

**Assignment 2: Reflective Essay**  
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*Hope is the thing with feathers that perches in the soul - and sings the  
tunes without the words - and never stops at all.*

- Emily Dickenson -

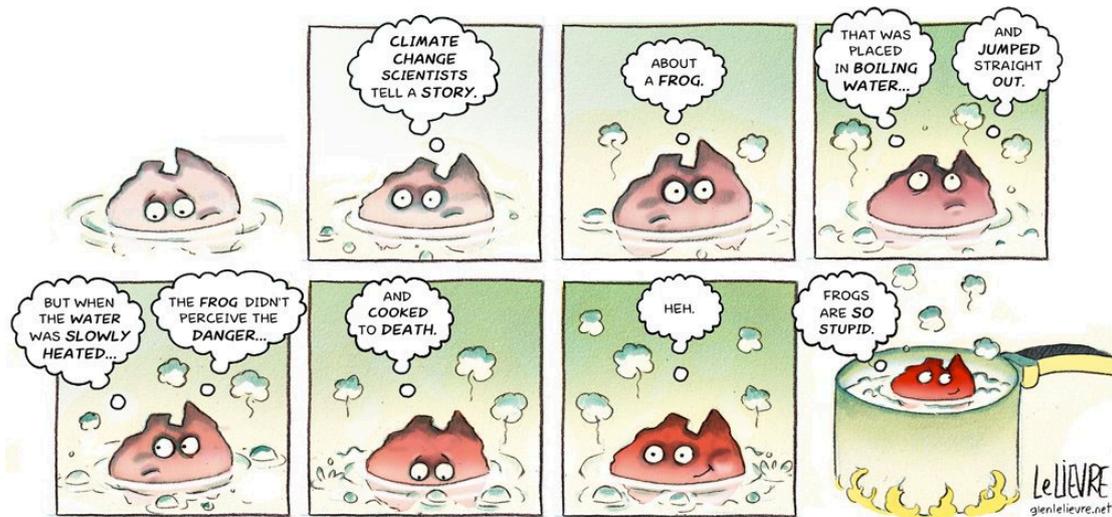


Image: Climate change cartoon from the Sydney Morning Herald  
 Image Source: <http://www.glenlelievre.net/24712/index.htm#>

## Summary

Anthropogenic climate change is not a new or unforeseen problem. Scientific data has been rapidly accumulating since Manabe and Weatherly radiative-convective model in the 1960's. Despite the array of knowledge on the broad and varied impacts of climate change, from species extinction to crop production and impacts on human health, as we approach the 50<sup>th</sup> anniversary of Manabe and Weatherly's report, action to address climate change remains limited and piece meal at best. The primary cause for inaction lies in our collective inability to rethink how we live, how we assign values on a societal level. The UNEP 2011 global survey on sustainable lifestyles summarized this as;

*'creating sustainable lifestyles means rethinking our ways of living, how we buy and what we consume but, it is not only that. It also means rethinking how we organize our daily life, altering the way we socialize, exchange, share, educate and build identities. It is about transforming our societies towards more equity and living in balance with our natural environment'*.

At a functional level, the substantial challenges climate change represents requires collective action and a sharing of information and knowledge across professional disciplines, a renaissance.

*'Natural systems underpin human livelihoods, health, welfare, food security, and prosperity.'* FINAL DRAFT IPCC WGII AR5 Chapter 14

I was at a workshop on sustainable architecture at the beginning of the year. The key speakers presentation was based on the premise that sustainable architecture doesn't yet exist, and won't until we change our values and behaviours. To paraphrase the speaker, no architecture where more, more materials, more footprint, more lighting, more pavement, more façade is required to create great design can be 'sustainable'. Perhaps unsurprisingly, this parallels the underlying theme of this course; transformational change.

It is perhaps ironic that the fastest form of change described by Daniel Botkin, behaviours, is our first and greatest stumbling block.

*"Life has had to deal with environmental change, especially climate change, since the beginning of its existence on Earth. Species adjust or go extinct, and both have happened....."* (Botkin, 2012)

Despite an increasingly large body of knowledge outlining various ways our climate is irrevocably changing, our generalised response is near inertia. Sophisticated climate models outlined in the IPCC report *The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report* (Cubasch et al, 2013) show the transformative effects of climate change. Effects are no longer predicted for some distant point, the changes have already started and will be more severe than was initially forecast. Earlier models predictions now being labelled optimistic (Hannam, 2013).

The knowledge that substantial change is looming is not new. From Manabe and Wetherald's first model there has been an increasing pool of knowledge on the cause, array and risk multiplying impacts stemming from anthropogenic climate change. There is scientific consensus that there is no resetting the natural equilibrium. So taking 1967 (the year Manabe and Weatherald's one-dimensional radioactive-convective model was published) as the ground zero of scientific knowledge on climate change, what has happened?

There appears to be a divide in awareness that runs between with 3<sup>rd</sup> and 1<sup>st</sup> world economies. Residents of 3<sup>rd</sup> world economies are more precariously connected to natural systems and more cognizant of change underway. The subsistence farmers and the poor who rely on natural systems without the protection and buffering effect of economic resources are more aware of changes like ground water levels falling and hotter and drier summers (IPCC, 2014). In contrast, residents of the 1<sup>st</sup> world economies, with our resources and distance from natural systems, can choose simply not to think about climate change in any substantive way.

For 1<sup>st</sup> world economy residents we have a mass of readily available information describing the causes, impacts and suitable responses in terms of policy and individual choices. The addition of atmospheric chemistry and land ice to climate models as well as reduced grid spacing provides more detailed climate projections with greater spatial accuracy (Cubasch et al, 2013). The use of RCP scenarios provide policy makers information to support and guide adaption and mitigation measures.

Despite this, there is a proportion of our population in 1<sup>st</sup> world economies, which unfortunately including current policy makers, who are yet to recognize that we are already living in a period of decline (Hannam, 2014). Detractors of climate change who protest under the 'modal change' banner appeal to the immutable proportion of the population. A proportion, that despite given the growing pool of knowledge latches onto any aberration or contradictory studies, stymieing real progress towards mitigation and adaption.

The ramifications of climate change have no borders and because '*natural systems underpin human livelihoods, health, welfare, food security, and prosperity*' (IPCC, 2014), all aspect of our lives will be impacted. The scale at which changes are required seems beyond our capacity to process and organize. Arguments about who and how we must adapt are rightfully framed within ideological debates on fairness. I appreciate the sentiment that encapsulates first world economies responsibility to green house gas emissions. I find it almost ironic that we must shift our priorities and behaviours away from the consumptive and materialistic focus while our corporations try to grow their market share in the emerging markets of India and China. The globalisation of economies is on one hand helping to alleviate poverty through employment while on the

other encouraging carbon-hungry behaviour based on global trade and cheap freight movement.

The issue of social justice is wound throughout climate change. It would be unfair of first world economies who's residents enjoy higher health and education outcomes attributable to the exploitation of resources, to deny the same opportunities to 2<sup>nd</sup> and 3<sup>rd</sup> world economies. To restrict their 'natural wealth' is to potentially deny these countries the same opportunities to grow and profit. Yet the ramifications if we continue are more pronounced for those poorest countries without the economic and political strength to adapt and I am doubtful that those poorest countries will generate enough wealth, political and social infrastructure to adapt before more dramatic impacts of climate change develop. Our economic and political resources allow 1st world economies, using ecological terms, to be generalists rather than specialists. We can employ what resources we have more rapidly with systems and infrastructure already in place to assist in our adaption compared with our poorer neighbours.

Some of our neighbours will be more affected than others. Low lying countries like Bangladesh will be subject to greater inundation from rising sea levels and storm surge. The fertile delta that is currently the food bowl of Bangladesh, will be subject to saline intrusion, reducing arable land and altering fish habitat and species distribution.

In other parts of Asia and Africa, poverty and from necessity born of poverty, unsustainable land use practices are the leading causes of desertification. The majority of dryland populations are in developing countries where residents are marginalized with a comparatively small political voice. Climate models suggest that precipitation patterns will change, compounding the effect of limited water supply to many of these regions. At present, in many parts of the world where demand for water is outstripping supply, water is being supplemented by groundwater extraction. This resource in many places is being over exhausted, leading to dropping water levels (IPCC 2014).

Without resources and technical aid to support agricultural production in these water-poor places, residents face an uncertain future. Food shortages exacerbate political unrest and negatively impact human health. This in turn creates more political upheaval with refugees and civil unrest a likely outcome that in turn is a causal influence on desertification and so the spiral continues.

Precipitation in our urban regions will also become a critical issue. With half the world's population living in cities and of those 1 in 3 live in slums (Rutherford, 2014). Ramanathan et al study (2005) *Atmospheric brown clouds: Impacts on South Asian climate and hydrological cycle*, found that fossil fuel emissions decreased the efficiency of precipitation and limited it in heavily polluted areas. The health impacts of living in those areas are dramatic with air pollution responsible for over a million deaths a year (Rutherford, 2014).

Increased pest and invasive weeds species may impact those areas not experiencing reduced rainfall (Davey, 2014). Traditional crops and methods of crop production are at risk. Cassava, a staple diet for many in Asia produces a substance to ward off pests that is related to cyanide and if not treated properly, can trigger its production. Rising temperatures encourage pest species with no winter 'dieback' forcing adaptation measures in plant crops. In cassava, the stress caused by pest attack stimulates the production of the cyanogen creating problems and is associated with the development of Goiter and Konzo (Bellotti, Herrera Campo, & Hyman, 2012).

Climate change has the potential to overwhelm the capacity for adaptation in many plant populations and dramatically alter their genetic composition. The ability of both flora and fauna to adapt (phenotypic plasticity), may well determine long-term survivability. Slower climate effects allowing more elongated time frames for adaptation will likely increase survivability and genetic diversity (Jump et al, 2005).

So what action do we take, knowing that our resources are finite and we need to look at loss of biodiversity, habitat destruction, dispersal of exotic species, decreased food production, shifting patterns of consumption, floods, droughts and changing wind and wave patterns to name a few of the unavoidable and unmanageable impacts (Botkin 2012). Knowing that the total carbon emissions need to be capped at 275GtC, how do we divide the carbon pie (Mackey, 2014)?

This is the nexus between science and policy. Overwhelmingly, the underlying requirement of climate change is transformation. We have created a Machiavellian plot, casting doubt on our existing economic and social systems, but have yet to see beyond the chaos of the first act, to a glimpse of something else, perhaps something better. I

heard a politician once summarise the political quandary of climate change as being 'no government has ever been elected by promising less'. He was speaking at the time about the role of the economy as a lever for behavioural change. Since that time the emission-trading scheme was shelved, the carbon tax introduced and looks set to be repealed.

Without a shift in values, I believe environmental policy to address climate change will be ineffective. The approach that we take to problems needs to be broader in scope, capturing the needs of our neighbours. Fundamental to all decisions must be an evaluation of our environmental responsibility. I am optimistic about what is yet to come; if changing our systems and lifestyles moves us from our fascination for consumption towards the intersection of prosperity, equity and sustainable lifestyle I think, very subjectively, we will all benefit from an improved quality of life.

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