

Our changing climate

Why Australians should be concerned

By

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A Galaxy poll published on 23 November 2009 suggested that while Australians favoured a carbon pollution reduction scheme, the margin of those in favour was a narrow one and the results divided broadly along lines of political support, with ALP supporters strongly in favour (63%) vs only 42% of Coalition supporters. More worrisome was the fact that only 44% of those polled thought the scheme would be a good thing. Not surprisingly the Australian Chamber of Commerce weighed in on the side of delay arguing that the emission scheme should be deferred until a global agreement is reached.

Clearly the Australian Government has much to do to convince the general public of the consequences of delay. If it was an asteroid about to hit the Earth would we be so complacent?

Climate experts and world leaders are meeting in Copenhagen over the next two weeks in a marathon meeting intended to hammer out a new deal to combat the world's changing climate. With the United States and China now willing to take the lead, progress is expected, but likely to fall well short of a new binding agreement that would make it mandatory for countries to curb – and eventually roll back – their carbon emissions.

Australia, with an emissions trading scheme in place, had hoped to play a leading and formative role at the meeting but with the EMS scheme shelved until next year, that role has been denied us and instead we will be among those countries beating our collective breasts and pledging support but without actually doing anything – yet.

Should we have risen to the challenge and put ourselves to the forefront of efforts to combat global warming? Or were we right to wait for a consensus to emerge before climbing on the bandwagon? Certainly, to move to the forefront would have been a courageous step for a nation not exactly known for its trailblazing in international diplomacy.

I would argue that it is imperative that Australia gains a seat at the top table when it comes to climate change negotiations but in order to do so we have to establish our credentials. So why should Australians be concerned? Hopefully this article will provide some food for thought.

The world's climate IS changing and at an increasingly alarming rate. Worst case predictions of a decade ago are now becoming best case scenarios. Already we are faced with higher temperatures, lower crop yields, rising sea levels and coastal inundations. Heat stress, especially among the elderly, is on the increase and threatening to reverse gains made over the last century especially in prolonging longevity with an enhanced quality of life.

According to the World Meteorological Organization, the level of atmospheric gases responsible for global warming were at an all-time high in 2008 and will be higher still in 2009 (von Bulow 2009). Atmospheric carbon and other minor "greenhouse gases", largely a product of increased energy use and – in the developing world, through forest burning to clear land for agriculture – are mainly responsible. The build-up is escalating and we may be less than 20 years away from the "tipping point", at which time change becomes irreversible. Once that happens, it is "game over."

But unlike the Hollywood movies of late where the world unites to save itself from an imminent asteroid impact, global warming is incremental. We know it is happening but because life seems normal, most of us want to wait and see. The trouble is with the lag effect. If we mend our ways now, it may still be a hundred years before the climate settles back to what it was.

That may be the most catastrophic decision humankind has ever taken. Sir Nicholas Stern, prime author of the 2006 review undertaken for the UK Government that is widely regarded as the most authoritative recent study from a global perspective, stated that the scientific evidence was now overwhelming. He summed it up by stating *there is still time to avoid the worst impacts of climate change, if we take strong action now* (Stern 2006).

The costs of taking action are far less than the costs of inaction. Again quoting from the findings of the Stern Review, for the world as a whole, an investment of one per cent of GDP per year is required to combat the worst effects of climate change. Failure to do so runs the risk of having global GDP 20 per cent lower than it otherwise would be. Indeed, such an outcome would be the largest market failure ever seen (*ibid*).

Australia faces a hotter future

Australia is already facing a hotter and drier future and as a country where 85 per cent of the population live along the coastline we will be dealing with the consequences of rising sea levels for the next few centuries at least. Yet, and as the Department of Climate Change points out in a recent report (Department of Climate Change 2009, 1), our development so far has been largely based on the assumption that the sea levels of 1788 would remain unchanged. Patently that is not going to be the case. The shape of Australia will alter as a result.

Current best guesses of the international scientific community suggest a global sea-level rise of between 1.1 and 1.2 metres (relative to 1990 levels) by the end of this century. The Australian Government's Department of Climate Change has estimated that up to \$63 billion worth of residential buildings are currently at risk.

And to sceptics who point to the fact that these are only "best guesses" it is worth pointing out again that best guesses in the past have been overtaken by events time and again.

Australia's agriculture industry too will be severely affected; crop production, pasture growth and the livestock industry will all be challenged by the changing climate. The frequency of drought will increase – becoming 20 per cent more common by 2030 over much of Australia (Department of Climate Change 2009, 2).

Asia will suffer more than most

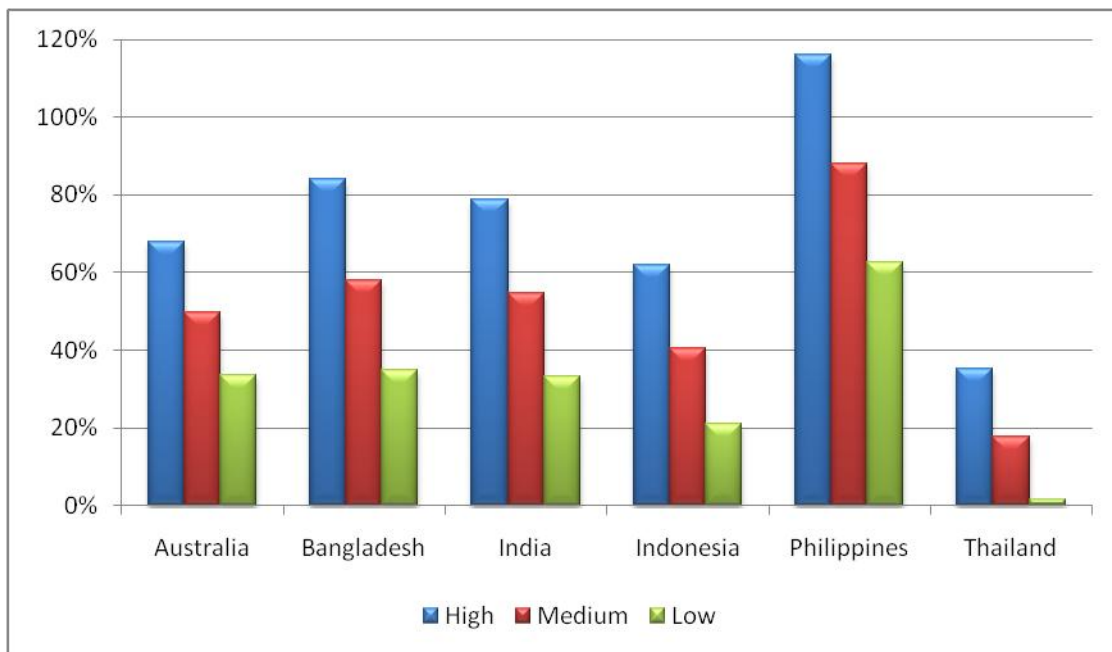
But it is to our north, in Asia, that the effects will be even more severe. The Asian landmass and its island archipelagos, is one of the most vulnerable regions to climate change because of its long coastlines, concentration of population in coastal and deltaic regions and (mostly) tropical climate.

Southeast Asia alone is home to 563 million people and its population is rising by almost two per cent annually compared to a global average of only 1.4 per cent (Asian Development Bank (ADB) 2009, 1). Using 2010 as the base year, at a two per cent annual population growth rate, Southeast Asia's population will double by 2045. Looking at Asia as a whole, population pressures are strongest in the Philippines, Bangladesh, India and Indonesia. Figure 1 provides best and worst case scenarios computed by the United Nations for Australia and selected countries of Asia.

Despite the dynamic growth of recent years throughout much of Asia, it is a region still beset by poverty. More than 50 per cent of Asia's population continues to live below the US\$2 a day poverty line and with 27 per cent below the \$1.20 a day extreme poverty level.

Asian agriculture is on a slippery slope

But while population continues to increase, Asian agriculture appears to be on a path of long-term decline as a result of climate change (ADB 2009, 2). Three commodities, rice, wheat and maize account for 95 per cent of crop production in Asia. And while the various modelling

Figure 1: Population pressures in Asia (selected countries)

Note: 2050 population estimates compared to 2000 base year, based on UN population scenarios (United Nations Population Division 2008)

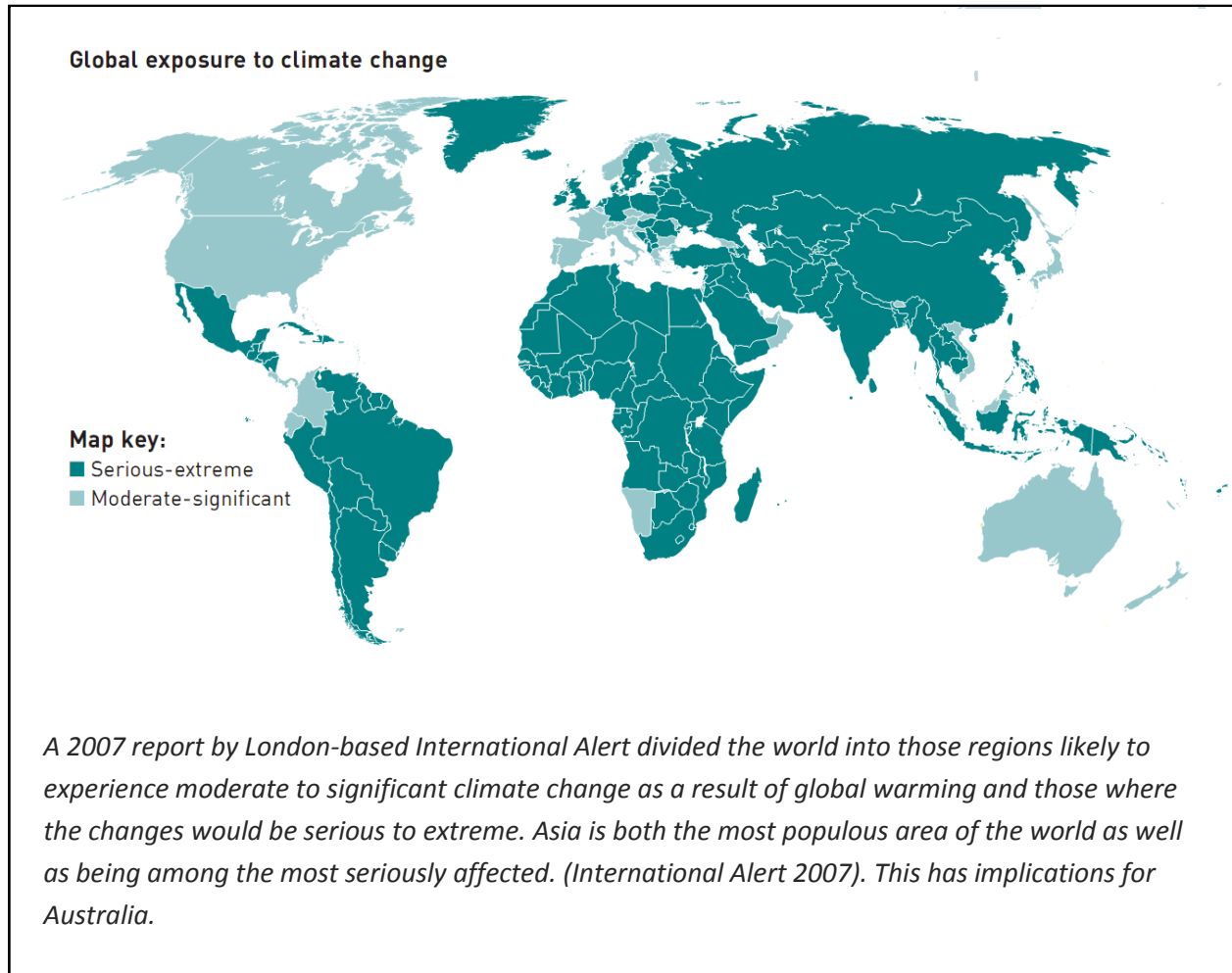
scenarios commonly used to predict impact of climate change differ in their outcomes by degree, they all point to a downward trend.¹

Rice accounts for 35 per cent of the crop in China, 82 per cent in Southeast Asia and around 46% in South Asia. India fares worst of all. The best case outcome from three common models predicts a decline in rice production of around seven per cent in India while the worst case scenario predicts a more than 20 per cent decline. For Southeast Asia, predictions range from seven per cent to 13 per cent decline. Wheat and maize show similar patterns.

It is not hard to see where this argument takes us. Daily per capita food availability is almost certain to fall. Infant mortality and child malnutrition is likely to increase.

The recent study published by the Asian Development Bank of Asian agriculture (cited above) predicts childhood malnutrition levels (which are directly linked to calorie availability) will increase dramatically to between nine and 11 million children. This is in addition to the 65

¹ The ADB in its assessment of agriculture in Asia and the Pacific compares three such scenarios, that of the CSIRO A2 scenario, Hadley A2a and NCAR (National Center for Atmospheric Research) A2



million children projected to remain malnourished by 2050 even under current climate conditions.

Warmer and drier conditions coupled to an increased frequency of what are termed “extreme weather events” will reduce the agricultural GDP of all countries of Asia but particularly in South and Southeast Asia. These countries are likely to experience a loss in agricultural GDP, worsening trade conditions and an increase, rather than a decrease, in poverty – including extreme poverty.

Climate change and migration patterns

Migration patterns within Asia and the Pacific are already considerable and likely to be exacerbated by the changing climate as land becomes less fertile and as deltaic and low-lying coastal areas become inundated either through rising sea levels or exacerbated extreme weather events including storm surges and cyclonic activity. Another recent (draft) report (ADB 2009, 3) on the implications of climate change on migration patterns suggests that by 2010, the number of environmentally displaced people at the global level could reach 50 million (citing

UNFCC 2007); that by 2050 refugees due to climate change could reach 250 million (citing Christian Aid in Bierman and Boas 2007). The Stern Review estimate that by the same time, permanently displaced “climate refugees” could reach 250 million.

The ADB migration study points out that for those with the economic capacity to do so, some of this migration will be voluntary and will represent a “coping strategy.” For others, particularly those at the lower end of the social pyramid, it will be involuntary and forced by flooding or other environmental disaster.

To this we would add a third factor, that of conflict. To study this aspect we will refer to a 2007 study by London-based International Alert “*A Climate of Conflict*” that looked at the Implications of climate change for conflict situations (International Alert 2007).

This study identifies three levels of conflict risk and two levels of exposure to climate change. The outcome for selected countries in the Asia Pacific region considering both variables are mapped into Figure 2 below to create a two-dimensional vulnerability matrix. A third dimension can also be added in the form of those countries likely to experience a heightened degree of extreme weather events (italicized) and which both amplifies the threat as well as adding to the degree of variability in some locations.

Many countries near to Australia are those in greatest peril. These include Bangladesh, India, Indonesia, Pakistan and the Philippines. Unless recognized and remedial action taken, political instability and conflict situations can only be exacerbated by climate change and the heightened competition for ever more scarce resources. If things are bad now, they will likely be even worse in years to come.

Voluntary migration will be both internal (mostly to major urban centres) or overseas to more stable countries – Australia will be regarded as a prime destination for many. Environment induced Involuntary migration can be expected to be largely internal – from one region to another as individuals make a decision to relocate and who, in doing so, will often be reliant on friends and families elsewhere. This will likely be a slow drip feed from one area to another or (as has been the case with refugees from Myanmar relocating to Thailand) across porous borders.

The third factor is the one to be concerned about. Conflict situations when they occur, often flare up unexpectedly and, very often, there is no safe haven. Ever since the first wave of boat people, mostly ethnic Chinese from Viet Nam escaping the aftermath of the war in the late 1970s, groups of people have been taking to the sea in large numbers to claim asylum elsewhere. Thirty years ago it was from Viet Nam, now it is from Sri Lanka.

Without wishing to appear alarmist, what we have seen so far may be only the tip of the iceberg, and in years to come this may be the only iceberg we will ever see. It is not an inevitability but there is a possibility of this happening and it has to be factored into Australia’s strategic response.

Figure 2: The risk matrix

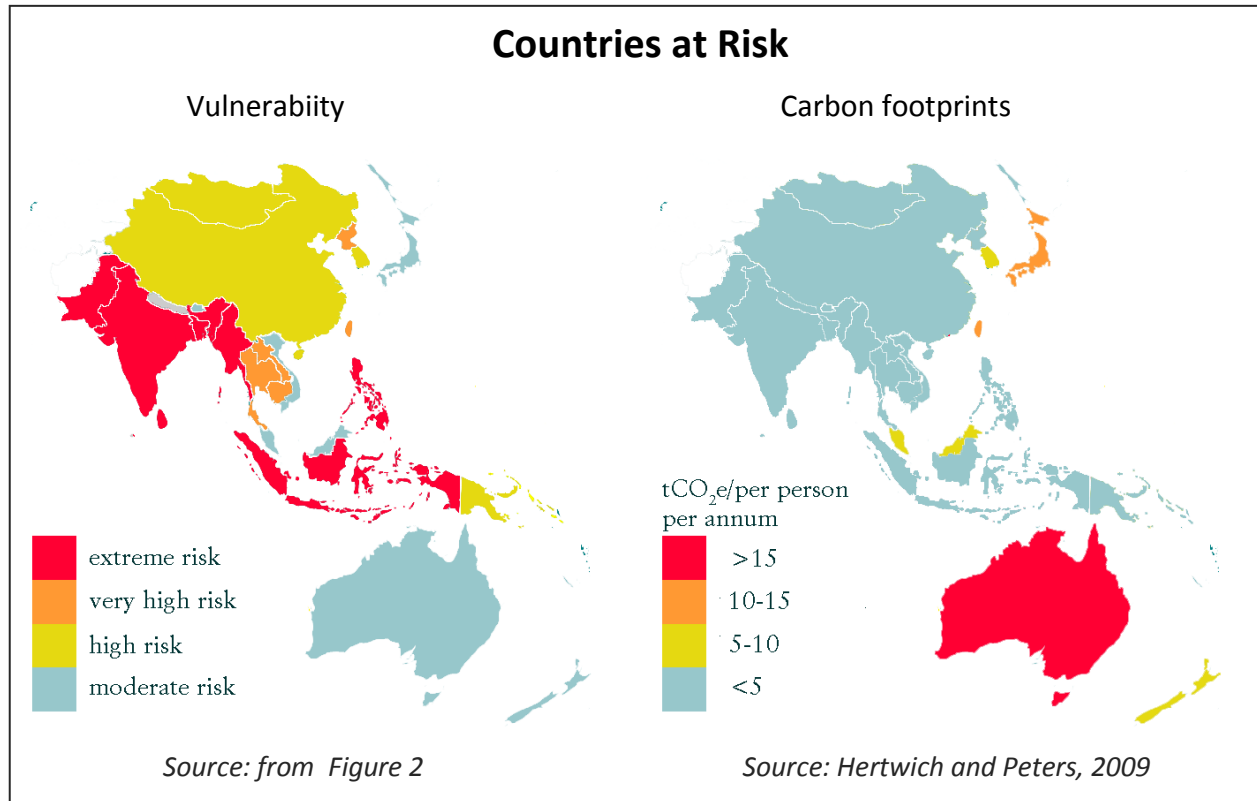
The Risk matrix		Knock on consequences of climate change		
		High risk of armed conflict	High risk of political instability	Other
Global exposure to climate change	serious/extreme	Bangladesh India Indonesia Myanmar Pakistan Philippines Sri Lanka	Cambodia DPRK (North Korea) Lao PDR Taipei, China Thailand	Mongolia China (PRC) Papua New Guinea ROK (South Korea)
	moderate/significant			Australia Japan Malaysia New Zealand Viet Nam

Source: Author, using data in *International Alert 2007*

As good as it gets

Since Donald Horne first coined the phrase, almost half a century ago,² Australia has indeed been the “lucky country”. However, this may be as good as it gets. While in the global scheme of things as a small nation our overall carbon footprint (or loosely speaking, the amount of energy we consume that releases greenhouse gases into the atmosphere) is not that great, as individuals we are among the highest carbon consumers in the world and on a par with the United States and Canada (leaving aside the oil-producing countries who have voracious energy appetites).

² Donald Horne’s book *The Lucky Country* was written in 1964



A recently published report (Herwtich and Peters, 2009) shows that for 2001, Australians each contributed 20.6 tCO₂e to atmospheric carbon, of which 82 per cent was from domestic use. In Asia, only Hong Kong residents had a higher footprint of 29.0 tCO₂e but only 17 per cent of that came from domestic sources.

The contribution of New Zealanders was the next highest at around half the Australian rate (11.4 tCO₂e), about the same as Taiwan. By comparison the footprint of people in Indonesia and the Philippines was only 1.9 tCO₂e.

This knowledge allows us to recolour our regional map (see box above). We can look through two filters; one in terms of total vulnerability (from extreme risk to moderate risk) and the other in terms of carbon footprints. The result is a telling picture.

It is in our own self-interest that we become part of the global solution. Some short-term pain may be necessary in order to reap long-term gain. It is not all downhill, or need not be, provided we recognize the problem and shift to a greener future. There are no quick fixes or easy answers but the debate cannot be held hostage to self-interest groups. All we need to do is look at the map and recognize that we need to change our ways.

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Annex: Crop scenarios

Data taken from Table 10, (ADB 2, 2009) which reports outcomes for three models: CSIRO, Hadley, and NCAR, assuming no CO₂ fertilization.

