts.htm>.

⁶⁴ Perez, 2000, op. cit., 1. Perez writes that up to 70 per cent of total animal protein intake in the Philippines is derived from marine products.

escalating temperatures are predicted to be accompanied by increases in extreme ocean weather events, coastal erosion, rising sea surface temperatures and an accelerated rise in global sea levels.

Rising sea levels and increasing ocean temperatures pose particularly acute challenges for the Philippines. The AR4 provides strong evidence that increasing global temperatures are leading to rising sea levels and ocean temperatures and warns that Southeast Asia is at particular risk to coastal flooding.⁶⁵ Increasing ocean temperatures can lead to frequent coral bleaching and mortality, more frequent flooding in low-lying areas, and greater coastal wetland and mangrove degradation.⁶⁶ These higher temperatures also effect fish breeding patterns as well as plant cycles and could potentially cause an increase in the frequency and power of typhoons.⁶⁷ Sea level rise can render coastal areas uninhabitable and increase flood vulnerability. Encroaching seas also lead to saltwater intrusion, which alters the salinity of coastal ecosystems and adversely affects freshwater availability and the health of essential coastal buffers such as mangroves. Figure 3 shows areas of vulnerability to sea-level rise in the Philippines.

Figure 3 Areas of vulnerability to sea-level rise in the Philippines



Source: Greenpeace. The Philippines: A Climate Hotspot.

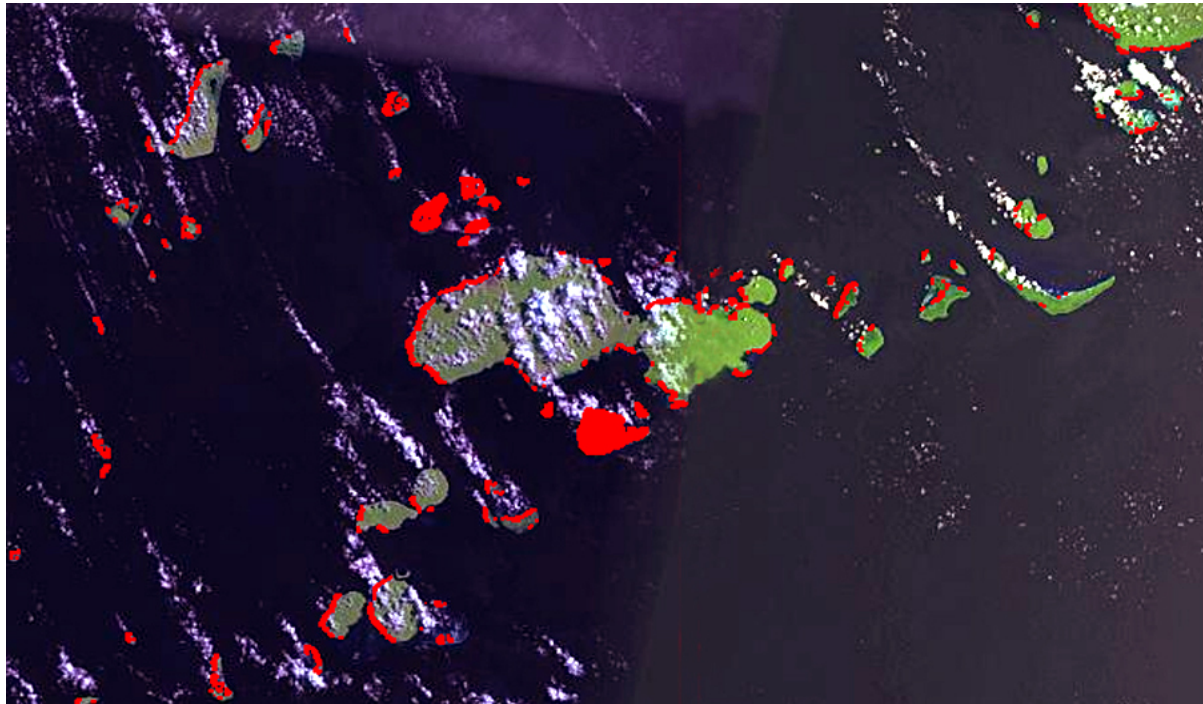
⁶⁵ IPCC, 2007, op. cit., 50.

⁶⁶ Parry, M. L., et. al., (2007), p. 12.

⁶⁷ Villarín, et. al., 2008, 17-18. The Manila Observatory, in perhaps the most extensive study on climate change and the Philippines, theorises that increased Sea Surface Temperatures (SSTs) could lead to such changes in tropical storm frequency and magnitude, as well as changes in storm tracks and seasons. The report acknowledges, however, that current trends on this subject are inconclusive.

The dots on Figure 3 indicate areas particularly threatened by an encroaching sea. Of note is that the conflict-prone provinces of Mindanao have some of the highest risk indicators in the entire country. The conflict-prone islands of Sulu are the most threatened in all of the Philippines and both ecosystems and large population centres are vulnerable to sea level rise. Figure 4 shows this scenario, with the threatened areas shaded with red.

Figure 4 Sulu's vulnerability to sea-level rise



Source: Greenpeace, The Philippines: A Climate Hotspot

In addition to these purely coastal concerns, the Philippines faces potential risks to water security and agriculture deriving from changing precipitation patterns. Increased precipitation, particularly in large-scale weather events, facilitates erosion and runoff. The IPCC predicts an increase in runoff of between 10 and 40 per cent for wet tropical regions at mid-latitudes such as the Philippines, and predicts that the negative effects of such precipitation increases will outweigh the positive.⁶⁸ The Manila Observatory forecasts “dry days that are drier and wet days that are wetter” and asserts that climatic alterations in the timing and volume of rainfall will adversely affect crop production in many of the country’s agricultural zones.⁶⁹ The El Nino phenomenon already contributes to droughts during the dry

⁶⁸ IPCC, 2007, op. cit., 49.

⁶⁹ Villarin, et. al., 2008, op. cit., 17.

season and floods during the wet, and these effects could become more acute in a changing climate.

The physical manifestations of atmospheric change, such as those threatening the Philippines, can act in conjunction to create multiple stresses that are greater than the sum of their parts.⁷⁰ For example, precipitation changes coinciding with sea-level rise and greater storm intensity could result in hydrological changes that may prove catastrophic for coastal ecosystems; along with the communities that depend on them. The overall consequences of these phenomena compound challenges to food and water security in the Philippines. Whether by affecting water quality or availability, degrading agricultural lands through drought, flooding or erosion, or rendering of entire lands unviable by an encroaching sea, atmospheric changes are problematic for the Philippines.

C. Low Adaptive Capacity

The Philippines' natural susceptibility to atmospheric changes provides only part of the country's climate vulnerability calculus. Economic and human development indicators in the Philippines, which are most dire in the already violence-prone and environmentally vulnerable regions of Mindanao, show signs of a low capacity for climate change adaptation. These development dilemmas do not stem from a lack of economic potential; the Philippines emerged from World War II with great promise. It had solidified a strong relationship with its former colonial overlord, the United States, and possessed a strategic location, growing population relatively proficient in English and wealth of resources. In the wake of the war in the Pacific theatre, the Philippines enjoyed per capita incomes twice those of Thailand and higher than both of Taiwan and South Korea. The Asian Development Bank established its headquarters in Manila during the mid-1960s, providing further evidence of confidence in the emerging Philippine economy. However, through a combination of political and economic turmoil, environmental degradation, resource mismanagement and violent insurrections, the Philippine economy has lagged behind much of the rest of the region.⁷¹ Other states in the region began incrementally surpassing the Philippines in development indicators during the 1970s as it largely missed out on the large-scale flows of manufacturing to low wage

⁷⁰ Parry, et. al., op. cit., 2007, 75.

⁷¹ For example, the ratio of the Philippines and Thailand's per capita GDP has virtually reversed. While all states are of course unique, Thailand provides an appropriate comparison given similarities in population, land size and resource bases between the two states.

countries such as China and its Southeast Asian neighbours. By the 1980s, the Philippines had become only a peripheral player in the region's trade and investment transactions.⁷² In a particularly telling indicator of the country's economic struggle, the final two decades of the twentieth century were marked by no substantial improvement in the Philippines' real per capita GDP.⁷³ Among the regions of the Philippines, those in the ARMM retain the lowest overall development indicators during this century. The region's underdevelopment contributes to a low capacity to adapt to climate change in the conflict-prone provinces of Mindanao.

Development indicators in the ARMM provide evidence for the relative deprivation of the Bangsamoro. The Moro provinces in Mindanao have some of the lowest per capita income levels and human development indexes in the country and are also failing to show improvements which have been realised in other parts of the archipelago. Table 1 shows the bottom ten provinces in contemporary real per capita income.

Table 1 Lowest real per capita income 2003 (1997 Pesos)

Bottom 10 Provinces	Real Per Capita GDP
Guimaras	17,049
Romblon	16,712
Marindugue	15,938
Sarangani	15,014
Masbate	14,454
Zamboanga del Norte	14,218
Maguindanao	14,198
Basilan	13,265
Tawi-Tawi	10,780
Sulu	8,430

Source: Philippine Human Development Report 2005

As Table 2 shows, the bottom five provinces in real per capita GDP are all located in the ARMM or on the neighbouring Zamboanga Peninsula. Tables 3 and 4 provide comparative

⁷² A. M. Balisacan & H. Hill (Eds.), *The Philippine Economy: Development, Policies, and Challenges*. Quezon City: Ateneo de Manila Press, 2003.

⁷³ Ibid.

measurements of the poverty levels of different regions from the early to late 1990s. The data for Mindanao regions is telling.

Table 2 Poverty incidence by region

Region	1991	1994	1997	1998
NCR	13.2	8.0	6.4	13.7
CAR	57.0	51.0	42.5	48.0
Ilocos Region	48.8	47.9	37.8	47.3
Cagayan Valley	48.4	35.5	32.1	38.6
Central Luzon	43.3	25.2	15.4	27.4
Southern Luzon	31.1	29.7	25.7	32.9
Bicol Region	37.9	55.1	50.1	56.9
Western Visayas	55.0	43.0	39.9	50.6
Central Visayas	45.3	32.7	34.4	43.8
Eastern Visayas	41.7	37.9	40.8	47.1
Western Mindanao	40.1	44.7	40.1	54.9
Northern Mindanao	49.7	49.2	47.0	48.6
Southern Mindanao	53.0	40.3	38.2	59.3
Central Mindanao	46.2	54.7	50.5	48.0
ARMM	50.7	60.0	57.3	63.5

Source: Amina Rasul. Poverty and Armed Conflict in Mindanao, 2003.

Table 3 Poverty rank by region

1991	1998
NCR	NCR
Southern Luzon	Central Luzon
Bicol Region	Southern Luzon
Western Mindanao	Cagayan Valley
Eastern Visayas	Central Visayas
Central Luzon	Eastern Visayas
Central Visayas	Ilocos Region
Central Mindanao	CAR
Cagayan Valley	Central Mindanao
Ilocos Region	Northern Mindanao
Northern Mindanao	Western Visayas
ARMM	Western Mindanao
Southern Mindanao	Bicol Region
Western Visayas	Southern Mindanao
CAR	ARMM

Source: Amina Rasul. Poverty and Armed Conflict in Mindanao, 2003.

While fluctuations are present in these data regarding poverty instances and rankings, the trend of underdevelopment in the Mindanao regions is clear. The ARMM regressed during the 1990s in both absolute and relative poverty terms; and this from an already highly impoverished starting point. When comparing the aggregated poverty instances in the Philippines to those in the ARMM from 1991 to 1997, one sees an approximate 8 per cent drop throughout the country compared to an almost 7 per cent increase in the Muslim autonomous region. Overall, Mindanao's contribution to the national GDP reduced from 20.4 per cent in 1981 to 18.1 per cent in 2000, and both domestic and international investment in Mindanao remain far lower than in Luzon's northern provinces. Of the 18.1 per cent contribution, roughly 1 per cent of the Philippine's GDP comes from the ARMM.

Predictably, these southern regions also fare poorly in other development indicators. The human development index aggregates factors regarding life expectancy, education and literacy and purchasing power per capita to measure and compare the quality of life of citizens in different locations. Applied to the Philippines, ARMM provinces of Basilan, Tawi-Tawi, Maguindanao and Sulu have the lowest human development ratings and Zamboanga del Norte and Lanao del Sur are also in the bottom ten.⁷⁴ To provide an international reference point, these provinces possess human development indexes similar to Cambodia, Laos and Myanmar in Southeast Asia and the African countries of Sudan, Zimbabwe and Ghana.⁷⁵ Table 4 shows that such low development levels in the ARMM are reflected in low life expectancies.

Table 4 Life expectancy in years, 2003

Bottom 10 Provinces	Years
Antique	62.6
Kalinga	62.5
Apayao	62.4
Eastern Samar	61.7
Western Samar	61.4
Basilan	60.6
Lanao del Sur	57.9
Sulu	52.8
Maguindanao	52.0
Tawi- Tawi	51.2

Source: UNDP Philippine Human Development Report 2005.

What positive development that does exist in Mindanao is scarcely realised in the Muslim-majority regions. Together Northern Mindanao and the Davao Region account for over half of Mindanao's total economic output and generate over 70 per cent of Mindanao's total exports.⁷⁶ They both have majority Christian Filipino populations. Table 5 shows poverty

⁷⁴ UNDP, 2005, op. cit., 103.

⁷⁵ Ibid., 105. The bottom three provinces have human development index ratings below the Southeast Asian neighbours listed here, while Basilan, Zamboanga del Norte and Lanao del Sur fare marginally better.

⁷⁶ Concepcion, S., Digal, L., Guiam, R., de la Rosa, R. & Stankovitch, M. "Breaking the Links Between Economics and Conflict in Mindanao". London: International Alert: Business and Conflict Programme, 2003.

incidences among Mindanao's different regions in comparison to the national poverty average. It shows that ARMM poverty levels are twice the national level in 2000.

Table 5: Poverty Incidence by Percentage of Families in Mindanao

	1991	2000
National Average	39.9	33.7
Region IX	49.7	46.6
Region X	53.0	45.7
Region XI	46.2	40.0
Region XII	57.0	51.1
ARMM	50.7	66.0

Source: International Alert. "Breaking the Links between Economics and Conflict in Mindanao", 2003.

In addition to lagging behind the rest of Mindanao economically, the Muslim majority provinces are disproportionately dependent on natural resources for their modest livelihoods. In the ARMM, agriculture, fishing and forestry accounted for 61 per cent of the region's output and employed 71 per cent of its workforce.⁷⁷ Fishing employs roughly 17 per cent of ARMM's workforce; a figure more than triple the average of other Mindanao regions. Industry, adversely, makes up a paltry 11 per cent of ARMM's economic output.⁷⁸ Its heavy direct reliance on natural resources increases the ARMM's climate vulnerability.

The development challenges in Mindanao are further compounded by the possibly detrimental positive feedbacks occurring in the interaction among environmental and social variables.⁷⁹ For example, climatic alterations leading to salt water intrusion into a low-lying coastal agricultural area can contribute to an economic decline in the said area and reduce the quality of life of the area's populace. The decline of economic production in the coastal region then enhances challenges faced by local government structures while concurrently reducing the aggregate economic revenues of the state.⁸⁰ Such deterioration would occur during a time in which the population of the coastal area faces new levels of deprivation and thus has new needs and requests of the state. In acute cases, this deprivation of the coastal

⁷⁷ UNDP, 2005, op. cit.

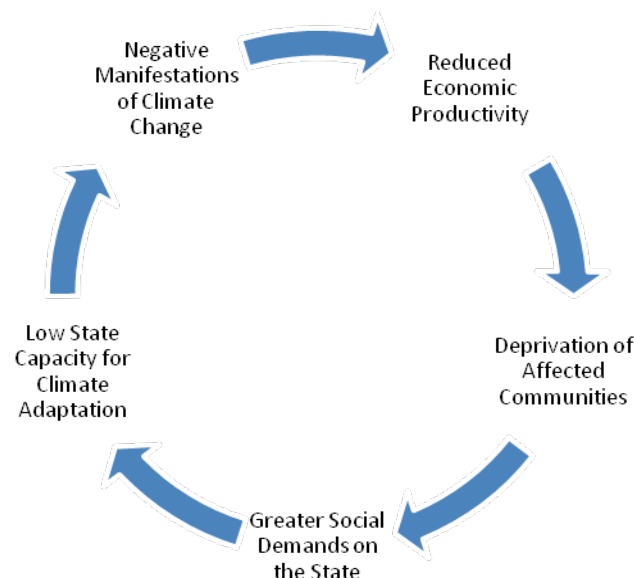
⁷⁸ Ibid.

⁷⁹ Homer-Dixon, 1999, op. cit., 25-7. Homer-Dixon discusses these positive feedbacks resulting from 'environmental stress', but his analysis remains appropriate for climate change more specifically.

⁸⁰ Ibid., and Kahl, 2007, op. cit.

community could lead to migration, friction with neighbouring communities, and/or the promotion or perpetuation of conflict.⁸¹ Inopportunately, state and local governments are then in poor condition to deal with such problems because of reduced capacities resulting from the low economic output of the affected community.⁸² If acute cases of deprivation result in significant instances of violence, then this can further erode the legitimacy and capacity of state and/or community leadership and therefore hinder efforts to address interconnected drivers such as climate change, environmental degradation and economic development. Figure 5 provides a visual representation of this dynamic.

Figure 5 Positive feedback loop for climate/social relationships⁸³



The development levels existing in the ARMM show a population directly dependent upon natural resources and economically impoverished to the point of having little capacity to adapt to changing conditions. If the natural resources that underwrite economic activity and life support systems in the ARMM are compromised, many people in the region will face extreme hardship. As the Manila observatory states:

Given that a majority of our people is mired in poverty, with livelihoods highly dependent on fragile natural resources, and living in settlements extremely vulnerable to climatic events, the Philippines finds itself in the eye of the perfect storm.⁸⁴

⁸¹ For an example of such a dynamic see Swain, A. "Displacing the Conflict: Environmental Destruction in Bangladesh and Ethnic Conflict in India". *Journal of Peace Research*, 33(2), 1996.

⁸² Homer-Dixon, 1999, op. cit.

⁸³ Figure 5 was created by the author to reflect a phenomenon discussed in climate change and conflict literature. See Smith & Vivekananda, 2007, op. cit., pp. 3-5 and pp. 8-22; and Campbell, et. al. (2007) pp. 35-55. Homer-Dixon discusses the potential for positive feedback loops linking environmental degradation and insecurity in Homer-Dixon (1999), op. cit., pp. 25-27 and 37-44.

The development deficits in the ARMM that are sources of friction between Moro populations and the GRP and will become more acute if the region's natural resource base is degraded due to climate change.

The existing conflict dynamics in Mindanao make the threats from climate change more critical. Poor Moro regions in Mindanao combine low development levels and heavy dependence upon natural resources with an inherent physical vulnerability to climate change and a history of unrest. This is particularly problematic for regions such as those in Mindanao that have been at the centre of violent insurrection against the GRP for decades. Conflict in Mindanao, as well as spill-over effects for other parts of the country and the region, could foreseeable become more difficult to address as climate change impedes future development efforts in the ARMM. Given the economic and natural realities of these areas, the deprivation gap between disillusioned segments of the Muslim population and the comparatively affluent Christian Filipino populations of Mindanao and the rest of the country could potentially widen as a result of detrimental climate shifts. Climate change thus has the capacity to further complicate an already challenging conflict resolution task in Mindanao.

The “Virtuous Cycle”: A Potential Path Forward

Despite the conclusion here that climate change appears poised to exacerbate climate dynamics in the southern Philippines, questions remain about the wisdom and efficacy of including climate and environmental considerations in conflict resolution strategies. Effective arguments can be made that such considerations are best relegated to policy spheres more suited to address them, and thus they should remain disconnected from security and conflict resolution planning.⁸⁵ Ultimately, such an argument goes, more appropriate strategies address traditional military concerns initially, basic development needs next and then move on to face climate change and attendant environmental challenges. Such arguments might assert that basic security from overt violence is essential to create the setting for economic development and so it must occur first. Such development, through enhancing a community's social, governance and infrastructure programmes, can then improve the adaptive capacity of the said community and thus lead to a greater ability to address climate

⁸⁴ Villarin, et. al., 2008, 2.

⁸⁵ See for example Deudney, D. “Environment and Security: Muddled Thinking”. *The Bulletin of the Atomic Scientists*, April 1991.

change. Underlying this logic is the intimation that climate change, being a longer term problem than the acute problems facing destabilised communities in developing regions, can wait for future efforts. While reasonable, such a rationale fails to explore the value of addressing these inter-related challenges concurrently and with an integrated strategy.

An integrated strategy is necessary to address the potential vicious cycle that can exist among climate change, social stress and insecurity (see Figure 5). The goal of an integrated strategy is to combine climate change adaptation efforts with development strategies that strengthen vulnerable communities' economic and social stability. Elaborating upon this concept, authors at IA write:

[F]ragile states face a double-headed problem: that of climate change and violent conflict. If nothing is done, the relationship between the two parts of the problem will be mutually and negatively reinforcing. There is a real risk that climate change will compound the propensity for violent conflict which, in turn, will leave communities poorer, less resilient and less able to cope with the consequences of climate change. But there is also an opportunity here: if it is targeted and appropriately addressed, this vicious circle can be transformed into a *virtuous one*. If communities can enhance their ability to adapt to consequences of climate change, this will help reduce the risk of violence. And peacebuilding activities, which address socio-economic instability and weak governance, will leave communities better placed to adapt to the challenges of climate change which, in turn, will result in more peaceful societies regardless of how climate change unfolds. Indeed, climate change offers an opportunity for peacebuilding, for it is an issue that can unite otherwise divided and unreconciled communities. It offers a threat to unite against and multiple tasks through which to cooperate...⁸⁶

The linkage between climate and peacebuilding gains relevancy through the potential positive impacts that climate adaptation measures have for societies that go beyond simply responding to climate change. As the IPCC points out, “[o]ften, planned adaptation initiatives are not undertaken as stand-alone measures, but imbedded within broader sectoral initiatives such as water resource planning, coastal defence, and risk reduction strategies.”⁸⁷

Underlying the connection between climate adaptation and security promotion is the assumption that security calculations should be considered when prioritising adaptation

⁸⁶ Smith & Vivekananda, 2007, op. cit., 8. Italics added.

⁸⁷ Parry, 2007, et. al., op. cit., 65.

strategies. Tying climate adaptation strategies to peacebuilding requires recognising social as well as environmental vulnerabilities and prioritising aggressive adaptation measures in areas exhibiting the greatest risk. Determining risk within a state requires first considering the physical vulnerabilities of an area as well as the capacity of communities within this area to deal with climate change. States also, however, should consider the security ramifications of inadequate preparatory adaptation measures in different respective regions. Such security considerations are currently under-represented in discussions on climate adaptation. A prominent example of the under-representation of security in adaptation literature is evident in the work of W. Neil Adger and his colleagues.⁸⁸ Adger is an oft-cited author who has made essential contributions to the understanding of both social and physical vulnerabilities to climate change, particularly in the developing world. Adger and his colleagues have also advocated for improving understandings of appropriate adaptation strategies and the political economy that underpins responses to climate threats.⁸⁹ However, Adger and his colleagues rarely provide more than passing attention to security considerations, and when discussing security, focus upon the capacity for climate change to foment instability. The climate and security literature explored in Section I Part D of this working paper similarly focuses upon the conflict-driving capabilities of climate change rather than possibilities for adaptation to contribute to peacebuilding strategies. Aside from the “virtuous cycle” strategy proposed by IA, the ties between peacebuilding and climate adaptation strategies remain largely unexplored.

One impediment to recognising the possibilities for connecting peacebuilding and adaptation strategies is the aggregated way in which climate change is discussed in the international arena. For example, UNFCCC efforts to address climate change, as a result of the body’s global scope, tend to focus upon national and international adaptation strategies. While UNFCCC Conferences are invaluable for international diplomatic efforts to address climate change, the globalist approach risks creating a vacuum at sub-national levels.⁹⁰ This point should not be interpreted as a criticism of the UNFCCC, but rather as a recognition of its limitations as a body tasked with negotiating global agreements. The limited attention

⁸⁸ See Adger, W. Neil (2000), “Social and ecological resilience: are they related?” *Progress in Human Geography* 24(3), pp. 347-364.; Adger, W. Neil (2003), “Social Capital, Collective Action, and Adaptation to Climate Change,” 79(4), pp. 387-404.; and Adger, W. Neil, Huq, S., Mace, M. J., and Paavola J. (Eds.) (2005), *Equity and Justice in Adaptation to Climate Change*, Cambridge, MA: MIT Press.

⁸⁹ Adger, W. Niel, Saleemul Huq, Katrina Brown, Declan Conway and Mike Hulme (2003), “Adaptation to climate change in the developing world,” *Progress in Development Studies* 3(3), p. 185.

⁹⁰ Thomas and Twyman (2005), op. cit., p. 115.

provided for intrastate needs can result in climate adaptation measures that create winners and losers amongst citizens of different regions within states.⁹¹ To minimise the presence of winners and losers in adaptation strategies, regions and communities must be prioritised based upon projected ramifications of climate-induced social strife. Security calculations are of paramount importance for anticipating such ramifications. Given the immense human and socio-economic costs of conflict, and the potential in some instances for the effects of climate change to exacerbate conflict dynamics, conflict prone areas that also exhibit climate vulnerability should be prioritised within state adaptation strategies. The dual climate and conflict vulnerabilities in Mindanao require such prioritisation.

The potential for climate adaptation measures to have ulterior social and security benefits is most pronounced in communities that are highly dependent upon natural resources for economic development and individual well-beings. Developing natural resources more sustainably, diversifying away from dependence on select resources, enhancing education on resource management and improving communication within and amongst communities in developing regions are all adaptation strategies that possess the concomitant ability to strengthen the social, political and economic fabric of the regions in which they exist. This is particularly relevant in rural settings that are highly dependent upon the traditional economic and life support systems of farming and agriculture. These possibilities are evidenced by non-climate related rural development proposals that echo strategies proposed for climate change adaptation. For example, a prominent study on rural development strategies in the Philippines concludes that sustainable land use (particularly in ecologically fragile areas), holistic approaches integrating policy, institutional, economic and technological strategies, and effective community organisations for managing resources are key elements for successful development reform.⁹² These recommendations, which originate with no intention of addressing climate adaptation, are quite consistent with IPCC adaptation strategies focusing on combining technical, behavioural, managerial and policy approaches to reduce climate vulnerability. Such measures, whether termed as traditional rural sustainability efforts or climate adaptation strategies, are valuable for improving the social fabric of developing rural communities. Smit, Pilifosova and colleagues, when addressing climate adaptation, go so far as to state that “[a]ctivities required for the enhancement of adaptive

⁹¹ Ibid. See also Kates, R. W. (2000), “Cautionary tales: adaptation and the global poor,” *Climate Change* 45, pp. 5-17.

⁹² Sajise, P. E. & Briones, N. D. *Environmentally Sustainable Rural and Agricultural Development in the Philippines: Lessons from Six Case Studies*. Los Banos, Laguna: SEMCO SEARCA, 16, 2002.

capacity are essentially equivalent to those promoting sustainable development.”⁹³ Through promoting sustainable development, climate change adaptation strategies have the potential to improve the overarching economic and social systems of vulnerable communities and, in doing so, remove some impediments to peacebuilding.

In addition to promoting sustainable development, climate adaptation measures can remove impediments to peacebuilding by promoting greater equity among and within communities. Thomas and Twyman address this possibility by first attempting to explain the interface between climate change and development and questioning whether this interface “provides an opportunity to simultaneously progress equitable development and reduced vulnerability to climate change.”⁹⁴ In answer to this question, Thomas and Twyman propose pre-emptive livelihood diversification adaptation measures as an example of a strategy for reducing the dependence of vulnerable populations upon natural resources.⁹⁵ Shifting economic structures to reduce the direct dependence of populations upon threatened natural resources, such a strategy contends, will help alleviate the inequitable receipt of climate change effects by vulnerable communities. Thomas and Twyman conclude that socio-economic vulnerabilities to climate change that are inherent to many developing communities make it essential that “equity be included within all dimensions of the climate debate.”⁹⁶ Promoting equity is particularly important given that communities most directly dependent upon natural resources are often highly economically and socially vulnerable to the effects of climate change. In such communities, effective adaptation can reduce such vulnerabilities while simultaneously improving economic conditions to lessen the marginalisation of segments of society. Improving the situations of disenfranchised elements of a population can alleviate some grievances against the state on behalf of these citizens. Adaptation programmes that can make such improvements can therefore also improve security situations.

Just as climate change does not act alone as a conflict driver, promoting progressive climate adaptation regimes in the unstable regions of Mindanao is far from a comprehensive strategy to foster peace in an area so experienced with prolonged conflict. Innumerable social,

⁹³ Smit, Barry and Olga Pilifosova, et. al. (2001), “Adaptation to Climate Change in the Context of Sustainable Development and Equity,” in McCarthy, J., Canziana, O., Leary N., Dokken, D., and White, K. (Eds.), *Climate Change 2001: Impacts, Adaptations and Vulnerability*, Cambridge: Cambridge University Press, p. 879.

⁹⁴ Thomas, David S. G. and Chasca Twyman (2005), “Equity and justice in climate change adaptation amongst natural-resource dependent societies,” *Global Environmental Change* 15, p. 117.

⁹⁵ Ibid.

⁹⁶ Ibid., p. 118

cultural, political and military considerations will also have to be addressed for a peaceful resolution to the Mindanao to be realised. However, just as this paper has shown that climate change, acting in conjunction with existing social variables, has the potential to exacerbate this conflict and impede its peaceful resolution, so too are climate adaptation strategies a relevant part of an integrated peacebuilding effort. Recognising the connections between security and climate threats does not inevitably lead to conclusions that strategies addressing these dual challenges should be integrated. The recognition of inter-related threats is, however, an essential first step towards this end.

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