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# Climate Change and Security in Asia: Issues and Implications for Australia

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# Climate Change and Security in Asia: Issues and Implications for Australia

**Jon Barnett**

## Introduction

The British Foreign and Commonwealth Office has recently begun talking about the challenge of 'climate security', and former United Nations Secretary General Kofi Annan has said that "Global climate change must take its place alongside the threats of conflict, poverty and the proliferation of deadly weapons that have traditionally monopolized first-order political attention". Climate change poses clear risks to Australia's interests in trade, aid and political stability in Asia. This not inconsiderable risk poses some complex challenges to Australian foreign policy. This paper explores the risks climate change poses to security in Asia and the options for Australian foreign policy.

## Climate Change

Since the industrial revolution about 200 years ago, human activities such as land clearing and the burning of oil and coal have increased the concentration of most greenhouse gases in the atmosphere. These emissions have thickened the blanket of gases that trap heat in the atmosphere, leading to warming of the atmosphere and the earth's land and ocean surfaces. In turn, this warming has meant that the atmospheric and oceanic processes that redistribute heat from the equator to the poles are becoming more vigorous. By the year 2100 global mean surface temperature is projected to increase by between 1.1 and 6.4°C, and global mean sea level is projected to rise by between 18 and 59 cm, although this latter projection excludes the possibility of increased melting from ice sheets, which would result in sea-level rise in excess of 1 meter by the end of the century.<sup>1</sup> The global hydrological cycle is likely to be more

vigorous, with the prospect of more intense climatic extremes such as heatwaves, droughts, floods and cyclones.

These changes pose myriad risks to ecosystems and the people that depend on them. The nature of risks differs according to the characteristics of social and ecological systems. Some ecosystems - such as in the Arctic - are very sensitive to changes in temperature, while others - such as northern China - are very sensitive to changes in rainfall. Still others, like low-lying coasts comprised of soft materials such as sand and silt are very sensitive to sea-level rise. Given that many small island states are entirely coastal systems with freshwater resources that are easily contaminated by saline incursion, many of these - including many of Australia's nearest neighbours - are highly at risk from the combined effects of sea-level rise, coral bleaching, more severe droughts and floods, and increased cyclone intensity. Indeed, for Kiribati, the Maldives, the Marshall Islands, Tokelau and Tuvalu, which are entirely comprised of coral atolls, climate change is their main security risk.

People are vulnerable to ecosystem changes according to their dependence on ecosystems for their livelihoods, the extent to which those ecosystems are sensitive to climate change, and their capacity to adapt to these changes. Capacity to adapt is a function of access to economic resources, technologies, information and skills, the degree of equity in a society, and the quality of governance. It generally follows that low-income people and societies are more vulnerable to climate change than wealthy people and societies. Climate change is therefore a global justice issue: the societies most responsible for the emissions of greenhouse gases are the least vulnerable because of the adaptive capacity conferred by the wealth they have generated through polluting forms of development. For example, the United States, the world's largest economy, is responsible for 30 percent of the CO<sub>2</sub> emitted between 1900 and 1999; over the same time frame, the European Union countries were responsible for 22 percent.<sup>2</sup> On a per capita basis, people in Australia, the United States, Germany, Russia and the United Kingdom are the world's largest emitters of CO<sub>2</sub>.<sup>3</sup> This context should inform Australia's responses to the security risks of climate change in Asia.

## **Climate Change in Asia: Risks and Impacts**

The latest report from the Intergovernmental Panel on Climate Change (IPCC) identifies the major impacts of climate change in Asia as being increased flood

risk in the next two to three decades as glaciers in the Himalayas melt, followed by decreased river flows as these glaciers contract. It projects long term declines in freshwater availability across most of Asia affecting more than a billion people by the year 2050, with associated impacts on agriculture. The region's mega-deltas are at risk of flooding, and many natural resources will likely become increasingly scarce. Finally, the report suggests that there will be increases in morbidity and mortality due to water borne diseases across much of the region. These and other changes are likely to slow development.<sup>4</sup>

It is expected that surface air temperatures will increase, most notably in northern latitudes and in winter temperatures. The number of hot spells is likely to increase, while the number of cold spells is likely to decrease. In South Asia research suggests an increase in summer monsoon rainfall with more severe flooding, and a decrease in winter rainfall with more severe droughts.<sup>5</sup> In China, higher annual precipitation is likely in the central and western regions, whereas in the North and Northeast annual rainfall is expected to decrease. Annual rainfall may increase in the North of Indonesia and the Philippines, but decrease to the South of Indonesia.<sup>6</sup> Across the region greater extremes of rainfall are expected while tropical cyclones may become more intense.

Sea-levels are expected to rise at an increased rate of up to 6 mm/year.<sup>7</sup> In some regions tectonic movement and ground subsidence are likely to lead to more rapid rates of relative sea-level rise, perhaps 70-90 cms by the year 2050 in the Yellow River Delta.<sup>8</sup> In the unlikely event that the West Antarctic Ice Sheet melts, sea-levels will rise rapidly by over a meter by the end of this century.

In the Yellow River catchment, declining rainfall is already exacerbating water scarcity driven by industrialisation and urbanisation, causing periodic water shortages for many of its 130 million farmers.<sup>9</sup> Increasing saltwater intrusion is already problem in many coastal areas of China, India and Bangladesh.<sup>10</sup> In the future, climate change is likely to be a far more significant driver of these water problems, including along the Yellow, Red and Mekong rivers. Rivers fed by glaciers and melting permafrost are likely to receive increased flows for some time, followed by decreased flows as the supply of water dwindles. Rivers supplied by rainfall are likely to experience increasing flow variability as rainfall events become both more intense but less frequent. These changes in flow will exacerbate flooding, water scarcity, water

pollution and water distribution (sometimes across national boundaries), presenting challenges to water resource infrastructure, water resource management, agricultural and industrial production, human health, and processes of determining equitable and sustainable allocations of water to competing users.

There is already a problem in South East Asia with forest fires that are caused by both forest fragmentation due to logging and agriculture, and dry spells in El Nino years. Such fires are likely to become more frequent due to climate change. Whether or not El Nino Southern Oscillation (ENSO) events become more intense, climate change is likely to cause more prolonged dry spells and increasing temperatures that will exacerbate the problem of forest fires and their impacts on health, production, and regional relations.

Many of Asia's cities and much of its industrial production are located in the coastal zone and on river deltas. Over 70% of China's GDP is produced in its coastal zone and this seems likely to increase.<sup>11</sup> Declining flows of sediment coupled with rising sea-levels and stronger storms may cause deltas to shrink. If so, millions of people and billions of dollars of capital may be subject to inundation and flooding. Storms and storm surges in the Bay of Bengal already causes tens of thousands of deaths; rising sea-levels, stronger storms and population growth may conspire to increase the number of lives lost in the future.

Marine species are a key source of protein throughout Asia and fisheries and aquaculture are key economic activities. Most studies suggest productivity in both types of fishery will decline due to climate change. For deep-water fisheries, the migration of species is likely to become less predictable as water temperatures are a key determinant of fish movements and the distribution of warm and cold waters may change.<sup>12</sup> Net primary productivity in tropical oceans may also decline. More unpredictable catches coupled with growing demand may see increasing exploitation and over-harvesting of fish stocks. The common property nature of high seas fish stocks complicates management of catch rates and fishing techniques. Rising sea-levels, episodes of sudden increases in sea-surface temperatures, coastal erosion, increasing salinity and increasing storm damage may all undermine production from aquaculture.

Changes in temperature and rainfall will affect food production and, in conjunction with possible impacts on fisheries and poverty, may undermine food security for Asia's poor. Production of all cereals across all of Asia is

expected to decline which, coupled with rising populations, means domestic production is likely to struggle to meet demand and lead to higher food prices. More intense droughts and floods may trigger subsistence production crises, which together with higher food prices will increase the risk of hunger and malnutrition. For example, given the existing conditions of thin soils, variable climate, political instability and rural poverty in East Timor climate change poses serious risks to nutrition and possibly famine in that country.<sup>13</sup>

Climate change is likely to have other harmful effects on human health. Outbreaks of cholera are associated with warming episodes such as occur during El Nino years, while diarrhoeal diseases are also associated with warming and flooding events.<sup>14</sup> Warming in higher latitudes also increases the risk of more intense and more extensive infection of people by malaria and dengue fever. Morbidity and mortality due to extremes events such as floods and fires are also likely to increase. Declining water quality may increase the numbers of people affected by *Giardia*, salmonella and cryptosporidium. These effects on mortality and morbidity will strain health services, demand increasing amounts of emergency assistance, and undermine labour productivity.

## **Challenges to Australian Foreign Policy**

There are two broad strategies to reduce the impacts of climate change. The first, called mitigation, entails reducing emissions of greenhouse gases, which can be achieved through switching from fossil fuel to renewable energy sources, improving energy efficiency, and, rather more contentiously, sequestering carbon in plants, underground reservoirs, and possibly in oceans, and the use of nuclear power. The second strategy to reduce the impacts of climate change is called adaptation, which entails taking measures to reduce the impacts of climate change on people, places, and sectors.

There is a widespread view internationally that Australia could and should do more in terms of mitigation. The criticism arises from Australia's hard bargaining over the final text of the 1997 Kyoto Protocol - that part of the United Nations Framework Convention on Climate Change (UNFCCC) which imposed mandatory emission reduction targets on developed countries and economies in transition. In these negotiations Australia argued that, due to its special economic characteristics, its Kyoto Protocol target should be an 8% increase in emissions beyond 1990, whereas on average other countries accepted a 5% reduction below 1990 levels. Australia also argued for a series

of 'loopholes' in measures to account for and reduce emissions.

In this stance Australia was not acting alone and was closely supported by the United States, Japan, Norway, Canada and New Zealand. However, of this group only Australia and the United States have yet to ratify the Kyoto Protocol and remain unwilling to do so, thereby attracting the ire of the international community who, having made concessions to these countries, reasonably expected that they would then ratify the Kyoto Protocol. The many critics of Australia and the United States accuse them both of undermining the legitimacy of the climate regime, and of 'free riding' on actions to reduce climate change in that they avoid incurring the costs of action but will share in the benefits of reduced emissions. For its part, the Australian Government argues that it has indeed met its Kyoto Protocol target of restricting emissions to an 8% increase beyond 1990 levels, even though it has not ratified the Kyoto Protocol.

Australia's stance on the Kyoto Protocol is a security gamble. In effect anti-Kyoto industrial and energy interests have been favoured ahead of Australia's long-term global and regional reputation. As yet climate change has not become so important that Australia's interests in the region have been obviously harmed by its anti-Kyoto position. However, as the impacts of climate change increase and become more obviously climate-related, Australia's current actions may come to be viewed more harshly. Failure to soften Australia's position on climate change could impair its influence in regional and global affairs.

The Australian Government has recently engaged in a new multilateral initiative that seeks reductions in greenhouse gas emissions. Officially announced in July 2005, the Asia-Pacific Partnership on Clean Development and Climate (AP6) involves six countries (Australia, China, India, Japan, the Republic of Korea and the United States) and seeks 'to develop, deploy and transfer cleaner, more efficient technologies and to meet national pollution reduction, energy security and climate change concerns, consistent with the principles of the UNFCCC'.



**Table 1** Members of the Asia-Pacific Partnership on Clean Development and Climate and their greenhouse gas emissions (data from UNFCCC Secretariat)

Country	Greenhouse Gas Emissions (excluding land use land-use change and forestry), Teragrams (million metric tons) of CO <sub>2</sub> equivalents	Share of world total %
United States	6894 (2003)	20.0
China	4057 (1994)	11.7
Japan	1339 (2003)	3.9
India	1214 (1994)	3.5
Australia	515 (2003)	1.5
Republic of Korea	289 (1994)	0.8

The AP6 group accounts for over 40% of global greenhouse gas emissions, close to half of world production, and 45% of the world's population (see Table 1). It also includes the largest emitters of greenhouse gases in the region (except for Indonesia whose official emissions are larger than the Republic of Korea's and unofficially - given very high rates of deforestation - may be larger than all but China's and the United States). The AP6 does not set binding emission reduction targets like the Kyoto Protocol, it includes some technologies that are much opposed in the UN climate regime - notably clean coal, carbon capture and storage, and civilian nuclear power - and it is poorly funded. The Australian government argues that AP6 is not the government's only response to Kyoto but is an alternative approach that has value as a forum for regional dialogue on emissions reduction.

The AP6 seems to most observers to be an attempt to create an alternative climate regime competing for legitimacy with the UNFCCC. In general, it has not been well received by countries outside the partnership. The AP6 may shore up Australia's relations with key Asian countries on the issue of climate change, at least in the short term. However, it should be remembered that Japan has accepted a binding emissions target under the Kyoto Protocol, that Korea, India and China have ratified, acceded or approved the Protocol, and that they are engaged in emission reduction activities with developed country partners as facilitated by the Protocol. Further, China, India and Korea may yet well accept emission reduction targets under the impending 2012 post-Kyoto agreement should the terms of the agreement and the nature of the targets be acceptable. This may be more

likely as they experience increasing climate impacts and if existing efforts demonstrate that the costs of reducing emissions are less than the benefits. In other words, beyond Australia and the United States the other countries in the AP6 are no doubt hedging their bets. So, the Australian government should not pin all its hope on the AP6 and would do well to maintain its stake in the UN climate change regime. While it seems reluctant to do this through activities to reduce emissions, it may improve its standing through actions to facilitate adaptation in Asia and elsewhere (discussed below).

## Policy Options

There are at least three broad options for a future Australian climate change policy. The first is to continue on the business as usual pathway. The second option is to increase actions to assist countries to adapt to climate change, even if no action is taken to ratify the Kyoto Protocol or otherwise adopt a binding target for emissions reductions. The third option includes significantly increased assistance for adaptation, ratification of the Kyoto Protocol, and taking a leadership role in developing an effective and credible post-Kyoto agreement. Of these, the first seems untenable given the risk of Australian isolation as perceptions of climate impacts in the region and globally grow, as international negotiations develop on a post-Kyoto agreement to include China and India, and as the U.S. political landscape changes. The following discussion concerns only the second and third options.

The second option for a future Australian climate change policy is to increase actions to assist countries to adapt to climate change. It is notable that the 2006 Aid White paper identifies adaptation to climate change as a key new area of activity. However, planning for adaptation to climate change is confounded by uncertainty as to the magnitude, timing and location of impacts. Donors such as Australia are faced with the prospect of investing scarce resources in potentially expensive solutions to meet impacts that may not materialize and whose magnitude is uncertain. A sensible adaptation strategy is therefore to develop a society's general capacity to cope with change by building up its institutional structures and human resources whilst maintaining and enhancing the integrity of ecosystems. In other words, actions to advance ecologically sustainable development can be seen as adaptations. Activities such as this have the benefit of being 'no regrets' activities that would be well received in Asia regardless of climate change. Yet such actions are not so obviously discretely 'climate change', although they could easily enough be labelled as such. Bilateral support from Australia to Asia for adaptation may be preferable to support channelled through the

financial mechanism of the UNFCCC because it tends to favour discrete projects on clearly identified climate problems rather than the kind of general sustainability activities that are required (let alone the kinds of activities that Asian countries might themselves see as priorities).

Considering the kinds of adverse outcomes of climate change suggested above, a range of projects could enhance adaptation to climate change in Asia. On the issue of rivers and water more generally, appropriate solutions vary from place to place. In the Yellow River, for example, adaptation would do well to focus less on the traditional Chinese approach of water resource infrastructure and more on managing the growing demands for water for urban and industrial users through improved efficiency and recycling and through designing institutions that can equitably balance the competing demands for water among urban, industrial and agricultural users, whilst maintaining enough flows to maintain ecosystem health. Better water management institutions are arguably needed throughout Asia, yet in some river systems gains can still be made through infrastructure improvements. In the case of the region's trans-boundary rivers, such as the Mekong and Ganges-Brahmaputra, dialogue facilitated by neutral third parties is essential to ensure peaceful co-management and sustainable allocations of water.

In terms of the problem of fires and smoke haze, adaptations include controlling the rate and nature of logging, encouraging farmers to move from shifting to settled cultivation, substituting production from native forests to plantations, better surveillance of forestry activities, and strengthened regional dialogue and cooperation on forest management and air quality. Efforts to slow the rate of deforestation are also short-term mitigation measures because forested areas are carbon sinks. This is the focus of the Australian Government's 'Global Initiative on Forests and Climate', which was announced in March 2007.

Pelagic fisheries also call for regional approaches. Better understanding is needed of fish stocks and sustainable harvesting levels. There is a need for adaptive management of pelagic as well as artisanal fisheries to monitor stocks and flows and to adjust harvesting regimes accordingly. Improved planning of coastal developments to sustain aquaculture is also desirable.

Managing the problems of coastal change requires improved institutions for coastal planning including integrated coastal zone management, accommodating likely future changes in new structures, shifting agricultural activities inland, coastal protection measures where appropriate and largely of the 'soft' (i.e. planting mangroves) kind, and controlling the nature of coastal developments so that they do not exacerbate changes that increase vulnerability to erosion and flooding.

Solutions to the risk of declining agricultural production lie in improving growing practices through more efficient irrigation technologies and extending irrigation to areas currently not irrigated. Improved soil conservation practices and careful introduction of appropriate high yielding varieties of crops can also help. Mechanisation of agriculture and land use changes to achieve economies of scale may also assist - although the impact of these changes on rural livelihoods requires careful consideration. In terms of food security, diversifying sources of rural income, early warning systems, democratisation, and subsidised food prices can all help alleviate chronic and transitory food shortages. All these are far more effective and sustainable than short-term relief in the form of food aid.

Solutions to the kinds of health problems that might arise from climate change lie in improved health services, enhanced public health campaigns, poverty reduction, improved disaster management institutions, and closer monitoring of vector-borne diseases. AusAid has a growing focus on health programs in the region, which is a 'no regrets' policy in terms of climate change. Improving disaster preparedness, response and recovery institutions is a cross cutting theme for all sectors and is clearly justifiable given that cyclones, floods and droughts already impact on development in much of Asia.

Efforts to improve the quality of governance, development, and planning in urban areas is an important adaptation strategy both to sustain urban development and to better accommodate potential influxes of migrants. Yet it is desirable that efforts in urban areas not occur at the expense of rural development lest it further exacerbates rural-urban inequality and compound the problem of rural-urban migration. Sustainable pathways to rural development are also required to build adaptable rural communities dependent on resilient ecosystems. Many of the most vulnerable rural communities are those that lack access to basic services such as clean drinking water and electricity. Rural electrification using clean energy technologies is simultaneously an efficient development, adaptation, and climate mitigation strategy.

Australia is well positioned to foster the kinds of actions required to facilitate adaptation to climate change in Asia because of its advanced agricultural technologies and knowledge, its experience with cutting edge resource management practices in the coastal zone, fisheries and water, its capacities in the areas of medicine, health care and disaster management, and its demonstrated capacity to foster regional dialogue.

The third option for a future Australian climate change policy is a Kyoto-plus strategy that combines significantly increased assistance for adaptation as described above, ratification of the Kyoto Protocol, and taking a leadership

role in developing an effective and credible post-Kyoto agreement. To be ecologically effective and politically credible, a post-Kyoto agreement must include China and India. Emissions from these two countries are already large and growing rapidly. There are many gains to be made in slowing the growth of emissions from these countries through the transfer of existing technologies. As a regional partner with China and India, Australia is in a position to take the lead in including them in a post-Kyoto regime. In so doing it could 'redeem' its reputation on this issue and in the region.<sup>15</sup>

## Conclusion

Climate change looms as a significant risk to the people, economies and political systems of Asia. It also looms as a risk to Australia's relations with the region, and this warrants a coherent regional strategy. The prospect of such a strategy now seems more likely given the dramatic change in climate (geo)politics since late 2006. Al Gore's film *The Inconvenient Truth*, Nicholas Stern's report *The Economics of Climate Change*, and the release of the IPCC's 'Fourth Assessment Report' have all raised the profile of the issue, showing that its impacts will be dramatic, and that it is economically beneficial to take actions to significantly reduce emissions. In Australia the 2006 drought and associated bushfires, and in the U.S. the impact of Hurricane Katrina have both raised the profile of climate change as a domestic political issue. It was a significant factor in the Democrat victory in the U.S. 2006 Congressional elections and will be a significant factor in both the next Presidential election in the U.S. and the next Federal election in Australia. Australia should be very concerned about being isolated by a Bush reversal on Kyoto, a Democrat President and Congress embracing the Kyoto Protocol and successor agreements, and Chinese and/or Indian adoption of an emissions reduction target in the successor agreement to the Kyoto Protocol. Given these domestic pressures in Australia, in Australia's key climate change ally in the United States, and the risk of a sudden change in sensibilities in Asia, it seems inevitable that Australia's policy on climate change will change. The issue is how, and by how much?

Given the magnitude of the risks climate change poses to human and national security in Asia, and to Australia's relations with the region, and given Australia's poor reputation on this issue, of the three policy options presented the most optimal would be the Kyoto-plus strategy. This involves significant assistance for adaptation in the region, ratification of the Kyoto Protocol, and a leadership role in developing an effective and credible post-Kyoto agreement.

## Notes

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