Assessing the Risk of Global Climate Change on the Australian Defence Force

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MICHAEL THOMAS, MAR 8 2012

Global Climate Change (GCC) is not yet considered a major risk for the Australian Defence Force (ADF). At the sharp-end, operational force-elements remain (rightly) focused on the transition in Afghanistan, peace keeping across the Asia-Pacific and domestic disaster relief. At the strategic level, Defence planners and policy elite are pre-occupied with understanding how the coming shifts in global power will play out. These two strands of thinking converge in the 2009 ADF White Paper, *Force 2030,* where priority is on the acquisition of high-end air-maritime capabilities designed to defeat armed attack against Australia, uphold regional security and contribute niche military contingencies to broader national interests. Force restructuring to meet these objectives is now underway.

In regards to climate change however, *Force 2030* largely dismisses it as tomorrow's problem in which the strategic consequences are not felt for another twenty years. This outlook has confined GCC as a third order issue for the Australian military where it has barely garnered any interest whatsoever. The 2010-14 *Defence Environmental Plan*, by way of example, mentions the term 'climate change' as a subscript only twice in thirty-four pages. Not surprisingly, climate change has thus far failed to engender a common sense of urgency, ownership or responsibility amongst the ADF or broader military-industry sector.

In contrast, other militaries around the world have taken notice and are now acting. The UK Ministry of Defence, for example, has both a fully developed departmental GCC strategy and operational delivery plan that outlines how the military will meet a fully legislated carbon budget. The UK military has also appointed a star ranked GCC envoy whilst the US Navy has established a similar position under the title 'Task Force Climate Change'. Initiatives like the US Navy's 'Great Green Fleet'—a carrier strike group run on alternative energies—are further evidence of action. Clearly, there is more happening than *Force 2030* would have its audience believe. This article will summarise the main risks that have been overlooked by that assessment.

The Risks of GCC to the ADF

Contrary to *Force 2030*, GCC could pose significant risks to the ADF that may warrant action well before 2030. It could do this in several ways. First, GCC will require today's decision makers to consider 'future proofing' tomorrow's Defence Force against the new environmental conditions it will likely raise, train, sustain and operate in. Examples of these risks are well documented and include rising sea levels, increasing ocean acidification, increasing ocean and atmospheric temperatures, changes to rainfall patterns, increasing intensification of extreme weather events such as floods, cyclones and fires and increasing rates of glacial, polar and permafrost melting.

The impact of these risks on the ADF is not well understood. Take the expected rise in land surface temperate as an example. The Commonwealth Scientific Industrial Research Organisation (CSIRO) predicts that by 2030 annual average temperatures will have increased by 0.4 to 2.0^{o}C across most of the Australian continent. By 2070, this is expected to increase by 1.0 to 6.0^{o}C. The effects of warming will be worst in the northern reaches of Australia; precisely where the majority of the Australian Army is based, as well as a major Air Force Base (RAAF Base Tindal),

and the Royal Australian Navy's (RAN) entire patrol boat fleet. By 2030, Darwin (host to Australia's only mechanised Army Brigade) is expected to have between 28 and 69 days above 35°C. By 2070, the number of days above 35°C, on best case modelling, is estimated at 141; and, on worst case, 308. One example of the consequences of such extreme conditions would be its impact on the ability of the Defence Forces to train across a number of 'top end' locations. The inability to freely train in such conditions could degrade operational readiness. Second order impacts will also be felt on the general health and well being of both soldiers and their families residing all year round in such conditions.

More broadly, harsher environmental conditions may also affect the ability for high-end military capabilities to be maintained and operated at their peak. Although there is a degree of inbuilt 'military ruggerdisation' during testing and production, there is little available data describing how the future operating conditions will impact over the long term. Many questions arise. What, for instance, would be the impact on Australia's next generation of strike-fighter aircraft residing in open-air hangers at RAAF Tindal (near Darwin) in a 2°C warmer world? How would these temperatures affect the storage of munitions, fuel and other logistics supplies and capabilities that are currently warehoused *en plein air*? Is the single rail line that links Darwin to Adelaide (and transports many military goods and services) designed to withstand such heat stress? In short, industry will likely need to design military (and civilian) hardware solutions capable of operating under new (and harsher) environment conditions. This will require a tight coupling of the latest scientific advice into the capability planning process.

Rising sea levels pose another risk. Take the impact on the Defence Estate which encompasses one of the largest real estate portfolios in Australia, including 389 properties (including 72 significant bases), 25,000 assets and stewardship over millions of hectares of land. It is an intrinsic pillar of national security and is particularly unique by its operational longevity (indeed many sites are amongst the oldest operating in Australia). Yet, sea level rise could render many of them significantly degraded. Consider Australia's major naval base (Fleet Base East) in Sydney Harbour. Like most Naval facilities, this base is located (practically) at sea level. Even a slight sea level rise would pose a risk, particularly when combined with larger storm surges that may (in time) result from a predicted poleward shift of tropical cyclones. The costs of relocation or adaption measures on such a base would not be insignificant; the contemplated move of Fleet Base East from Sydney Harbour two hundred kilometres south to Jervis Bayin the 1980s was estimated at over $2 billion (2011 prices). Moreover, whilst the environmental impacts may not be experienced for some time, the long lead times required for new infrastructure, combined with its operational longevity (in some cases more than a century), ensures that 'future proofing' the Defence Estate should be a strong consideration well before 2030.

GCC is also likely to present new, or exacerbate existing, security threats. These risks—often referred as 'threat multipliers'—act to degrade already marginal living and/or social conditions. Such situations might result in power vacuums that are ripe for internal conflict, extremism or radical ideologies. These will be important developments that the strategic assessment agencies and ADF will need to closely follow; particularly given Australia's immediate neighbourhood is replete with states already under political and environmental stress. Consider, for example, the vulnerabilities evident in countries such as East Timor, Papua New Guinea, Fiji, Nauru, Tonga and the Solomon Islands during the previous decade. Scenarios in which fringe elements of these societies emerge to contest established power by exploiting (real or perceived) climate change induced hardships are plausible.

As organisations designed to assess future risk, the ADF would be wise to inject such GCC 'threat multiplier' scenarios into their strategic planning processes. Improved integration of climate change into the national security planning framework has been identified for some time; the extension of this analysis beyond the White Paper and into the Defence Planning Guidance (DPG) and Australian Capability Context Scenarios (ACCS) would assist the ADF to better understand whether it will have an operational role to play as climate change unfolds.

The injection of GCC into strategic planning may also reveal other, somewhat inconvenient, perspectives. One such perspective is that GCC may actually provide the ADF with a comparative advantage over neighbouring Asia-Pacific militaries. Indonesia, for example, is a country that has the majority of its infrastructure, population and fertile agricultural lands in low-lying coastal areas (140-220 million Indonesians reside within 100km of the coast). A recent report by the World Bank notes that some 15% of Indonesia's GDP is generated through coastal and marine

activities. Moreover, Indonesia is extremely vulnerable to sea level rise, salt-water intrusion and changes to the marine productive environment. Arguably, the cost of GCC adaption and/or mitigation on the Indonesian economy may drain resources that might otherwise have been directed to other areas of state; including the military. In addition, the Indonesian military may well become distracted from its core tasks by virtue of the job-at-hand as it contributes to archipelagic adaption and/or mitigation responsibilities. By this logic, the ADF may gradually gain a comparative advantage over the Indonesian military because GCC might impose costs that act as a non-zero-sum game. Such a situation is highly dependent on geography, climate vulnerability and ability for the state to implement (and afford) adaption and/or mitigation measures. Presently, there is very little analysis factoring how GCC might advantage some militaries but not others.

Contrary to this, GCC clearly introduces opportunities for strategic partnerships between nations and their militaries (independent of the cumbersome UNFCCC arrangements). As is already happening, such partnerships involve collaboration on a range of common GCC issues including establishment of regional GCC priorities, technology exchanges, financing, reporting and monitoring. Capacity building measures like these also have the potential to involve joint military activities whereby neighbouring armed forces might contribute to mutual adaption and mitigation measures. Moreover, GCC may improve inter-national relations by unifying countries (and militaries) behind a common problem. Militaries, by virtue of their ability to assess risk, prioritise, act and commit resources, should not be excluded from such partnerships.

A third risk not stated in *Force 2030* is that the ADF will face increasing political, business and community pressure to contribute directly to climate change mitigation action by reducing its own-source emissions. If the ADF fails to do this, there is a risk that it may erode public and business confidence in its ability to act as a 'force for good'—the ADF could become representative of an arcane institution unable to adapt to the requirements of a 'low carbon' economy. As the largest single Government producer of greenhouse gas emissions (approximately 60%) and the 50th largest by Australian corporate standards, the ADF is not an insignificant emitter. To place this in perspective, the ADF annual greenhouse gas output would equate to the entire national emissions of Chad, Gambia, East Timor, Nauru, the Solomon Islands and Tonga combined.

Already, other militaries are recognising the pay-off in reducing emissions. Primary amongst these is the desire to save money by reducing energy usage; thereby enabling reinvestment into other capabilities. Another important consideration is the prospect of developing alternate forms of renewable energy systems that reduce the requirement for lengthy fuel convoys. Field commanders are particularly interested in these developments, particularly given the bloody experiences in the Middle East where fuel convoys contributed to over 3,000 US civilian and military deaths between 2003 and 2007. Independence from oil price volatility ('oil shocks') and reducing reliance on non-democratic oil producing states have also been well documented since the 1970s.

The final risk overlooked by *Force 2030* regards the impact of climate change on Australian Defence Industry. Whilst the commercial sector is rapidly introducing energy efficiency measures, opportunity for Defence Industry has lagged. This is largely because the Government and Department of Defence have been slow to set sufficient goals or send the right 'market signals' to incentivise the production of low-carbon or other such prospective technologies. Room for improvement may exist through the introduction of clean energy specifications as part of the capability acquisition process. The US Navy, as an example, is well advanced on such initiatives. Witness the 2011 announcement by the Secretary of the US Navy (USN) regarding five key energy targets over the next decade. These targets include: a goal by 2020 to ensure half of the USN total energy consumption (ashore and afloat) comes from alternative energy sources and that half of its fixed installations will be energy neutral; that by 2016 the USN will sail the 'Great Green Fleet', a carrier strike group powered by a mix of nuclear, hybrid electric and biofuel technology; by 2015 the USN will cut by half the amount of petroleum in the commercial vehicle and—with effect immediately—that US Defence industry will be held contractually accountable for meeting energy efficiency targets. Such bold initiatives introduce new opportunities for the US Defence sector that have been otherwise missing-in-action for Australian Defence industries.

Conclusion

The impact of GCC on the ADF has not yet entered the public or political consciousness; hitherto debates on climate change have centred on the practical sectors that affect daily toil (agriculture, transport, manufacturing and electricity generation). Nonetheless, GCC is rapidly emerging as a risk that deserves greater scrutiny. A lack of understanding of these risks is leading to knowledge gaps that may pose strategic, institutional and operational consequences for both the ADF and Australia's national security. At the very least, planning for these risks needs to occur well before 2030.

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Michael Thomas *is a PhD candidate with UNSW (ADFA) examining the impact of climate change on Defence. He is also a currently serving member of the Australian Army. The views expressed in this paper are his own and are not those of the Department of Defence.*