UNIVERSITY OF TECHNOLOGY SYDNEY

Jumbunna Indigenous House of Learning

A Changing Climate: Indigenous Engagement with Climate Change – Impacts, Related Regulations and the Green Economy

A Briefing Paper

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INTRODUCTION

The very existence and endurance of Indigenous peoples for thousands of years on one of the driest continents on earth is a fitting starting point for this discussion on the challenges posed by climate change. From a situation 200 years ago, where the human population lived in a state of ecological harmony with and within its environment what we are now confronted by in the government's words[1] is:

"..the greatest social, economic and environmental challenge of our time. Scientific evidence confirms that human activities, such as burning fossil fuels (coal, oil and natural gas), agriculture and land clearing, have increased the concentration of greenhouse gases in the atmosphere.

As a consequence, the earth's average temperature is rising and weather patterns are changing. This is affecting rainfall patterns, water availability, sea levels, storm activity, droughts and bushfire frequency, putting at risk Australian coastal communities, health outcomes, agriculture, tourism, heritage and biodiversity for current and future generations."

When the Australian Broadcasting Corporation (ABC)[2] runs a headline quoting the prestigious 'Lancet'[3] that reads, "Climate change biggest global health threat" and continues in the body to claim that the health of billions will be affected by the adverse impacts of climate change, it is fair to assume that the issue of climate change and its impact has truly arrived.

The report by the WWF, published only the day before the ABC report deals with[4] - the threat of the coral triangle stretching from Indonesia to the Philippines being "wiped out" and setting 100 million people on the march in search of food.

In the second reading speech of the Australian Government's Carbon Pollution Reduction Scheme CPRS, the Hon. Greg Combet MP says, "The science tells us that unmitigated climate change is very likely to result in environmental and social disruption, including significant species extinctions around the globe, threats to food production and severe health impacts, with dramatic increases in morbidity and mortality occurring from heat waves, floods and droughts.

Australia is highly exposed to the impacts of climate change. The effects on Australia's environment – and economy – will be serious. The health of our population, the security of our water and energy supplies, and impacts on coastal communities and infrastructure all face unprecedented tests."

This is how serious it is.

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[1] Carbon Pollution Reduction Scheme Bill 2009, Commentary, Page 5

[2] http://www.abc.net.au/news/stories/2009/05/14/2569991.htm (14/05/09)

[3] http://www.thelancet.com/ (Managing the health effects of climate change – UCL Lancet commission report)

[4] http://news.bbc.co.uk/2/hi/science/nature/8047138.stm

The current climate change debate with its demands for urgent and immediate action is surprising only in the length of time the questions have been raised in Australia now. A report entitled Australia: State of the Environment 1996[5], to the Commonwealth Minister for the Environment, is the first ever independent nation-wide assessment of the status of Australia's environment.

The introduction reads:
"The issues addressed in the report will assist in the integrated management of our natural resources in a manner which is ecologically sustainable. All sections of the community - the general public, government decision makers and policy analysts, industry groups, natural resource planners and managers, academics and scientists, community groups and environmentalists, students and educational institutions, international agencies, and the media - will find the report an indispensable source of environmental information. The challenge is to put this information to good use."

The current debate on climate change and related regulations.. is fragmented and does not have government and community engagement.

The report goes on to say: "Global warming and other climatic changes which result from increased emissions of greenhouse gases pose a serious problem, both in terms of the direct impacts and the potential to aggravate other environmental problems such as biodiversity loss. We do not appear to be making much progress in stabilising, let alone reducing, these emissions."

The irony of the last thirteen years is that the debate has hardly progressed in that time.
So what of Indigenous people? The current debate on climate change and related regulations in Australia, the expected impact on Indigenous communities and what opportunities there may be for Aboriginal and Torres Strait Islander people is fragmented and does not have long term government and community engagement. The debate has been hijacked by media, government and business into an argument on the economic outcomes only.

The science as laid out by all the major scientific organisations in Australia and abroad is unanimous in stating that climate change is occurring and is human induced. We do not intend to debate this.
The Intergovernmental Panel on Climate Change[6] in its Fourth assessment report: Climate Change 2007 has stated that "Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations."

In plain terms this means that there is a more than 90% chance that global warming is happening due to human action. And this is the consensus finding of "experts from more than 130 countries [who] contributed to this assessment, which represents six years of work. More than 450 lead authors have

[5] http://www.environment.gov.au/soe/1996/publications/report/index.html
[6] http://www.ipcc.ch/ipccreports/assessments-reports.htm

received input from more than 800 contributing authors, and an additional 2,500 experts reviewed the draft documents. "[7]

The salient questions now are: how can Indigenous Australians begin to engage with climate change and climate change regulations. How can they minimise risks and grab the opportunities.

THE DEBATE SO FAR- GROUNDHOG DAY

Two documents bring the current state of the debate on climate change and its impacts in Australia into perspective. One is the statement by the former Prime Minister of Australia, John Howard, SAFEGUARDING THE FUTURE: AUSTRALIA'S RESPONSE TO CLIMATE CHANGE 20 NOVEMBER 1997[8]. The statement is remarkable for the muscular articulation of a policy direction that has become the only frame of reference for discussions on climate change.

"We have also made it plain that we are not prepared to see Australian jobs sacrificed and efficient Australian industries, particularly in the resources sector, robbed of their hard-earned, competitive advantage. Moreover, we have persistently stressed the need to involve developing countries as their participation is crucial to any lasting solution to the global warming problem.
These principles have guided our approach."

The bogeyman of "Australian jobs" and "Australian industries", the specter of the resources sector "robbed" of its hard earned advantage, is now off and running. Just as importantly, we are now asking "developing countries" (code for China and India) to be part of the lasting solution. This is the policy position that we see today.

As Sujatha Singh, India's High Commissioner to Australia said in a speech to the Minerals Council[9],""You cannot have an agreement whereby countries that reach a certain standard of living, a certain level of development, turn around and tell the rest of the world that what we have we get to keep; what we have, you can't even aspire to."
"We are telling you that we need to grow if we are going to give our 600 million people who live under $2 US dollars a day a decent standard of living." "Our per capita emissions will increase, there's no doubt about it." "But I am assuring you that they will never increase to what you yourselves are emitting. So you have an incentive to bring it down. Bring it down, we'll match it, we won't exceed it."

Another document that is instructive in this debate is the Australian Chamber of Commerce and Industry (ACCI) paper on "Greenhouse and Climate Change" released in December 1999. It underscores the points made by Mr. Howard in his statement above, adds the reluctance of the USA to join in any scheme, and concludes:
"The above analysis of Australia's commitments indicate that there are substantial risks for Australia in moving to implement the Protocol in the absence of international action and agreement. In focusing on our international obligations, we risk underestimating the impacts on the domestic market, which are

[7] http://www.ucsusa.org/global_warming/science_and_impacts/science/ipcc-backgrounder.html
[8] http://www.ecobusiness.com.au/grn/green.html
[9] http://petermartin.blogspot.com/2009/05/stand-by-for-lots-more-smoke.html

shaping up to be very significant but not properly understood. There is significant downside in acting in the absence of international agreement and without a full cost-benefit assessment of actions."[10]

What is instructive is to look at the submission made by ACCI to the Senate standing committee in March 2009 on the draft Carbon Pollution Reduction Scheme (CPRS). It is not surprising to see ACCI argue for a delay – the reasons given are instructive. "Therefore given current global economic slowdown, the lack of firm global commitments on climate change to date and the costs that may unfairly impose on Australian small and medium sized businesses, the resolution of the December 2008 ACCI General Council meeting called for a delay in the implementation of the operational elements of a CPRS in Australia. ACCI also considers the Government needs to consider the commencement of the CPRS in the context of actions by industrialised nations, most importantly the US. The recent US draft budget paper for fiscal year 2010 unveiled the Obama administration's intention to implement a cap and trade system to reduce greenhouse gas emissions from 2012."

So in this Groundhog Day rerun, we are back where we started. The Labor government has seemingly accepted these arguments and changed its position to be exactly in line with industry.

The market wins but who loses? How can the debate be turned around from a purely corporate economic one to one about the impact of climate change and climate change regulations on society in general, and include the disadvantaged and disenfranchised Australians in particular?

The CSIRO in its report[11] states, "Australia is one of the many global regions experiencing significant climate change as a result of global emissions of greenhouse gases (GHGs) from human activities. The average surface air temperature of Australia increased by 0.7°C over the past century – warming that has been accompanied by marked declines in regional precipitation, particularly along the east and west coasts of the continent. These seemingly small changes have already had widespread consequences for Australia."

The Native Title Report 2008 released in May 2009 by Tom Calma states[12], "It (climate change) also poses a major threat to the physical health of Indigenous communities and our ability to sustain our traditional life, languages, cultures and knowledge. Further, efforts to tackle climate change have the potential to entrench our economic marginalisation by exploiting Indigenous traditional lands, waters and natural resources 'in the national interest'."

"There is a lot at stake – and yet Indigenous Australians are often sidelined when it comes to the important work of developing policies and plans to respond to these pressing challenges. This has to change."

We are deeply alarmed by the accelerating climate devastation brought about by unsustainable development. We are experiencing profound and disproportionate adverse impacts on our cultures, human and environmental health, human rights, well-being, traditional livelihoods, food systems and food sovereignty, local infrastructure, economic viability, and our very survival as Indigenous Peoples.

[10] http://www.acci.asn.au/IssuesPapersArchiveMain.htm#1999

[11] Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions Preston, B.L. and Jones, R.N. February, 2006

[12] http://www.hreoc.gov.au/social_justice/nt_report/ntreport08/Climate_Change_Community_Guide.html

THE ANCHORAGE DECLARATION

The Indigenous People's Global Summit on Climate Change formulated the Anchorage Declaration in its gathering in Alaska. In part the Declaration states: "We express our solidarity as Indigenous Peoples living in areas that are the most vulnerable to the impacts and root causes of climate change. We reaffirm the unbreakable and sacred connection between land, air, water, oceans, forests, sea ice, plants, animals and our human communities as the material and spiritual basis for our existence.

We are deeply alarmed by the accelerating climate devastation brought about by unsustainable development. We are experiencing profound and disproportionate adverse impacts on our cultures, human and environmental health, human rights, well-being, traditional livelihoods, food systems and food sovereignty, local infrastructure, economic viability, and our very survival as Indigenous Peoples.

Mother Earth is no longer in a period of climate change, but in climate crisis. We therefore insist on an immediate end to the destruction and desecration of the elements of life."

"We offer to share with humanity our Traditional Knowledge, innovations, and practices relevant to climate change, provided our fundamental rights as intergenerational guardians of this knowledge are fully recognized and respected. We reiterate the urgent need for collective action."
There is a vast amount of research and opinion available on the topic of climate change and its impacts. In what follows a synopsis of the facts on climate change, the greenhouse effect and the predictions on global warming are presented with a view to looking at the subject from a broad Indigenous perspective.

CLIMATE CHANGE – SOME FACTS

THE GREENHOUSE EFFECT

The temperature inside a greenhouse is greater than the temperature outside it because it is designed to allow light energy in and trap the heat energy that would have reflected back. Our atmosphere[13], unlike that of some other planets, naturally acts as one such greenhouse. About a third of the incoming solar light (short-wave radiation) is reflected back into space. The remainder is absorbed by the earth which then radiates the acquired warmth as heat (long-wave radiation). Gases in the atmosphere such as water vapour, CO_2, ozone, methane, and nitrous oxide absorb some of this heat just as the greenhouse does and are thus known as greenhouse gases (GHG). Without the ability of the atmosphere to retain some of the energy in the form of heat energy, the Earth would soon cool to temperatures where human life would be untenable and unsustainable.

A natural carbon cycle[14] has regulated the carbon budget by moving it in many forms between the biosphere, atmosphere, oceans, and geosphere. An example of this cycle is the process of photosynthesis in plants, absorbing carbon from atmospheric CO_2 and thus converting it from a gas into a solid. Similarly vast quantities of carbon are stored as very dilute carbonic acid in the ocean and are used by marine biota for photosynthesis. If the quantity of greenhouse gases increases in the atmosphere as a whole – either through the carbon cycle increasing the amount of carbon released into the atmosphere from one of the other states, (gas, solid or liquid) or through an external activity – such as the human burning of fossil fuels releasing GHGs the cycle could itself drive further changes. Such a feedback loop can be seen in the melting of the permafrost due to warmer weather releasing methane trapped in the ice.

HUMAN INDUCED CLIMATE CHANGE

Ever since the industrial revolution, man has used carbon based energy to fuel economic expansion. Human activity through industry has released vast quantities of greenhouse gases, about 900 billion tonnes of CO2, of which about 450 billion tonnes has stayed in the atmosphere. About two thirds of CO2 is caused by industrialisation and the rest by land use such as deforestation. Ice core data tells us that the long term concentration of CO2 in the atmosphere is around 280 parts per million (ppm).
Charles Keeling began taking measurements of atmospheric CO_2 at the top of Mauna Loa in Hawaii from 1958. He found that the concentration of CO2 was at 318 ppm. The recording in 2008 shows this concentration is now at 387 ppm[15]. Ice core samples tell us that over the last 650,000 years, the concentration has ranged between 180 ppm and 300 ppm depending on where the earth was in its ice age cycles.

[13] http://www.cmar.csiro.au/e-print/open/holper_2001b.html
[14] http://earthobservatory.nasa.gov/Features/CarbonCycle/
[15] http://earthobservatory.nasa.gov/IOTD/view.php?id=5620

At the same time the temperature has been increasing. Average global temperatures have risen 0.76 degree C and in the same time the sea level has risen over 4cm. The twelve warmest years on record in the last 150 years have been in the past thirteen. 1998 was the warmest then 2005, 2002, 2003 and 2004. Given the evidence, most scientific organisations are of the belief that global warming is occurring and that the cause of this is human induced.

THE ALTERNATIVE VIEW

There is of course an alternate view. The arguments put forward by those who do not agree with the IPCC consensus on climate change are many and varied. They range from doubts about the very existence of global warming to questions not about the warming but about its causes.
A lot of data is available on the internet[16] and books[17] are released every week with facts, figures and graphs refuting the occurrence of climate change or the causes of climate change.
Much of the data presented as proof is indeed correct. However, subsequent review often reveals unwarranted assumptions and faulty conclusions. There are probably less certainties than we would like, and we maintain greater scientific uncertainty should lead to more concern rather than less.
As an example of the debate, one of a range of outcomes predicted at the extreme range of possibilities is the clathrate gun hypothesis[18] . The facts of the case are that clathrate is a type of ice that traps enormous quantities of methane within its crystals. It is known that there are deposits of clathrate undersea on the continental shelf. Due to the enormous depths that the methane is held in, it is in a very compressed form and one liter of the clathrate can contain around 168 liters of methane gas.
The hypothesis claims that an external event – such as warming would cause the methane to be released or shot into the atmosphere as from a gun, thus causing a huge warming event through the greenhouse effect.

While this hypothesis is discussed as part of the ongoing debate, it is not supported as a credible theory. It is one possibility at the extremes that may occur. The arguments for and against climate change can become entangled in debate over such minutiae and leave the lay person none the wiser. The burden of proof is certainly on the scientific community that claims it is happening. Any global emergency asking for massive government intervention, radical changes to the economy and a fundamental rethink of the developmental model of the last two hundred years should be treated sceptically.

SO WHAT IS TO BE DONE? WHO DO WE BELIEVE?

The consensus among the overwhelming majority of climate scientists is that the concentrations of GHGs in the atmosphere are now dangerously high. The OECD, whose data on economics is accepted, widely reported and used as a reliable source of information published a report [19] "Climate Change Mitigation – What do we do?" in 2008. To quote, "Climate change is a fact of life. We need to act urgently if we are to avoid an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially huge cost to the economy and society worldwide."

"OECD analysis suggests that if we act now, we have 10 to 15 years' "breathing space" during which action is possible at a relatively modest cost. But every year of delay reduces this breathing space, while

[16] http://www.climate-skeptic.com/2007/09/table-of-conten.html
[17] http://www.theaustralian.news.com.au/story/0,25197,25372986-30417,00.html
[18] http://www.abc.net.au/rn/ockhamsrazor/stories/2009/2577170.htm
[19] http://www.oecd.org/findDocument/0,3354,en_2649_34361_1_1_1_1_1,00.html

requiring ever more stringent measures to make a difference. Current financial turmoil is not a reason to delay. Indeed, its macroeconomic consequences will be resolved in a relatively short time, after which growth will resume, while the consequences of inaction on global warming will continue to grow more and more costly over time."

OECD pronouncements on economic matters have long ben acepted, it is prudent to do so in this instance as well.

CLIMATE CHANGE IMPACTS

There is an enormous amount of information available on the current and future impacts of climate change on the environment. The data on the impacts relates to temperature changes, rises in sea levels, changes in the acidity of oceans, ice thickness, melting rates at the Poles and other phenomena. Chapter 4 of "CLIMATE CHANGE - AN AUSTRALIAN GUIDE TO THE SCIENCE AND POTENTIAL IMPACTS" says this of the capacity for Indigenous communities to cope with these impacts: "The present social circumstances of indigenous peoples provide a poor basis on which to build adaptation responses to climate change threats. Thus, policies that aim to improve resilience to climate change impacts could encompass efforts to reduce relevant social liabilities such as poverty, poor education, unemployment, and incarceration, and support mechanisms that maintain cultural integrity. Adaptive strategies could pursue economic development of these communities while sustaining the environments on which these populations are dependent (Howitt, 1993). Strengthening communication between indigenous communities, scientists, health workers and decision-makers is essential (Baker *et al.*, 2001)."

In passing it is interesting to note that this was a publication released under the former Liberal – National's government in 2003. The issues have been set out by looking at six key areas that have a direct impact on the lives of Indigenous Australians.

1. Health
2. Water management
3. Food security
4. Extreme events
5. Populations and dislocation
6. Green jobs and opportunities

For anyone unfamiliar with the reference the current circumstances as far as Australia's Indigenous population is concerned the Productivity Commissions' ongoing research paper[20] "Overcoming Indigenous Disadvantage" is recommended. The latest edition of the report, Overcoming Indigenous Disadvantage: Key Indicators 2007 was released on 1 June 2007. Previous editions were published in 2003 and 2005.

[20] http://www.pc.gov.au/gsp/reports/indigenous

"Climate change is the biggest global health threat of the 21st century" says research conducted for the Global Health Commission by the Lancet and University College London[21].

"Effects of climate change on health will affect most populations in the next decades and put the lives and wellbeing of billions of people at increased risk. During this century, earth's average surface temperature rises are likely to exceed the safe threshold of 2°C above preindustrial average temperature. Management of the health effects of climate change will require inputs from all sectors of government and civil society, collaboration between many academic disciplines, and new ways of international cooperation that have hitherto eluded us. Involvement of local communities in monitoring, discussing, advocating, and assisting with the process of adaptation will be crucial."

The Garnaut review[22] outlines the impact on health as follows:
• Severe weather events (floods, storms, cyclones, bushfires)
• Temperature extremes, including heatwaves
• Infectious diseases (vector borne dengue virus and Ross River virus)
• Food-borne infectious diseases
• Water-borne infectious diseases and health risks from poor water quality
• Diminished food production and higher prices, with nutritional consequences
• Increases in air pollution (for example, from bushfire smoke)
• Changes in production of aeroallergens (spores, pollens), potentially exacerbating asthma and other allergic respiratory diseases
• Mental health consequences and the emotional cost of social, economic and demographic dislocation (for example, in parts of rural Australia, and through disruptions to traditional ways of living in remote Indigenous communities).

The CSIRO report, "Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions"[23], however, suggests that Australia's public health system will be able to cope well with the impact:

"Due to its relatively high adaptive capacity, the vulnerability of Australia's public health sector is relatively low, although one can identify demographic groups, such as Australia's aboriginal population, with elevated vulnerability to health challenges due to limited access to financial and public health resources.

The effects of climate change on heat related mortality suggest that increases in temperature combined with population growth may result in an increase in heat-related deaths over the next century after adjusting for decreases in cold- and ozone-related mortality. Climate change could cause large increases in flooding deaths and injuries, depending upon future changes in precipitation extremes. Climate change could cause the range of mosquito vectors for dengue and malaria to expand southward.

[21] http://www.thelancet.com/climate-change
[22] http://www.garnautreview.org.au/chp6.htm#6_3
[23] Preston, B.L. and Jones, R.N. February, 2006 – CSIRO

However, public health interventions targeting malaria during the 1960s have largely eliminated the risk of transmission and reintroduction of the disease is unlikely. In contrast, the transmission of dengue continues in Australia, although cases are largely confined to northern Queensland. Proper public health interventions may prevent substantive increases in dengue transmission. Some studies have also suggested that climate change could increase transmission of Ross River virus in regions of Australia, but less is known about the epidemiology of this disease."

So in general Australia should be able to cope. However, the people who will be most affected, according to both the Garnaut review and the CSIRO report, is the Indigenous population, principally through impacts on health, disproportionate to the general population of Australians.

Already we have seen a dengue fever outbreak of over 1000[24] cases in Australia. Of the 1001 cases, 73 have been confirmed in Townsville while the remaining 928 cases have been found in Cairns and at Innisfail, Mareeba, Port Douglas, Yarrabah and Injinoo.

In 2005, the Medical Journal of Australia[25]reported on two deaths in 2004 and said these were, "to my knowledge, the first fatalities related to dengue fever in Australia in over a century. Previous fatalities were described during a large epidemic of dengue fever in Charters Towers (north Queensland) in 1897".

"..one can identify demographic groups, such as Australia's aboriginal population, with elevated vulnerability to health challenges due to limited access to financial and public health resources."

South-west Western Australia reported over 200 cases of Ross River Virus infections early in 2009. The cause of Ross River virus (RRV) disease was confirmed in 1971 by its isolation from the blood of an Aboriginal boy with the disease. It is interesting to speculate on the reaction if the one thousand cases of dengue fever, known also as "break bone fever" occurred in metropolitan areas.

In addition to those impacts earlier listed, Indigenous Australians have suffered the effects of other phenomena: severe weather, food and water borne infectious diseases, nutritional consequences of stress on food production, and the like, especially in those climatic zones in Australia that are prone to these conditions.

WATER MANAGEMENT

As the driest inhabited continent on earth Australia and its Indigenous inhabitants have particular challenges to face. The Garnaut review (figure 6.2) talks of a 92% drop by mid

[24] http://www.cairns.com.au/article/2009/05/09/41711_local-news.html
[25] http://www.mja.com.au/public/issues/183_01_040705/mcb10834_fm.html

century in the irrigated agricultural production of the nation's breadbasket – the Murray-Darling basin. The wheat harvests of Victoria are set to fall by 25% and it is predicted that in WA "About 34 per cent additional capital expenditure will be needed to provide alternative water supplies. Over the course of the century, continued reductions in water availability will lead to increases in the cost of mining activity and temporary cutbacks in production."

The prime ministers website[26] states this about the challenge: "As the impact of climate change intensifies, Australia faces increasingly acute long-term water shortages both in our cities and regional areas – with lower rainfall, rivers drying up and dam water levels falling. Tackling the water crisis is a major long term priority for the Australian Government. Tackling the water crisis and securing our future water supply requires all Australians to work together to use water more efficiently, cut water wastage, more effectively capture rain and stormwater, and adapt to the impact of climate change."

Although there have been forecasts of decreased rainfall in many areas of Australia. Research by the CSIRO[27] predicts that by 2040, climate patterns for the eastern coast of Australia are likely to bring about more intense and more frequent extreme rainfall events. The most vulnerable regions for extreme rainfall include Coffs Harbour, Coolangatta, north of Brisbane, and over mountainous terrain (CSIRO 2004).

All the issues relating to water in Australia apply particularly to the Indigenous communities especially in regional and remote areas. Research conducted by Flinders University[28]is instructive in looking at the water management challenge as it intensifies the issues mentioned above.

The research points out that twelve communities were included in the research from Gerard in the south-east to Pukatja in the south-west. Water supply in SA is the responsibility of SA Water for all regions except the Aboriginal communities. Here historically the responsibility has sat with the State Department of Aboriginal Affairs (DOSAA, DAARE). There has only been very limited involvement of the communities themselves in the management of water and now increasingly the service has been 'outsourced' (researcher's quotes) to Water SA.

The presentation goes on to say that while supply is generally adequate, both in relation to infrastructure and supply from source, there were periods when either due to hot weather or change in levels of population. It also adds that the life of the water source is either limited or unknown. High levels of salinity, chloride, fluoride, turbidity and total hardness are common factors of water sourced and the water is treated to make it potable.

So how will this precarious scenario be impacted by climate change? If droughts are to worsen in the arid and semi-arid zones, the prognosis cannot be positive.
Robin Banks, CEO of the Public Interest Advocacy Centre said in March 2007[29], "In 1994 the Human Rights and Equal Opportunity Commission reported on 'third-world' standards of water and sanitation services in Aboriginal communities across Australia. These communities have been waiting for over ten years for Government to take urgently needed action."
The UN Committee on Economic, Social and Cultural Rights states, "The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and

[26] http://www.pm.gov.au/topics/climate.cfm
[27] More Floods, population: more on the coasts – CSIRO 2003 Dr Debbie Abbs
[28] Tom Jenkin, School of Geography, Population and Environmental Management, Flinders University 2004

[29] http://www.piac.asn.au/news/media/20070321_watersewra.html

domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements."
Without specific regional and community level research, communities are not in a position to plan and participate in water management. Research overwhelmingly points to more dryness in the drought prone areas and more floods for the wet areas of Australia. For Indigenous communities to participate, contribute and manage issues relating to water, long range studies need to be conducted with education and training being a first step towards community engagement and management of this vital issue.

FOOD SECURITY

Naturally climate change will impact on agriculture. There are some winners in this. Higher latitudes including parts of Europe and the western USA will become warmer and wetter with an extended growing season. This provides the potential for an increased level of production, though producers may need to adapt and change their agricultural techniques and the types of crops grown.
However, a number of arid and semi-arid areas may simply fall out of agricultural production. The position of food security for Indigenous Australia is in stark contrast to the rest of Australia. Neither climate change nor climate variability are new factors within agriculture. However the nature of the expected changes are graphically highlighted in the report, "THE CORAL TRIANGLE
AND CLIMATE CHANGE: ECOSYSTEMS, PEOPLE AND SOCIETIES AT RISK" released by WWF and the University of Queensland. According to this research, coral reefs could disappear entirely from the Coral Triangle region of the Pacific Ocean by the end of the century, threatening the food supply and livelihoods of about 100 million people. Thus we have a whole new level of uncertainty.

The Food and Agriculture Organization (FAO)[30] defines food security as a ''situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life''.
This definition comprises four key dimensions of food supplies: availability, stability, access, and utilisation. There is a vast amount of research available on the applicability of these criteria to the situation on food security for Indigenous communities.
The Dieticians Association of Australia (DAA)[31] states:
Even though Australia has an abundant food supply and a well-established social security safety net, there are several groups in our communities whose food security is vulnerable. They include:

- people who live in remote areas;
- all Indigenous Australians;
- homeless people;
- people on low incomes;
- disabled and aged people; and
- asylum seekers and migrants.

All Indigenous Australians.

[30] http://www.fao.org/
[31] http://www.daa.asn.au/index.asp?PageID=2145834445

The impacts are stated by the DAA as: Food insecurity has short and long term impacts on the health of individuals, families and society. People who worry about food report impaired thinking and physical ability and more illness. Food insecurity disrupts family life causing changes to eating patterns and family rituals and negatively impacts emotions and family relationships. Food insecurity also causes social disruption with increased absenteeism and reduced participation in society being reported by people who do not have food security.

So that is the scenario against which the impact of climate change on food security can be viewed. Prices and availability problems mean that access to suitable and affordable staples is still an overwhelming issue in most regional and remote communities.

In his report, "Drought, Climate Change and Food Prices in Australia", John Quiggin[32] the Australian Research Council Federation Fellow at the School of Economics and School of Political Science and International Studies, University of Queensland says, "Over coming decades, the global frequency and severity of drought is likely to increase as a result of climate change. Regional projections suggest that south-eastern Australia will be adversely affected by changes in rainfall patterns, as well as by rising temperatures, which increase the severity of drought. By 2070 there may be 40% more months of drought in eastern Australia, and conditions will be worse in a high-emissions scenario. The current drought may represent the beginning of this process. Higher average temperatures, due in part to human-caused climate change, have certainly exacerbated its impact.

Other changes, such as increases in the severity of storms, will also have adverse effects. The result for Australian consumers will be rises in average food prices and in the frequency and severity of price spikes. For foods such as fresh fruit and vegetables that are supplied mainly by local producers, price shocks similar to those being experienced by Australian consumers during the current severe drought may start to occur every two to four years, rather than once a decade, unless strong action is taken to reduce global emissions."

"The result for Australian consumers will be rises in average food prices and in the frequency and severity of price spikes."

A table he includes in his report is particularly illustrative of what communities might expect from a climate price	**Price effect of drought or other severe weather events***	**Effect of severe climate change (more than 2ºC global warming)**

[32] http://www.uq.edu.au/economics/johnquiggin/

shock. **Food category**		
Vegetables	2005–07: +33%	Locally produced products such as these are vulnerable to price spikes during local droughts. Price shocks similar to those experienced in the current drought may occur every two to four years, instead of once per decade as has been the historical norm. If some producers are unable to adjust to severe changes, permanently elevated price levels could result.
Fruit	2005–07: +43% Bananas 2005-06: +300%	
Honey	2002-03: +100%	
Bread	2005–07: +17%	Bread prices depend in part on global wheat prices. Global wheat yields are likely to decline for temperature increases of more than 3ºC (IPCC 2007). This would increase global prices and is likely to cause permanently elevated prices for bread.
Eggs	2005–07: +17%	For eggs, dairy and many meat products, water and grain for feed are important inputs. As with bread, increases of more than 3ºC would continue to drive up global grain prices, while climate change is likely to decrease water supplies. Dairy that is dependent on irrigated pasture is vulnerable to water scarcity, while native pasture capacity will decline by up to 40% for temperature increases greater than 2ºC (Preston & Jones 2006). Severe climate change is likely to cause permanently elevated prices, with further shocks during periods of drought.
Milk and dairy products	2005–07: +11%	
Meat and seafood	2005–07: +4% Lamb 2000–03: +59% Beef 2000–03: +31%	
All food products	2005-07: +12% 2002-03: +4.4%	
CPI	2005-07: +6% 2002-03: +2.7%	

Quiggin concludes, “Climate change will affect Australians in many different ways. Recent increases in grocery prices are a direct illustration of the changes that will affect the entire planet if global warming is allowed to continue unchecked. Immediate action to put Australia, and the world, on a sustainable path to the future is essential.”

Writing in the Medical Journal of Australia[33], Michael S Gracey said, “Thirty years ago, I wrote a short article entitled “Under nutrition in the midst of plenty: nutritional problems of young Australian

[33] http://www.mja.com.au/public/issues/186_01_010107/gra10660_fm.html

Aborigines." Appropriately for the time, emphasis was on childhood under nutrition, the related high infectious disease burden and the much higher mortality rates in Indigenous infants and young children than in their non-Indigenous counterparts. Awareness of these problems among health professionals and the wider community began to emerge only in the late 1960s and early 1970."
"Calls for Indigenous community fresh food scheme" reads the headline in an ABC report[34] dated May 2009. "A study published in the Medical Journal of Australia has found Indigenous people in remote communities tend to have diets high in energy-dense, nutrient-poor foods. It says people choose to fill up on these foods because they are cheaper than buying fresh fruit, vegetables and meat."
With prices expected to continue to rise well above CPI, the challenge of food security in an age of climate change takes on a new urgency.

EXTREME EVENTS

The IPCC[35] in talking of observed changes to the climate says, "At continental, regional, and ocean basin scales, numerous long-term changes in climate have been observed. These include changes in Arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones."

The National Oceanic and Atmospheric Administration[36]undertook research in relation to extreme weather events due to climate change expected in North America. Among the findings reported are that "droughts, heavy downpours, excessive heat, and intense hurricanes are likely to become more commonplace as humans continue to increase the atmospheric concentrations of heat-trapping greenhouse gases.
The report is based on scientific evidence that a warming world will be accompanied by changes in the intensity, duration, frequency, and geographic extent of weather and climate extremes."

There is no doubt as to the impact of climate change on extreme weather events in Australia.
While climate change does not create bush fires or floods what is observed is an intensification of the climate events. Droughts are longer, summers are hotter and storms are more powerful.

Indigenous communities will be particularly impacted, as we have already stated. However, little if any research has been conducted as to the specific impacts on particular communities.

Tom Calma in his recently released Native Title Report 2008 has included a chapter on climate change: "This year's report includes two case studies – one from the Torres Strait Islands and the other from the Murray-Darling Basin – which highlight the particular challenges and opportunities for Aboriginal and Torres Strait Islander communities. In different ways, they both point to the need for Australia's climate change response to protect fundamental human rights, especially the rights of those who are the most vulnerable."

[34] http://www.abc.net.au/news/stories/2009/05/17/2572647.htm?section=australia
[35] http://ipccinfo.com/extreme.php
[36] http://www.noaanews.noaa.gov/stories2008/20080619_climatereport.html

In Brewarrina is in far western NSW the temperature[37] for February, as seen on the Bureau of Meteorology website, shows a mean temperature of 35 degrees. With its mean temperature predicted to increase by two degrees over the next two decades, what are the implications of the rise in temperature for the school and the students attending school in Brewarrina?

"We see the big trees near the beach falling down. The seagrass that the dugongs eat – you used to find long patches of it – but not anymore. The corals are dying and the sand is getting swept away and exposing rock." Ron May, a Murray Island elder is quoted in Tom Calma's report.

"We see the big trees near the beach falling down. The seagrass that the dugongs eat – you used to find long patches of it – but not anymore. The corals are dying and the sand is getting swept away and exposing rock."

The ability for communities to cope with the changes is limited by the lack of community and region specific information. A long range research programme that begins to outline the impacts of severe weather events and the rise in temperature on communities is urgently required.

The combined impact of increasing sea level rise and extreme weather events is likely to result in an increasing occurrence and severity of flood surges. Research shows that with a 20cm sea level rise, water levels would likely double with a 40 cm rise, and damage costs associated with flooding would increase by up to 50%. Overall, it is now widely agreed that sea level rise will rise by 10-40cm by 2040.

[37] http://www.bom.gov.au/climate/averages/tables/cw_048015_All.shtml

DISLOCATION

The Norther Territory government's plans to scale back services currently provided to over five hundred communities by creating twenty economic hubs is a pointer to the debate that has not yet begun. Remote and regional communities have to come to terms with the fact that a changing climate may create dislocation and the loss of hard won privileges. Communities leading traditional lifestyles may be forced to aggregate as internal climate refugees into towns created for the purpose.

Given the long experience of dispossession and displacement that is the reality for Indigenous Australians climate change induced dislocation may be a chapter waiting to be written. The cycle of dispossession and resistance could easily be repeated if the threat to regional and remote communities from climate change is not taken into account and long term planning for adaptation and mitigation adopted.

Discussion on the topic of climate refugees focuses on the plight of the Carterets[38], the Maldives[39] or the fear of a hundred million hungry coral triangle dwellers[40] turning up on Australia's doorstep. These are of course legitimate fears. The story about the Carterets is particularly topical. As of 2015, the islands and atolls that make up the group are expected to have sunk below the rising sea. Their people are the first of what is expected to be a very large number of climate refugees. The Carterets Islanders received permission from PNG in 2005 to start planning their relocation and this began in 2007.

Professor Sir Muir Gray, writing in The Times[41], says that, "millions of climate refugees will disrupt the borders of even an island nation." The Institute for Environment and Human Security, a UN body, states that climate change has already created around 20 million displaced persons globally. This number is set to go up to 50 million over the next few years and reach a staggering 150 million by 2050[42].

Commissioner Calma in his report says, "Aboriginal and Torres Strait Islander people had much to contribute to mitigation efforts and in developing culture based economies in areas such as biodiversity conservation, land and water management." "It is clear that Indigenous Australians are major stakeholders in developing and advancing a national climate change policy," he said.

"This will be crucial to responding to climate change, maintaining biological diversity and preserving important ecosystems."

[38] http://solomontimes.com/news.aspx?nwID=3964
[39] http://news.bbc.co.uk/2/hi/south_asia/3930765.stm
[40] http://news.bbc.co.uk/2/hi/south_asia/3930765.stm
[41] http://www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article6355257.ece
[42] http://news.nationalgeographic.com/news/2005/11/1118_051118_disaster_refugee.html

This engagement should be driven from within Indigenous Australia. The prospect of climate change related dislocation from country, extreme weather events, even poorer health outcomes and further economic marginalisation cannot be passively tolerated.

Engagement has to be active and the agenda for the debate must be set by Indigenous Australians along with governments. The debate on climate change impact should take into account the following key topics:

- A whole of government plan to tackle impacts on well being, health and economy
- Inclusion of indigenous people in the North Australia Taskforce as equal economic participants
- Provision of information on impacts, risks and opportunities
- Regional data collection and impact analysis
- Long term planning for the future of communities : planning for disaster mitigation and emergency response – storms, floods etc
- Discussion on the long term availability and affordability of energy
- Regional water management plans
- Assessment of green projects capacity (including region specific assessments)

Only by taking a generational view of the issues that climate change raises can the impacts be planned for with mitigation and adaptation strategies being adopted for the very long term.

"To date, however, there has been little attempt to foster genuine, coordinated and sustained participation by Aboriginal and Torres Strait Islander peoples. If we move now to ensure that Aboriginal and Torres Strait Islander peoples are actively engaged in all levels of management and decision-making that affect their livelihoods and communities, we can benefit from Indigenous traditional knowledge, land management and conservation practices."

THE GREEN ECONOMY AND OPPORTUNITIES

Having looked at the some of the risks that climate change is predicted to create, we now look at the opportunities that may arise out of the regulations that will govern national and international efforts.

In the last few years the green economy has been much heralded and the green collar job is very much part of the news. Opportunities with regard reforestation and renewable energy are daily touted as the fast-approaching tomorrow that will not only take us away from the polluting carbon based economy, but also in the process create jobs.

To understand the scope and size of the predicted changes arising out of a green economy it is instructive to look at what is meant by green jobs and where these exist today. The United Nations Environment Programme in its 2008 report, *Green Jobs: Towards Sustainable Work in a Low Carbon World*[43], defines green jobs as, "We define green jobs as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality.

Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution."

The creation of these jobs takes many forms.

- The most simple of these is the transformation of existing and current jobs as technology changes and environmentally beneficial practices are taken up by existing occupations and businesses. Plumbers, electricians, construction workers are examples where we can see this happening already. Green plumbers and green electricians are already very much part of the trade. The Green Building Council of Australia[44]says it is its mission to develop a sustainable property industry for Australia and drive the adoption of green building practices through market-based solutions. Its key objectives are to drive the transition of the Australian property industry towards sustainability by promoting green building programs, technologies, design practices and operations as well as the integration of green building initiatives into mainstream design, construction and operation of buildings.
- Renewable energy – wind, solar, bio-mass, geothermal, wave, etc, will lead to new energy jobs replacing old, highly-polluting jobs. The Climate Institute research says $31 billion worth of clean energy projects already in the pipeline, many in regional areas, will generate 2500 permanent jobs, 15,000 construction jobs and 8600 associated positions. These do not include jobs in household solar hot water systems or insulation and base their numbers on surveying investors rather than modeling.
- As technology shifts, new jobs are created, such as electric car energy grid maintenance, manufacture, use of energy efficiency and low emissions technologies.
  Energy audits, building design, landscaping, use of solar passive architecture etc, are already starting to create jobs in this area. The need to retro-fit low emissions technology to entire economies is a significant area for employment.

[43] http://www.unep.org/publications/search/pub_details_s.asp?ID=4002
[44] http://www.gbca.org.au/

- Natural resource management, reforestation and afforestation, control of vegetation, land management, agricultural practice, are all undergoing a fundamental shift and will require significant inputs from skilled workers. It is predicted that many millions of hectares of land will get converted to forestry in order to create carbon sinks. Not only the jobs related to this activity but all the ancillary jobs in nurseries, seed collection etc, will need to be developed and staffed.
- Water management, recycling, storm water reuse, cleaning up of the waterways and river systems is well on its way to being established as an important regional employer. Currently the water sector employs more than 80,000 people in urban and regional jobs. This compares to the entire coal industry employing 130,000 people of which only 30,000 are directly employed.

GREEN JOBS

The technological pace of jobs in the green sector is rapid and, with significant investments around the world, is developing very quickly to be a major source of employment. The Obama administration has made it the centrepiece of its recovery plan in combating the financial crisis. The American Reinvestment and Recovery Act (ARRA) [45]report, "Middle Class Taskforce: Green Jobs Update" released in May 2009 states:

"The key factors include a public mandate to achieve an energy conservation goal; leadership invested in meeting the goal; private sector investments in new technology and energy efficiency; and partnerships between labour, community colleges and other training programs to ensure employers have access to skilled workers. These are also the key factors to creating clean energy opportunity economy-wide.
The Recovery Act includes:
(1) $11 billion for investments in a new smart grid, investments that will create thousands of miles of new or modernized high-tech transmission lines, while training and employing highly-skilled and well-paid line workers;
(2) $6 billion in loan guarantees to enable green industries to continue their rapid growth; (3) $4.5 billion to the General Services Administration to convert federal buildings into high-performance green buildings, which generally combine energy efficiency and renewable energy production to minimize the energy use of the buildings;
(4) $5 billion to the Weatherization Assistance Program, $250 million to HUD assisted housing retrofits, and $600 million to public housing weatherization that will create tens of thousands of new jobs weatherizing and retrofitting homes;
(5) $6 billion to state and local governments for clean energy programs;
(6) over $2 billion in tax credits to cover 30 percent of the cost of home energy efficiency improvements like installation of energy efficiency windows; and
(7) $19 billion on public transportation and high speed rail.

Similar developments are seen in Europe with the EU committing to a 20:20:20 outcome. The EU has agreed to reduce combined emissions by 20% by 2020 against a 1990 benchmark, to ensure 20% of all stationary energy from renewable sources, and to create a 20% energy efficiency

[45] http://www.whitehouse.gov/blog/White-House-Enviro-Council-Accepts-Biden-Challenge-Help-Retrofit-America/

saving. This will come only as a result of significant investment in training, R&D and support for new technologies creating new green jobs.

In Australia, research such as the report[46] *Green Gold Rush: How ambitious environmental policy can make Australia a leader in the race for green jobs*, argues that Australia could become a leader in certain green industries.

The report identifies six 'green collar' industries with great potential for growth and development:

- Renewable energy
- Energy efficiency
- Sustainable water systems
- Biomaterials
- Green buildings
- Waste and recycling

Australia could generate up to 850,000 green collar jobs by 2030 and multi-billion dollar export opportunities, according to the report by the Australian Council of Trade Unions (ACTU) and Australian Conservation Foundation (ACF).

The NSW Green Skills Strategy[47] was developed so that the workforce in New South Wales will have the skills to support the transition to a carbon constrained and more sustainable economy. As businesses are beginning to experience pressures for change as a result of global warming and other environmental challenges and calamities, this strategy will assist business to become more sustainable and to take up new business opportunities created by global environmental challenges.

The Australian treasurer claimed, "The Budget also invests in Australia's transition to a low pollution economy. The Government will invest $2 billion to support industrial scale Carbon Capture and Storage projects in Australia, and a further $1.5 billion to demonstrate large scale solar generation projects. These investments will immediately drive billions of dollars of private investment in clean energy solutions, create thousands of green collar jobs, and make sure Australia is ready to compete in the carbon-constrained world of tomorrow. It is just another example of how we are driving our stimulus dollar further – to protect jobs now, and secure the country's long-term economic interests."

The CSIRO in its research paper, 'Growing the Green Collar Economy: Skills and labour challenges in reducing our greenhouse emissions and national environmental footprint[48],
states that with the right mix of incentives and subsidy, "Achieving a rapid transition to sustainability would have little or no impact on national employment, with projected increases in employment of 2.5 to 3.3 million jobs over the next two decades.
Employment in sectors with high potential environmental impacts will also grow strongly, with projected increases of more than 10% over ten years. This will add 230,000 to 340,000 new jobs – in addition to normal employment turnover – in the transport, construction, and agriculture, manufacturing and mining sectors. Employment in construction and transport sectors is projected to grow significantly faster than the national average."

[46] http://www.acfonline.org.au/articles/news.asp?news_id=2047
[47] https://www.det.nsw.edu.au/industryprograms/green_skills/greenskills.htm
[48] http://www.csiro.au/resources/GreenCollarReport.html

The key challenges outlined by the report apply to all segments of Australian industry and populations.
"But achieving the transition to a low carbon sustainable economy will require a massive mobilisation of skills and training – both to equip new workers and to enable appropriate changes in practices by the three million workers already employed in these key sectors influencing our environmental footprint."

Current approaches do not appear sufficient to meet these challenges.
There are at least five key elements for a coherent and systematic response to the skills challenges associated with this transition, and this list forms the key criteria to be addressed by Indigenous Australia in its quest to benefit from a green jobs boom:

1. A robust signal and certainty on the way forward through legislation and policy;
2. Engagement at community level ;
3. Provision of green skills and vocational training;
4. Appropriate support to establish SMEs; and
5. Long term time horizons.

GREEN BUSINESSES

The opportunity for Indigenous Australia is of course not limited to the jobs that businesses will be creating but also in creating the businesses themselves.
The following broad areas of job development will also support entrepreneurs.

- Renewable energy
- Energy efficiency
- Sustainable water systems
- Biomaterials
- Green buildings
- Waste and recycling

15% to 20% of the Australian landmass is owned under one title or another by Indigenous Australians. The opportunity to become creators of carbon permits under any CPRS type emissions trading scheme (ETS) is a generational opportunity for landowning communities that meet the necessary requirements (type of title, quality of land, Kyoto compliance etc) to participate in the carbon constrained economy.

The complexity involved in establishing Carbon Sequestration Rights (CSR) on land should not be underestimated. Specifically, it is unclear whether the various titles under which land is held by a majority of Indigenous Australians will allow for certainty in the registration process in each state and territory.

Already there are opportunities well before the start of an ETS for such plantations to be developed. Feasibility studies are being carried out and there is significant demand for projects in this area. As mentioned earlier, businesses that provide these services are much in demand. Nurseries, seed collection etc, are excellent business opportunities for those that do not have access to large land holdings.

Similarly, renewable energy projects will require land and this again enables land-owning communities to participate in such projects as become commercially viable under a Mandatory Renewable Energy Target 2020.

Businesses in the area of service provision, from training to operational delivery over the whole range of activities described, are currently being established nationally and internationally. The opportunity here is to be part of the coming boom.

The economic explosions of past industries, has largely past Indigenous Australians by.
As a nation, Australia cannot let that happen, yet again. If there was ever the will to ensure Aboriginal and Torres Strait Islander people achieve equity, the opportunity presents itself now through climate change adversity.

To enhance the Indigenous quality of life, comparable to that of other Australians, by connecting them to the real economy, is certainly within reach. No longer can they be left sitting on the periphery of society's vision; economic, social and cultural inclusion must happen, if not, the continuing many consequences for the nation as a whole, will be as disastrous as the impending issue of climate change itself.

William (Sam) Jeffries
Sam Jeffries, CEO of Indigenous Environmental Services (IES), has a thorough understanding of land management and other issues related to Indigenous participation in the broader economy. Sam is a proud Mooraworri man, born and raised in Brewarrina, the youngest of seven children. He has been involved in Aboriginal Affairs since leaving school. Sam spent 20 years in Lightning Ridge in far north western NSW establishing the Community Development Employment Program CDEP project, and purchased businesses to give the community an economic platform.
Current appointments include:
Deputy Chair of the Indigenous Land Corporation, Chairperson of the Murdi Paaki Regional Assembly, Board Member of the Western Catchment Authority, Panel Member of the NSW Aboriginal Trust Fund Repayment Scheme, and Chairperson of the National Aboriginal Sports Corporation Australia.
Sam is Adjunct Professor Jumbunna Indigenous House of Learning, University of Technology, Sydney.
Sam was awarded the Centenary Medal in 2001 for services to Aboriginal and Torres Strait Islander communities with a priority on governance, and also has held a range of senior positions including: Walgett Shire Councilor from 1999 to 2003, ATSIC Councilor from 1990 to 2005, Chairperson of the Murdi Paaki Regional Council from 1996 to 2005, Board Member of the Aboriginal Housing Office from 1998 to 2005, and Chairperson of the NSW ATSIC State Council from 2002 to 2005.

Ram Devagiri, Director and General Manager, has had many years of experience in delivering complex outcomes in the corporate world in Europe, Asia and in Australia. He has worked in senior executive positions in a range of industries. Ram was NSW general manager for a global asset management and soft services company and had 1250 staff reporting to him, delivering in excess of $60M in annual turnover. He was also National Key Accounts Director with carriage of a portfolio of well over a half a billion dollars in annual revenue. He has developed and delivered complex training to senior executives in the corporate world. He has also delivered training on personality profiling, relationship management and complex B2B sales environments. Ram has managed large hotel properties in Europe and India in various capacities including General Manager. Having worked with Steigenberger hotels in Germany, Ram has also spent nine years with Oberoi Hotels in various senior capacities. Ram has been deeply involved in the area of Indigenous engagement with climate change for over two years. He has travelled widely to meet and consult communities and to carry the information on climate change to Indigenous organisations and business groups. He has delivered workshops on climate change and more recently on the CPRS to corporate groups and Indigenous communities. Ram has been involved in the discussions on the development of the CPRS as member of the Stakeholder group on Land based sector established by the Department of Climate Change.