

ME WHAKAPUTA KĒ I RUNGA I TE TIKA

# JUST CHANGE

CRITICAL THINKING ON GLOBAL ISSUES  
He whakaaro kaikini mō ngā take o te ao

TE KOROKORO O TE PARATA

# GOING UNDER



## THE TWIN CRISES OF CLIMATE CHANGE

The biggest challenges of the climate crisis are about social justice

## MANAGING CLIMATE CHANGE, FIJIAN-STYLE

Local communities re-discover ancestral practices to 'bring back the fish'

*Just Change* is produced by Dev-Zone ([www.dev-zone.org](http://www.dev-zone.org)), a programme of the Development Resource Centre (DRC) – a not-for-profit, non-governmental organisation governed by a charitable trust. We are core funded by NZAID Nga Hoe Tuputupu-mai-tawhiti (The New Zealand Agency for International Development).

The DRC's two programmes are Dev-Zone ([www.dev-zone.org](http://www.dev-zone.org)), a resource centre on international development and global issues for the development and human rights sector, as well as tertiary students and the general public, and the Global Education Centre ([www.globaled.org.nz](http://www.globaled.org.nz)), which provides training and resources on global education to the formal and informal education sectors, and the community youth sector.

The motivation for *Just Change* falls under Dev-Zone's mandate to inform and educate to empower people to take action to create a just world. Grounded in Aotearoa New Zealand and the Pacific, but with a global reach, *Just Change* prioritises a holistic, sustainable, approach to development; a call for the development community and the general public to take action; and an overall aim of ensuring that the voices – and the issues – of those who are most vulnerable are heard.

*Just Change* is a product of, by, and for, those who are invested in sustainable development, social justice, and human rights. The magazine comes out every four months – each issue is based on a different global concern. Writers are not journalists; they are either those working in development or students/teachers of development studies and related programmes. Articles and other contributions are based on academic research and/or development work in the field.

*Just Change* is published every four months. To subscribe to *Just Change*, please email [info@dev-zone.org](mailto:info@dev-zone.org) or contact us at the address below.

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**Cover image:** Tuvalu high tides 2005 February 9. Kids on kaupapa (platform) at high water in their neighbourhood. Funafuti, Tuvalu. Photo by Gary Braasch © 2005.

**Note about the title translation into te reo Māori:** Kaiwhakahaere Piripi Walker chose the ancestral phrase, 'Te Korokoro o Te Parata', for the title of this issue, 'Going Under', which means 'slide into disaster'. This is a reference to the mouth of the great whirlpool into which Te Arawa waka was drawn (but escaped!).

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## HE WHAKAARO NĀ TE ĒTITA TĀPAE WHAKAARO GUEST EDITORIAL

# What to Pay for - Climate Change or Development?

JYOTISHMA RAJAN NAICKER, WWF

*During my childhood ... we never experienced severe sea flooding. There were storms, but they weren't that bad. As the sea levels continue to rise in Kiribati, several king tides hit the island. Saltwater intrusion affects the quality of water in wells, foods taro patches, gardens, and puts stress on plants/trees which are very important to the life and culture of an I-Kiribati.*

**Ben Namakin  
Programme Manager**

Environment Education & Awareness  
Conservation Society of Pohnpei

Climate change is real, and small island states like those in the Pacific, are among the most vulnerable to this threat. This year, Northern Fiji incurred over FJ\$10m (NZ\$8.7m) of damages from severe flooding. King tides in Tuvalu flooded many homes, contaminating food supplies. The Cook Islands economy and infrastructure incurred millions of dollars of damage from five cyclones in *one single month* during the 2004-05 cyclone season. Massive coral bleaching during the 1998 El Niño killed one third of Palau's reefs, the damage estimated at FJ\$146.6m (NZ\$127.8m), and an associated decline of annual tourism earnings by 9%!

The point here is that climate change is very costly, and this cost is disproportionately borne by countries *not* causing the problem. The costs to small Pacific economies are not only unaffordable; they are also a setback to achieving sustainable development. For example, money spent on disaster recovery would be much better invested in sustainable development.

To keep climate change from reaching dangerous levels, global emissions of climate changing gases *must* fall by 60%-80% of 1990 levels by 2050. It's not as far away as you'd think! The window of opportunity is closing fast. Failure to take action to address climate change will further hinder meaningful, sustainable development which is enshrined as a human right in the 1986 United Nations Declaration on the Right to Development.

Indonesia will host the 13th United Nations climate change conference (COP 13) in December this year. This conference is the *last* chance the world has to start negotiating a globally-binding agreement that limits climate change to well below dangerous levels.

Pacific Island governments must attend COP 13. They are accountable to their people; it is their duty to raise their constituents' concerns, and to protect their human right to sustainable development, at the Bali-based conference. They must voice the urgent need for developed countries to *significantly* reduce their emissions of climate changing gases by increasing their use of renewable energy and energy efficient technologies.

In return, it is the duty of industrialised countries to *listen* to the concerns of highly vulnerable small island states, and take appropriate action. Industrialised countries must reduce their use of fossil fuels and increase their use of clean energy. Equally important, they must set aside sufficient funds for vulnerable countries, like those in the Pacific to build the resilience of their people and the natural resources people depend upon against the impacts of climate change. They must resist the temptation to play to economic interests and watered-down decisions made in Bali this December. Developed nations must support a strong global agreement that addresses the needs of those countries most vulnerable to climate change.

The world has shown immense commitment and solidarity in the past in addressing critical global problems, like the commitment to eradicate diseases like polio. The same commitment and solidarity is needed NOW to address climate change.

*Jyotishma Rajan Naicker is the Climate Change Campaigner for WWF's South Pacific Programme in Fiji. For more information about climate change in the South Pacific and WWF's Pacific programmes, check out [www.wwfpacific.org.f](http://www.wwfpacific.org.f).*



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# JUST CHANGE

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**'The tides are getting higher and higher': A Pacific voice on climate change**

Reverend Tafue Lusama of Te Ekalesia Kelisiano Tuvalu warns, 'While developed nations quibble over the details of the Kyoto Protocol, Tuvalu islanders are literally losing their homeland. Climate change is not a future concern. It is an immediate threat.'

# Climate Change

SUSANNAH BAILEY, GREENPEACE

## Is climate change real?

Climate change is real and the evidence is clear.

The 2,500 top climate scientists who comprise the leading authority on climate change (the independent UN body, the Intergovernmental Panel on Climate Change, or IPCC) have concluded unequivocally that climate change is real, with more than 90% certainty that it's caused by human activity.

Today, our world is hotter than it has been in 2,000 years. This may not necessarily be the warmest time in the earth's history, but the first time that the warmth is global and cannot be explained by the natural mechanisms that led to previous warm periods.

Eleven of the last 12 years rank among the 12 hottest on record. Annual global temperatures are on the rise. Global sea level rise has accelerated. Mountain glaciers and snow cover have declined on average in both the northern and southern hemispheres. More intense and longer droughts have been observed over wider areas since the 1970s. The 1990s was most likely the warmest decade in history.

The question is no longer if climate change is happening, but how we can work to mitigate the effects of climate change, and adapt to what is already happening in our environment.

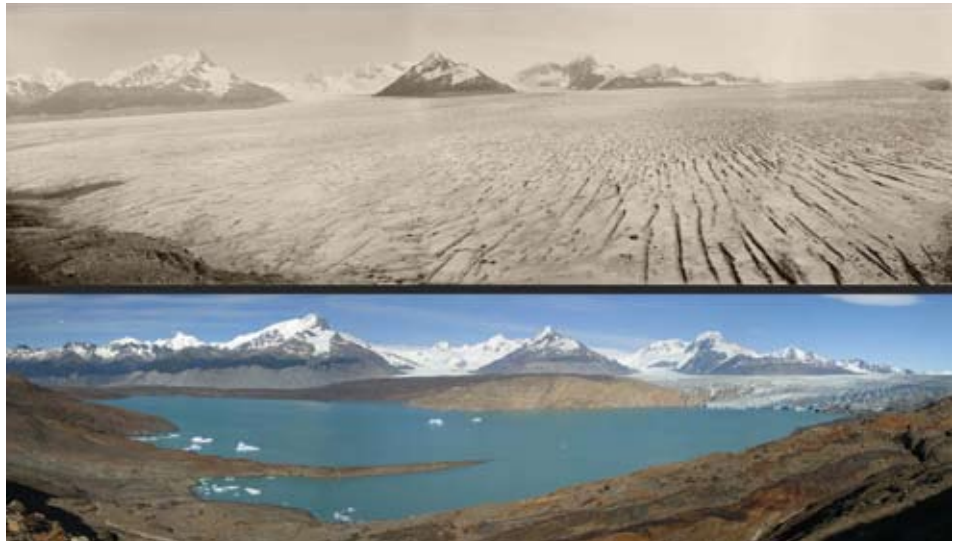
## What causes global warming and climate change?

The earth's atmosphere is made up of a delicately balanced blanket of gases which trap enough heat to sustain life. But by burning fossil fuels (like coal, oil and gas) and pumping billions of tonnes of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases into the atmosphere, humans are upsetting this balance.

These gases are trapping more and more heat, warming the globe and throwing our climate into chaos. While many greenhouse gases occur naturally, the rate that humans are adding



Houses by a collapsed river bank lie in shambles after strong winds and rain from Typhoon Reming battered Legazpi in Albay, Philippines, 340 kilometres southeast of Manila. The latest extreme weather disturbance to hit the country is a portent of more violent weather events that countries around the world are likely to experience in the future as a consequence of climate change. Photo: Ivan Sarenas/Greenpeace.



Top photo: Upsala Glacier, Patagonia, Argentina, 1928. Photo: Archivo Museo Salesiano. Bottom photo: Upsala Glacier, Patagonia, Argentina, 2004. Photo: Greenpeace.

them to the atmosphere is far from natural. It's estimated that concentrations of CO<sub>2</sub> are 30% higher than before the industrial revolution, when the wide scale burning of fossil fuels started. Carbon dioxide concentrations in the atmosphere are now the highest in 420,000 years (and probably more like 20 million). Other greenhouse gases such as methane are also playing a role, as is deforestation.

The fourth report of the IPCC confirmed that human activity is behind global warming. The panel conclude with 90% certainty that emissions of heat-trapping gases from human activities have caused 'most of the observed increase in globally averaged temperatures since the mid-20th century'.

## What are the likely effects of climate change?

Experts predict the following effects if we allow current trends to continue:

- Sea level rise due to melting glaciers and the thermal expansion of the oceans, which could wipe out whole inhabited islands
- A high risk of more extreme weather events, such as heat waves, droughts and floods
- Severe damage to natural systems such as glaciers, mangroves, forests, wetlands and coral reefs
- Increased risk of species extinction and biodiversity loss
- Spread of new diseases.

The greatest impacts will be on the poorer countries in Africa, Asia and the Pacific that are least able to protect themselves from the effects of climate change.



Composite image showing that the glacier Blomstrandbreen has retreated nearly 2km since 1928, with an accelerated rate of 35m lost per year since 1960 and even higher in the past decade. Greenpeace declares that the retreat is caused by climate change. Top photo: Man on a small boat in front of Blomstrandbreen glacier in Kongsfjorden, Svalbard, Norway, 1918. Photo: Norsk Polarinstitutt, Norwegian Polar Institute/Greenpeace. Bottom image: View of the retreating Blomstrandbreen glacier in Kongsfjorden. Greenpeace activist Rob Taylor driving the boat. Svalbard, Norway, 2002. Photo: Greenpeace/Åslund

## What about Aotearoa New Zealand?

The IPCC warns of extreme weather events such as hurricanes, floods, and droughts – the likes of which are already becoming increasingly common in Aotearoa New Zealand. Experts believe that sea level rise and storm surges brought on by global warming will also cause coastal erosion and affect coastal properties in Aotearoa NZ. Conditions will become dryer in the east and wetter in the west, impacting on industry in these regions. Agriculture and forestry production is projected to decline over parts of eastern Aotearoa NZ due to increased drought and fire. New agricultural pests and diseases will likely flourish in a warmer climate. The survival of our native flora and fauna will be at risk. The list goes on.



These changes will have significant economic impacts for Aotearoa NZ. Our agriculture and tourist sectors are particularly vulnerable to changes in the climate and landscape of Aotearoa NZ. The drought of the late 1990s cost our economy \$1bn, highlighting just how vulnerable we are to changes in the climate. More recent events have lost farmers millions of dollars.

Not only are we at risk from physical changes to the climate within Aotearoa NZ, we are also extremely vulnerable to the impacts felt and decisions made elsewhere. We may lose trading partners due to food mile concerns, damage to our clean green brand, or damage to other countries' economies. We may lose tourists and business travellers due to concerns about and/or restrictions on air travel. We may also receive an influx of environmental refugees to our shores. There are already more environmental refugees worldwide than political or war refugees.

### What levels of climate change are dangerous?

Humans have already warmed the planet by 0.6°C, which has resulted in a range of serious climate effects including extreme weather events. An increase of only 1°C in the average world temperature could cause entire forests to disappear. Experts agree that if we allow temperatures to rise more than 2°C from pre-industrial times we will cross a dangerous tipping point, with dramatic and unmanageable consequences.

### What can we do to prevent dangerous levels of climate change?

The most important action we can take to slow global warming is to reduce emissions of heat-trapping greenhouse gases. Governments, individuals, and businesses can all help.

Solutions to global warming already exist – renewable energy such as wind, hydro and solar; energy efficiency; forest protection and restoration; and new environmentally sound technologies. Government policies need to discourage unnecessary emissions and encourage climate-friendly personal and business choices.



## Major organisations concerned with climate change issues

### NIWA (National Institute of Water and Atmospheric Research)

NIWA is a New Zealand organisation which conducts research on the physical and chemical processes affecting the atmosphere and climate.

[www.niwa.co.nz](http://www.niwa.co.nz)

### The Intergovernmental Panel on Climate Change (IPCC)

The IPCC was established by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) in 1988 to assess the most up-to-date scientific, technical and socio-economic research on climate change, including its potential impacts and options for adaptation and mitigation. [www.ipcc.ch](http://www.ipcc.ch)

### Ministry for the Environment – Manatū Mō Te Taiao

The New Zealand Ministry for the Environment is charged with developing New Zealand's policies on climate change. [www.mfe.govt.nz](http://www.mfe.govt.nz)

### Climate Defence Network (CDN)

CDN is a coalition of groups working in New Zealand on climate change issues. CDN was formed to promote and support positive policies and actions that will help reduce and mitigate the serious threats that will result from human induced climate change.

[www.climatedefence.org.nz](http://www.climatedefence.org.nz)

### Greenpeace

Greenpeace is an independent, not-for-profit organisation that uses non-violent direct action, research, lobbying and diplomacy to draw attention to and encourage action on the most crucial worldwide threats to our planet's biodiversity and environment. The main focus of Greenpeace's current work programme is climate change – the biggest environmental threat we face.

[www.greenpeace.org](http://www.greenpeace.org)

There are a growing range of organisations, student groups, local transport groups and church groups working on climate issues. Keep an eye out for groups working in your community, and check the community page in this issue of *Just Change* (p31).

## Major Reports and publications

### Climate Change 2007: The Fourth Assessment Report (IPCC)

More than 1,250 authors and 2,500 scientific expert reviewers from over 130 countries contributed to the IPCC's most recent report. It is the most comprehensive and up-to-date evaluation of global warming and climate change. [www.ipcc.ch](http://www.ipcc.ch)

### Stern Review on the Economics of Climate Change

This 700-page report, released in 2006, was written by economist Nicholas Stern for the British Government. It is the most widely known report on the impact of climate change on the world economy.

[www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm)

### Hot Topic: Global Warming and the Future of New Zealand, Gareth Renowden

Using the latest evidence from the IPCC's Fourth Assessment Report, Gareth Renowden puts climate change into the Aotearoa NZ context. He examines the science of climate change in Aotearoa NZ and our options for adaptation and mitigation.

[www.hot-topic.co.nz](http://www.hot-topic.co.nz)

### New Zealand Energy Revolution: How to prevent climate chaos, Greenpeace New Zealand

This is the first major report outlining how Aotearoa NZ can reduce greenhouse gas emissions in the energy sector to avoid catastrophic climate change.

[www.greenpeace.org/new-zealand/press/reports/nz-energy-revolution-report](http://www.greenpeace.org/new-zealand/press/reports/nz-energy-revolution-report)

## International Conventions, Protocols and Agreements

### UNFCCC

The formation of the United Nations' Framework Convention on Climate Change (UNFCCC) was the first major step to coordinate international action on climate change. All of the world's major greenhouse gas emitters are part of this initiative.

### Kyoto Protocol

In 1997 more than 50 industrialised nations negotiated the Kyoto Protocol – an international agreement to address global warming and prevent further climate change. The Kyoto Protocol is part of the UNFCCC. It sets legally binding targets and timetables for cutting the greenhouse gas emissions of signatory industrialised countries. 169 countries and other governmental entities have ratified the agreement. New Zealand ratified the Kyoto Protocol in 2002.

The Protocol aims to reduce the total greenhouse gas emissions of developed countries (and countries with economies in transition) to 5% below the level they were in 1990 by the first commitment period of 2008-12. The Kyoto Protocol is the world's only international agreement with binding targets to reduce greenhouse gas emissions. As such, it is the primary tool through which governments can address climate change.

In addition to legally binding national emissions targets, the Kyoto Protocol includes various trading mechanisms. Now that the Protocol is law, formal preparations will begin to create a 'global' carbon market for emissions trading by 2008.

### Susannah Bailey is the Climate Campaigner for Greenpeace Aotearoa New Zealand.

A child runs on the beach on Iolasa island, beside the trunks of fallen coconut palm trees, their roots exposed by the sea erosion of the land on the Carteret Atoll, Papua New Guinea. Rising sea levels have eroded much of the coastlines of the low lying Carteret islands (situated 80km from Bougainville island in the South Pacific), and waves have crashed over the islands flooding and destroying what little crop gardens the islanders have.

Food is in short supply, banana and swamp taro crops are failing due to the salt contamination of the land, and the islanders live on a meagre one meal per day diet of fish and coconut. There is talk by the Autonomous Region of Bougainville government to relocate the Carteret Islanders to Bougainville, but this plan has been stalled due to a lack of finances, resources, land and coordination. Photo: Jeremy Sutton-Hibbert/Greenpeace.

# THE TWIN CRISES OF CLIMATE CHANGE

FLINT DUXFIELD, AID/WATCH

**Climate change is happening. Public pressure, armed with a wealth of scientific support has finally forced world leaders to accept what the science has been pointing to for some decades.**

Our addiction to fossil fuels has pushed us beyond mere 'dangerous anthropogenic interference' with the climate and we are now on the brink of a climatic catastrophe.<sup>1</sup> For the most part, the public debate has now moved on from whether humans are causing dangerous climate change, to how it can be stopped.

But as the wave of climate realisation has finally washed into the public domain, the bigger picture has somehow been swept aside. As terrible as the impacts of climate change will be, the biggest challenges that the climate crisis poses are not environmental. Nor, as our leaders frequently suggest, will they be technological or based in economics. They are fundamentally about social justice.

Social justice must be at the heart of climate change discussions because both the impacts of global warming and the sacrifices necessary to prevent a climatic catastrophe will impact countries and communities in fundamentally unequal ways. Unless this is directly addressed in the global response to climate change, we are almost certain to further exacerbate global poverty and insecurity. Crucially, the worst impacts of global warming will increasingly fall with disproportionate force on those who have contributed least to global emissions – the people of the global south. Moreover, as necessary as combating the climate crisis is, much of the global south are simply not in the position to meaningfully engage with the climate crisis because they are preoccupied by a crisis of equal, if not greater urgency – that of extreme poverty. Unless the twin crises of poverty and climate change can be overcome simultaneously, we are almost certain to fail at both.

## The need for climate justice

As the UN Environment Programme has convincingly demonstrated it is 'the poor, in Africa and developing small island states and elsewhere, who will suffer the most, even

though they are the least responsible for global warming.'<sup>2</sup> In the Pacific, the number of people affected by weather-related disasters increased by 65 times between the 1970s and 1990s, most of whom were from low income countries.<sup>3</sup> When combined with greater incidence of disease, heat-related mortality and greater scarcity of food, land and natural resources, the impacts of unchecked climate change on the global poor will be staggering.

However, as the findings of Stern Review demonstrate, North America and Europe alone have produced around 70% of global emissions since 1850.<sup>4</sup> On a per capita basis, the OECD member countries currently emit more than ten times the emissions of the global south and clearly have a disproportionate

**OECD member countries currently emit more than ten times the emissions of the global south.**

responsibility in bringing about the climate crisis.

In recognition of the underlying need for a justice-driven response to the climate crisis, several proposals have been tabled designed around the principle of climate justice. Perhaps the most prominent of these is the 'Contraction and Convergence' (C&C) model originally developed by the UK's Global Commons Institute. The essence of C&C is that all individuals deserve the right to a fair share of the world's carbon resources within the earth's ecological limits. To take into account historical inequities in carbon usage, the model holds that industrialised countries should drastically contract their carbon output to an emissions level *less* than what their respective per capita share would be, to allow the space for majority world countries to continue emitting at a greater rate until their basic development needs are met. At this point C&C holds that per capita emissions from the majority world would converge downwards in line with those of the minority world, to a sustainable global level.

One of the main problems with C&C, and indeed, other 'cap and share' type approaches is that while they present some solutions to



the problem of equitably distributing limited resources, they are silent on the *impacts* side of the climate-justice challenge. As vital as measures to prevent runaway climate change are, global emissions to date have already committed the planet to at least a 1.4°C temperature rise over the next 20 years.<sup>5</sup> Adaptation must not be seen as a substitute for rapid mitigative action. However, as the people of the Carteret Islands, Bangladesh and other low lying states are already discovering, the need to adapt to the challenges presented by climate change is equally as pressing as the need to develop an equitable means of preventing runaway climate change.

In the C&C model, this has entailed the addition of a third 'C' – that of 'compensation' – to be provided by the industrialised north in recognition of its responsibility in engendering the climate crisis through its overexploitation of the global commons. Perhaps the most cogent attempt to deal with this dilemma, however, has emerged in the Greenhouse Development Rights (GDRs) framework put forward by EcoEquity and the Stockholm Environment Institute. Rather than being based in notions of emissions equality, GDRs focuses on combating the climate crisis whilst preserving the right to a sustainable level of human development for all people.<sup>6</sup> The implication of the GDRs approach is that the





APEC demonstration (Sydney 2007) highlighting the need for rapid action on climate change. Public concern over climate change is growing, but world leaders so far seem reluctant to take the steps necessary to prevent runaway global warming. Photo: Flint Duxfield.

global north, who is most responsible for global warming, must foot the 'adaptation' bill for those countries in the global south who will be worst affected. Moreover, they must do this whilst upholding their existing aid commitments to poverty alleviation under the Millennium Development Goals (MDGs).

### The importance of 'additionality'

Whether climate adaptation funding is classified as 'aid' might seem a fairly trivial point, however, there are at least two very good reasons for maintaining a clear distinction between the two. In the first place, from a social justice perspective it is argued that adaptation funding should be provided as *compensatory financing* to countries that will be worst impacted in recognition of the global north's culpability in causing the climate crisis.

Equally as important, if adaptation funding simply removes much needed funds from other areas of development, the end result will not be any greater improvement in the lives of the people from the global south. Aid donors have a long history of inflating their official development assistance (ODA) figures by including non-poverty related expenses that promote their own commercial or foreign policy agendas. The global north must not be permitted to perform similar deceptions by conflating existing development

funding commitments with their concurrent climate adaptation obligations.

In so saying, the implication is not that aid for poverty alleviation can or should be delivered in isolation from funds destined for climate adaptation or mitigation – quite the opposite in fact. Poverty-focused development activities must be conducted with comprehensive consideration of the likely impacts of climate change if they are to be most effective. In the same way, funding for adaptation must be delivered through mechanisms which prioritise poverty alleviation and ownership by affected communities in response to their own adaptation needs. The point is that the minority world's responsibility in funding adaptation must not undermine equally necessary commitment to promote human development and poverty alleviation. As the Stern Review concludes, it is 'still more important for developed countries to honour both their existing commitments to increase aid sharply *and* help the world's poorest countries adapt to climate change' [emphasis added].<sup>7</sup>

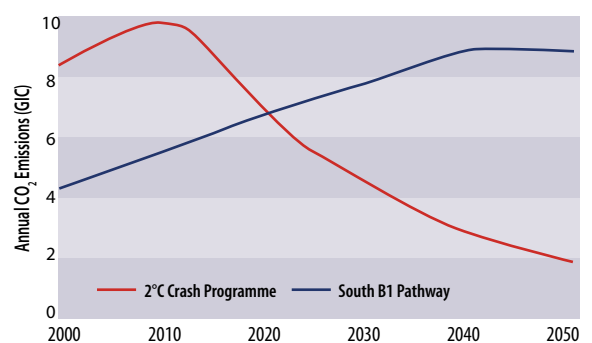
To date, however, the argument that rich countries are obliged to pay compensatory finance to fund the south's adaptation doesn't seem

to be getting through to world leaders who continue to see global warming predominantly as an environmental problem. To the extent that they have been willing to address the adaptation needs of the global south it has been almost entirely viewed as an extension to existing development activities. They have chosen to use the wealth garnered through overexploitation of the global commons to shore up their own defences against climate change with hardly a thought for those who will be worst hit in the majority world.

The Australian government, for instance, has invested AU\$1.8bn in preparing for extreme storms and water scarcity, compared with a mere AU\$32.5m promised in adaptation aid. The only country which has thus far agreed to provide adaptation finances external to their aid commitments is The Netherlands, who have already surpassed their MDG target by providing 0.8% of their GNI as aid. Even then, the US\$18m so far pledged by The Netherlands to international adaptation funds pales in comparison with the US\$2.9bn to be spent on reinforcing dyke systems domestically. As vital as adaptation is in the global north, this disparity reveals a concerning isolationist approach to climate change, as if it will somehow stop at national borders.

### The practical imperative for climate justice

In their efforts to downplay their responsibility in combating the climate crisis, leaders of high-emitting developed countries reiterate a common theme: 'it won't help if we reduce our own emissions unless large developing countries also reduce their emissions'. While this is frequently and inexcusably used as a justification for inaction, it also reveals an inescapable truth. With emissions from the majority world set to overtake those of the minority world in the next five to ten years, any concerted effort to reduce global emissions must also include emissions reduction in the global south. As the graph below demonstrates, even following the most optimistic 'B1' scenario, the south's rising emissions will on their own be sufficient to breach the global two degree 'crash' trajectory.



The global south's B1 pathway and the global two degree 'peak and decline' trajectory. Source: EcoEquity.



## A double edged crisis

At present, much of the majority world is consumed by an arguably more pressing concern than climate change – that of global poverty. With more than half the Millennium Development Goals unlikely to be met by 2015, it's clear that there are insufficient resources to address basic global development needs, let alone the additional burden of tackling the climate crisis. Moreover, the recent efforts of northern donors to provide climate change assistance without a concurrent commitment that these funds will be additional to existing aid flows is only likely to further divert much needed funding away from the poverty crisis. As became apparent at the New Delhi Council of Parties in 2002, this is the source of a major impasse in global climate negotiations with the countries of the global south refusing to make emissions reduction commitments unless there is a commitment to financial support from the global north.

Nobody should be forced to decide between a life of abject poverty in a climatically stable world and one of relative development on a burning planet. The latter is a non-option in any case, as the gains of development will be totally undermined unless accompanied by climate mitigation and adaptation. There is, in short, an obvious tension between the development needs of the global south and the need of the global community as a whole to tackle the climate crisis. This is particularly so when considering that as well as being the major cause of global warming, energy provision has also been conclusively shown to play a significant role in reducing poverty, particularly for women.<sup>8</sup> Any comprehensive and feasible programme for addressing the climate crisis must take into account the future energy needs of the majority world as well as the global need to reduce emissions.

As the authors of the GDRs framework observe, the current impasse in the global climate change negotiations can only be overcome if the southern countries are guaranteed their right to develop *at the same time* as they are assisted in reducing their emissions.<sup>9</sup>

Herein lies the most compelling reason that compensatory climate funding should be provided by the global north *in addition* to committed ODA funds: unless the countries of the global south are well on the path out of impoverishment they will have limited incentive and, more importantly, *limited capacity* to focus on global climate mitigation.

When seen in this light, there is a strong argument that the global north should in fact *increase* its development assistance to allow a more rapid transition towards a global com-

**Unless the twin crises of poverty and climate change can be overcome simultaneously, we are almost certain to fail at both.**



Protests surrounding the recent APEC summit in Sydney highlight public concern with the lack of meaningful action on climate change. Photo: Flint Duxfield.

munity best positioned to engage the climate crisis. As the IPCC has demonstrated, reducing the number of people living in poverty will dramatically reduce the number of people at risk through climate change. Moreover, it will increase the number of countries that are in a position to meaningfully focus on climate mitigation. Eliminating poverty, is in other words, a precondition to preventing runaway climate change, as much as rapid mitigative action is necessary to prevent further poverty and suffering.

The climate crisis presents a challenge to the mainstream growth-led development model. The majority world cannot and should not be forced to develop in the same profit-driven, growth-obsessed model the global north has done with such destructive consequences for the planet. We must maintain the right of the global south to escape the binds of poverty whilst acknowledging the need to adopt climate-neutral methods of doing this which do not put an

unquestioned faith in unchecked growth and resource destruction as the driver of development.

## Sharing the climate burden

As it was initially envisaged, the Kyoto process provided a genuine opportunity to equitably address global development needs in parallel with global climate needs. Through the UN's Framework Convention on Climate Change (UNFCCC), 190 countries committed to protecting the climate 'on the basis of equity and according to their common but differentiated responsibilities and respective capacities'.<sup>10</sup> Moreover, the UNFCCC expressly states that 'the developed country Parties should take the lead in combating climate change and the adverse effects thereof'.<sup>11</sup>

While the principles of 'equity' and 'differentiated responsibilities and respective capacities' have a nice ring about them, in the wheeling and dealing of international negotiations, the Kyoto process has resulted in extremely weak mechanisms for dealing with the development dimension of the climate justice dilemma. Alongside the much criti-



cised Clean Development Mechanism, three new global adaptation funding schemes have been formed (The Special Climate Change Fund, Least Developed Countries Fund and the Adaptation Fund) without any binding commitments from the developed countries to actually provide any substantial resources to make these funds effective. To date, Canada, Europe and Aotearoa New Zealand have committed a mere US\$182m to these funds while Australia, Japan and the United States have provided no funds at all.<sup>12</sup>

With the failure of the Kyoto process to adequately ensure commitments from the global north, negotiations over the second commitment period of the Kyoto protocol in December 2007 provide a vital opportunity to consider desperately needed alternatives to the current climate burden sharing arrangements.

### A post-2012 framework

Building on the principles of responsibility and capacity enshrined in the UNFCCC, Oxfam International has offered one such alternative framework, dubbed the Adaptation Financing Index (AFI). The AFI apportions

national responsibility based on cumulative per capita emissions, and capacity based on the UN's Human Development Index. Only those countries that have attained a certain level of development are obliged to contribute funds for adaptation, which they do in proportion to their cumulative emissions since the signing of the UNFCCC in 1992, population size, and level of human development.<sup>13</sup>

EcoEquity's GDRs approach also provides a Responsibility and Capacity Index which makes efforts to include *intra*-national differences in responsibility and capacity as well as those between wealthy and poor countries. By taking into consideration the capacity and responsibility of wealthy groups within the global south (the 'Germany inside India') it is argued that a more accurate index is possible which can be applied equally to adaptation costs as well as necessary global mitigation costs.

Here is not the place to debate the merits of the various indices, suffice to say that for

the reasons outlined above, they must be premised in equity and generate sufficient resources to adequately combat climate change whilst upholding the right of the global south to develop out of poverty. In any case, any index based on these principles will reveal that for most countries of the global south their

primary responsibility must remain poverty alleviation and human development. For the wealthy north, the appropriate focus is three-fold.

### How can you put a cost on the destruction of an entire ecosystem?

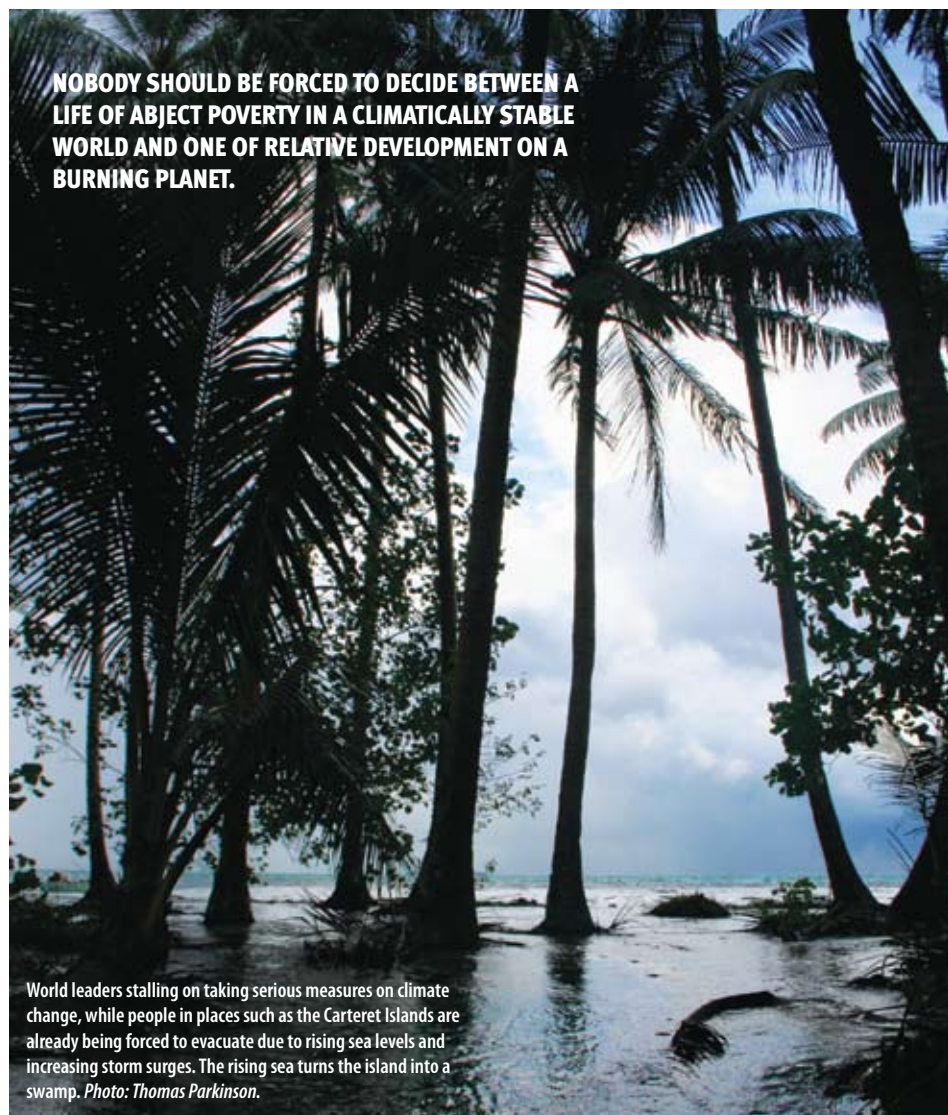
In the first place, they must rapidly reduce their domestic emissions to a level that allows the environmental space for the global south to develop without surpassing the two degree 'crash' trajectory.

Secondly, they must fulfil their obligations under the UNFCCC by developing a post-2012 burden-sharing agreement with solid commitments to fund the adaptation and mitigation expenses that the global south cannot afford and are not responsible for. The Bali Meeting of Parties this December provides a perfect opportunity to realise this necessary step.

Thirdly, they must live up to their commitments to meet the MDGs by 2015 by continuing to provide development assistance additional to other appropriate climate funds. Moreover, they must ensure that this funding promotes *climate-friendly* development processes, particularly around the provision of renewable energy.

Given the prevalence of climate-intensive development over the past half century, the final point is worthy of special mention. Both multilateral and bilateral development institutions have a history of promoting fossil fuel intensive industries through development funding. In 2006, for instance, the World Bank provided a mere US\$153m in funding for renewable energy projects, while over US\$1bn was spent on extractive (fossil fuel) industries.<sup>14</sup> Similarly, from 2000 to 2006, fossil fuel projects comprised over 25% of the Asian Development Bank's energy portfolio (US\$1.54bn) while only 4% (US\$242m) went to renewable energy projects.<sup>15</sup> While some bilateral donors have made admirable efforts to incorporate climate-friendly development solutions, others have equally disappointing records in this regard.

Research by AID/WATCH reveals that between 1997 and 2005 Australia spent around US\$56m on fossil fuel energy projects through the aid programme with only AU\$10m being spent on renewable energy projects.<sup>16</sup> The affect of these climate-intensive energy projects has been to lock developing countries into fossil fuel dependence which will only make the costs of combating the climate crisis even more expensive in the long term.



**NOBODY SHOULD BE FORCED TO DECIDE BETWEEN A LIFE OF ABJECT POVERTY IN A CLIMATICALLY STABLE WORLD AND ONE OF RELATIVE DEVELOPMENT ON A BURNING PLANET.**

World leaders stalling on taking serious measures on climate change, while people in places such as the Carteret Islands are already being forced to evacuate due to rising sea levels and increasing storm surges. The rising sea turns the island into a swamp. Photo: Thomas Parkinson.





Climate change protest. Photo: Friends of the Earth Europe.

### What will it cost to save the planet?

Discussing the 'costs' of climate change is a messy, unsatisfying, but unfortunately unavoidable way of approaching the climate problem. How can you put a cost on the destruction of an entire ecosystem? How can you possibly put a price on the impact of relocating an entire island of people from communities they have lived in for thousands of years? As George Monbiot has convincingly argued, for all the hype surrounding the Stern Review, taking action should be a moral decision, not an economic one. That said, wealthy nations have so far been unwilling to embrace the moral arguments for acting on climate change. Short of ignoring the issue completely, it is essential to try to get a grip on the financial resources necessary to reduce the negative impacts of global warming, especially on those people with limited capacity to respond to the climate crisis.

The World Bank has estimated that the cost of 'climate-proofing' the majority world's future development alone will be between US\$10-40bn per year. Various commentators have pointed out problems with these estimates, namely that they do not include funding to protect existing (i.e. non-future investments) assets, or the cost at the community level (as opposed to government or foreign investment and aid). Oxfam International suggests that if we incorporate these costs, at least US\$50bn per year will be required in adaptation funding in the global south, provided global warming can be kept

below the two degree threshold.<sup>17</sup> UNDP's head Kermal Dervis has suggested as much as US\$100bn will be required per year from the global north, a figure which ChristianAid also supports.<sup>18</sup> The GDRs framework, which includes adaptation costs from both the south and north, suggests it is not unrealistic to foresee cumulative global adaptation costs exceeding 1% of Gross World Product (around US\$600bn).<sup>19</sup>

If this seems like an unattainable sum of money, consider that global military expenditure in 2007 will be around US\$1.2trillion (of which nearly half is that of the US). Interestingly enough, several commentators, including Tim Flannery and UK secretary of State David Milliband, have suggested that what is needed to combat the climate crisis is a degree of societal mobilisation akin to a 'war footing.' Given the number of studies that have overwhelmingly demonstrated that climate change presents a far greater threat to global security than the use of terror by extremist groups, perhaps global leaders could extend their current penchant for declaring war on abstract nouns, by shifting focus from 'terrorism' to 'climate change'. It could, incidentally, have a similar Keynesian effect to global military spending, only with arguably more positive results.

Even excluding military funding, there are a number of feasible ways the global north could raise the resources necessary to adequately and equitably deal with climate change. Income taxes, carbon taxes, carbon

credits or airline taxes all have their various merits and all have the potential to raise in excess of what is required. It is not the means, but the will, which is required to tackle the climate crisis in a socially just manner.

The Stern Review has conclusively demonstrated the economic argument for acting early to prevent the climate crisis. The environmental arguments have also been proven beyond doubt. It is now the social justice argument which must be won, not merely because a world of great poverty, suffering and conflict is not the one we want our children to inhabit, but because unless we do so, there will not be a world for our children. Period.

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# Natural hazard mitigation

## The role of insurance and international disaster aid

EMILIO RODRÍGUEZ

**T**he population in hazard prone areas has increased over the past half century as a result of world population growth. At the same time, due to climate change, natural disasters have become – and are expected to be – more frequent. While loss of life from natural hazards has decreased, economic losses have increased.

The resulting impact of these factors on the affected countries will depend on the state of those countries' economies; the current imbalances between developed and developing countries are likely to increase, as developing countries are not only more affected by natural hazards, their financial losses are also usually higher.

### Insurance

In most countries, insurance is seen as a means to pay for potential losses. Usually, insurance is sold by private companies, so the risk of large losses can be transferred and spread internationally through reinsurance companies. One benefit of insurance schemes is that after the occurrence of a disaster, the people affected can quickly receive money to cope with their losses. On the other hand, those seeking insurance face almost

unaffordable premiums; this in turn makes insurance schemes inequitable.

Although insurance is already popular, the increasing value of losses means that insurance has become more and more difficult to obtain. Insurance companies have begun to limit themselves, and some governments are even withdrawing from insuring certain hazards. According to Swiss Reinsurance, in 1998 developed countries accounted for 90% of the worldwide premiums. To render insurance more equitable and affordable, a possible solution could be a public and private insurance scheme with a clear objective of discouraging development in hazard prone areas and thus rewarding mitigation efforts.

**Some governments are withdrawing from insuring certain hazards.**

### International Disaster Aid

Nowadays, there is very little international disaster aid from developed countries to developing countries, especially compared to the burden that economic losses related to natural hazards impose on developing countries.

The official aid is mainly given by the members of the Organization of Economic Development (OECD) through its Development Aid Committee, though most of these donations are given to cover losses from mili-

tary conflicts. Another source of funds is the World Bank, which grants subsidised loans to developing countries. However, it also borrows money for post-disaster reconstruction, which has to be paid back by the taxpayers of developing countries receiving the loans. Since the 1980s, around 56 countries have borrowed US\$7.5bn from the World Bank, but since funds borrowed must be repaid, it should not really count as disaster aid.

A problem with international aid is that developing countries can over-rely on these donations, perhaps seeing international donors as insurers of the impacts of natural hazards, and may therefore fall short in their mitigation measures. Overall there is very little international aid, and since developed countries are responsible for most of global greenhouse gas emissions, and arguably liable for current climate change, developing countries can claim compensation for the burdens imposed on them as a result of global warming.

Given the large burden imposed on developing countries by natural disasters, and the clear implication of the developed countries in creating this burden, there may be a chance for the latter to share the disaster losses through a global loss sharing scheme linked to mitigation measures.

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#### BOOKS FROM THE DEV-ZONE LIBRARY

HE PUKAPUKA MAI I TE KOHINGA A DEV-ZONE



**Heat: how to stop the planet from burning, George Monbiot.** London: Penguin Books Ltd, 2007.

It now seems certain that a 90% cut in emissions within 25 years is needed to stop the world from becoming largely uninhabitable. This book analyses the possibilities and pitfalls of energy efficiency, nuclear power, renewable resources and new technologies, and measures the cuts that can be made to solve the problem of climate change.

**Environmental principles and policies: an interdisciplinary approach, Sharon Beder.** Australia: UNSW Press, 2006.

Analysing economic-based and market-oriented environmental

policies, this book examines the principles of international treaties and the national laws of many countries to evaluate policies including pollution charges, emissions trading, water markets, biodiversity banks and tradeable fishing rights.

**The Rough Guide to climate change, James Henson.** London: Rough Guides Ltd, 2006.

Rough Guides regard travel as a global benefit, but believe travellers have a responsibility to limit their personal impact. This book provides information about climate change with a balanced and comprehensive guide to global warming that covers the science, the symptoms and the solutions.

**The atlas of climate change: mapping the world's greatest challenge, Kirstin Dow and Thomas Downing.** Berkeley, CA: University of California Press, 2006.

This book looks at the climate change implications for food and water supplies, human health, sensitive ecologies, vulnerable cities, and cultural treasures – especially in countries lacking the resources to adapt. It also reviews climate-change politics

and current response efforts, such as Kyoto commitments and emissions trading.

**A climate of injustice: global inequality, North-South politics, and climate policy, J Timmons Roberts and Bradley C Parks.** Boston: The MIT Press, 2006.

The authors analyse inequalities between rich and poor nations in the negotiation of global climate agreements. They argue that the current policy gridlock will only be resolved by reaching a North-South global climate pact that also strikes a global bargain on environment and development.

**The suicidal planet: how to prevent global climate catastrophe, Mayer Hillman, Tina Fawcett and Sudhir Chella Rajan.** New York: Thomas Dunne Books, 2007.

An overview on global warming and what we can do about it, this book explains what role technology can play, how you and your community can make changes, and what governments must do now to protect the planet for future generations.



Port Vila, Vanuatu, May 2007. Photo: Mary Wareham.

# The development of biofuels in the Pacific

MARY WAREHAM, OXFAM

As Pacific governments cast around for ways to boost their economic development, they are paying particular attention to the potential for a silver lining in the very dark cloud posed by climate change. The Pacific is one of the most vulnerable regions to the adverse impacts of climate change, but there are also possibilities that it could gain from the financial windfall of funds and incentives due from the world's major polluters.

**A**t their August 2007 meeting, the Pacific's trade ministers decided to seek assistance to develop greenhouse gas emissions reductions projects through the Clean Development Mechanism (CDM) of the Kyoto Protocol on climate change. The CDM allows industrialised countries with a greenhouse gas reduction commitment (called Annex 1 countries) to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. Just two of the 765 registered CDM projects were located in the Pacific.<sup>1</sup> Of the CDM's 2,400-plus planned projects, none are located in the Pacific.<sup>2</sup>

In Aotearoa New Zealand, a M ori tribe has set-up a major afforestation project using

global funds that will turn up to 30,000 hectares of Ngati Porou land in the east cape of the North Island into forests and provide M ori with direct access into emerging carbon trading markets.<sup>3</sup> Planting trees is one of the most well-known of the carbon offset projects but there are many other forms under Kyoto. For example, Vanuatu is seeking to benefit from funding for avoided deforestation, which amounts to avoided carbon emissions (deforestation accounts for approximately 20% of global human-made carbon emissions).<sup>4</sup>

Pacific attention is also turning to biofuels, not only to displace highly expensive fossil fuel imports, but also as a potential source of revenue, to stimulate agricultural development, improve fuel security, and generate sustainable livelihoods.

Currently bioethanol and biodiesel are the most commonly available biofuels, while biobutanol is a third potentially important fuel. Sugarcane makes a more efficient bioethanol feedstock than wheat or corn, as the latter two contain starch that must first be processed into sugar before distillation can begin. Bioethanol is typically blended with petrol for vehicle fuel, removing the need for engine modification or, alternatively, it can be used in specially designed or modified cars. Biodiesel is refined from vegetable oils including oil palm and coconut oil or copra, as well as from animal fats and recycled cooking oil, and can be used in diesel engines.

Whereas fossil fuels are comprised of carbon that has been locked away from the biosphere and atmosphere for millions of years,



biofuels on the other hand, are made of carbon that was taken out of the atmosphere by plants and animals a few years (crops) or decades (wood) ago. This makes biofuels both renewable and potentially carbon neutral (depending on the carbon footprint of the particular biofuel in question).

The idea that biofuels can be 'carbon neutral' has forced them up the policy agenda of governments struggling to meet their greenhouse gas (GHG) emissions targets and made

## There is a real concern that the demand for biofuels will force cash crops into competition with food crops.

them eligible for carbon credit programmes. Many countries are also setting domestic targets for biofuel content in vehicle fuel in an effort to reduce their reliance on oil. The European Union has set a mandatory target of 10% biofuel blend in vehicle fuel by 2020.<sup>5</sup> Earlier this year, President Bush called for alternative fuels including biofuels to replace 15% of US gasoline use over the next ten years.<sup>6</sup> In February 2007, the New Zealand government announced that 3.4% of fuel companies' sales will be comprised of biofuel by 2012.<sup>7</sup>

These new energy policies are creating huge demand for biofuels, which are most successfully grown in the tropical climates of developing countries but can also be efficiently derived from purpose-grown or agricultural and forestry waste material in temperate climates.<sup>8</sup> Brazil, the world's largest bioethanol exporter, intends to double its production of this biofuel over the next decade.<sup>9</sup> Malaysia and Indonesia recently set aside 40% of their oil palm production for biodiesel, and are rapidly expanding land available for oil palm cultivation.<sup>10</sup>

Yet this wave of enthusiasm for biofuels masks some serious problems. Firstly, biofuels are *not necessarily* carbon neutral: there are carbon emissions associated with every stage of their production and distribution from the manufacture and eventual breakdown of nitrogen based fertilizers to the use of (fossil fuel-powered) agricultural machinery to the transportation of the fuel in (fossil fuel-powered) tankers.

Secondly, biofuels are increasingly being developed at the expense of natural carbon reservoirs and sinks as rainforest and peatland are destroyed to make way for plantations of sugarcane, oil palm and soy plantations. In this, biofuels may actually increase overall carbon emissions if they are not well planned. The mono-cropping associated with many forms of industrial biofuel production is resulting in a massive loss of biodiversity, especially in key biodiversity hotspots such

as Indonesia and the Amazon Basin, which house massive amounts of rainforest carbon.

Another serious problem with biofuels is the many potential social costs associated with their production. Those working on biofuel plantations often experience harsh conditions, low wages and low job security. The industry has also been tarnished by cases of child labour. As biofuel plantations are established, there have been numerous cases of abuse of customary land rights, displacement

and violent conflict. In May 2007, the chair of a United Nations Permanent Forum on Indigenous Issues, Victoria Tauli-Corpuz, said that five million indigenous people in the Indonesian province of West Kalimantan will likely be displaced because of biofuel crop expansion.<sup>11</sup>

Finally, there is also a real concern that the demand for biofuels will force cash crops into competition with food crops, pushing food prices up further and lowering local food security. There is plenty of evidence that this is already happening, with significant price increases in sugar, corn, rapeseed oil, palm oil and soybean markets all being linked to rising biofuel demand. This is having a direct impact on the affordability of food in developing countries. In February 2007, tens of thousands of people marched through Mexico City to protest against the rising price of tortillas. Many blamed the 400% price hike for corn maize on increased US demand for bioethanol.<sup>12</sup>

Despite these potential drawbacks, the emerging demand for biofuel represents a significant opportunity for many developing countries. On a macro-level, domestic bio-

New Guinea exported 362,000 tonnes of oil palm, a 23% increase on 2005 and the only agricultural commodity increase in export volumes.<sup>13</sup> Oil palm production is the country's largest agricultural export; production takes place on foreign-owned estates in which small-scale growers contribute a substantial share of total production.

Production of oil palm is a more difficult proposition for the majority of Pacific islands, as they are highly vulnerable to cyclones. Oil palm is a fragile crop that is especially susceptible to high wind damage from cyclones. Another drawback to the development of oil palm in the Pacific is the way in which the crop is grown on a large-scale. This puts communally-owned lands at risk and increases food insecurity as land traditionally set aside for small-scale production of food crops is lost.

Copra could provide a more appropriate alternative biofuel source for Pacific countries. The crop is abundant and relatively simple to process, but the viability of exports are dependent on fluctuating international commodity prices. In Vanuatu, the country's main power supplier, UNELCO, is trialing the use of coconut oil in domestic biodiesel consumption. Currently, between 10-15% of coconut oil is filtered and mixed with diesel for use in selected vehicles and UNELCO diesel generators, a proportion that would increase if the coconut oil was processed into biodiesel.<sup>14</sup>

It remains to be seen if the poorest developing countries will be able to develop viable biofuel industries without substantial assistance. Many might be able to produce significant amounts of feedstock, but the development of biofuel production capacities can be difficult and expensive, requiring significant state support (or support from the private sector seeking to invest in climate-friendly industries in the context of the voluntary car-

## Biofuels can offer an opportunity to stimulate agricultural development for small-scale farmers.

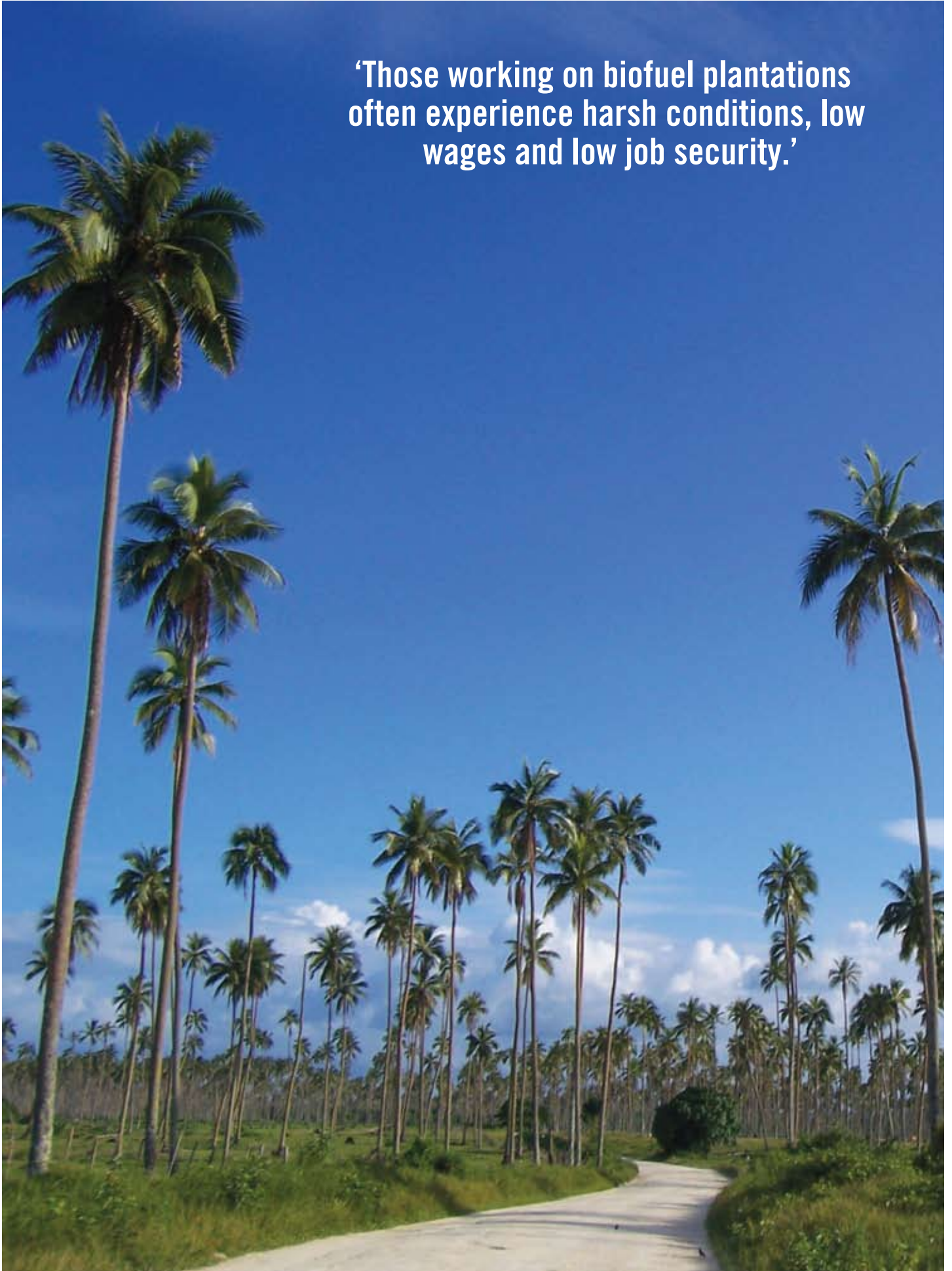
fuel production, as illustrated in Brazil, can reduce dependency on fossil fuel imports, increase energy security and strengthen the balance of payments. Developing countries with significant biofuel programmes may sell carbon credits to countries with GHG reduction commitments under the Kyoto Protocol's Clean Development Mechanism. On a micro-level, biofuels can offer an opportunity to stimulate agricultural development for small-scale farmers.

The biodiesel oil palm is principally grown by countries located on or near the equator, including Indonesia, Malaysia and, increasingly, Papua New Guinea. In 2006, Papua

bon market).<sup>15</sup> Every country with a biofuel programme has provided subsidies; it took 30 years of subsidisation in Brazil to produce the world's only commercially viable sector, and the government still provides some support in the form of tax breaks.<sup>16</sup> The opportunity for Pacific countries to kick start their domestic industries may be removed in the spate of trade deals that are being negotiated by Pacific trade ministers.

Biofuels offer an enchanting solution for those wishing to keep growing and functioning as 'normal', but in a more sustainable way. They can lessen the impact of driving and flying as usual, something we all are coming

**‘Those working on biofuel plantations often experience harsh conditions, low wages and low job security.’**



Copra plantation. Santo, Vanuatu. Photo: Timothy Hewitt



to recognise is unsustainable and bad for the planet. But even major oil companies that have been trumpeting biofuels warn that it will not be possible to meet rising world energy demand without fossil fuels.<sup>17</sup> Greater emphasis is needed on initiatives to reduce demand for fossil fuels through energy efficiency, the development of alternative energy sources and by increasing global biogenic (living) carbon stocks (through forest conservation, forest plantings and agroforestry for food production).

Policies and guidelines for biofuel production must be put in place to ensure that poor people and the environment are the winners, not the losers from biofuels. Food security, biodiversity, customary land tenure, labour rights, and the preservation and promotion of small farmers' livelihoods must be protected through regulation of the biofuels industry.

Oxfam, along with others, is grappling with the dilemmas posed by climate change and the response to it, including biofuels. All possible methods to reduce greenhouse gas emissions and prevent further climate change must be seriously considered so that urgently-needed action to keep global warming below 2°C can be taken. There is no 'silver bullet' however, and we must be careful that attempts to combat climate change do not happen at the expense of the environment or poor and vulnerable people.

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- 15 Carbon finance includes carbon credits traded in the Kyoto (compliance) market, but also involves the trading of carbon in the voluntary carbon market which is not subject to the Kyoto rules. Demand for carbon credits in the voluntary market is driven by countries such as the US or certain sectors such as aviation that are not subject to the Kyoto Protocol.
- 16 Kojima, Masami and Todd Johnson. 'Potential for Biofuels for Transport in Developing Countries', *ESMAP Knowledge Exchange Series, No. 4*.
- 17 Macalister, Terry. 'Renewables Are Not Enough, says Shell Chief', *The Guardian*, 26 June, 2007.

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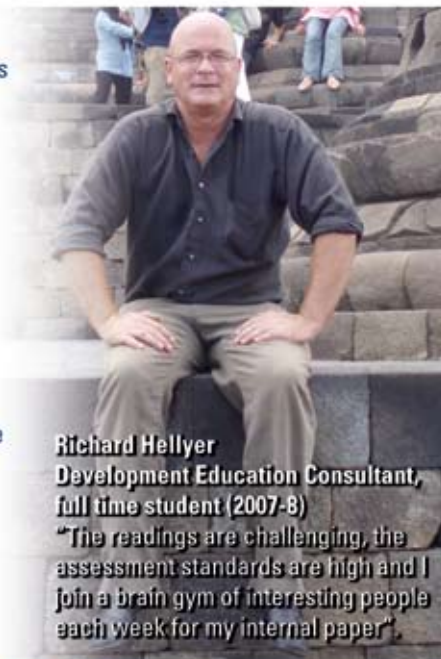
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# Listening to a whisper

## Gender and vulnerability to climate change

SHARYN BROWN

There is much talk in the print media and on television about melting ice caps, rising water levels and gloomy predictions of an ice age in Europe. Global warming, it seems, is only going to happen to the 'us' of the industrialised world. However, it is those who are most poor – particularly those in developing nations – who are most vulnerable to the often disastrous impact of climate variation. Up to three quarters of those living under the poverty line globally are women, and are therefore disproportionately at risk. In addition to poverty, there are other factors contributing to women's increased vulnerability to climate change.

Women in developing nations are much more reliant on primary resources – water and firewood – and far more likely to be involved in the agricultural sector. Both agriculture and primary resources are climate sensitive; changes in global temperatures can result in devastating losses of crops and water scarcity or flooding. Climate variation radically alters the ecosystems in which women make their livelihoods, resulting in lowered nutrition, lowered income and increased workload or displacement.

Women in the developing world are more likely to have fewer resources to adapt to, or recover from, climate change. Women often face cultural constraints in their access to and control over resources, such as land. This means that they rarely have access to alternative sources of income that would enable them to adapt and diversify. Likewise, women are

far less likely to have insurance and reserves for when disaster strikes. Another constraint is that women's participation in education is limited in many developing countries and this is compounded by reduced nutrition or increases in workload caused by climate change. They are forced to continue in livelihoods that are less and less viable as climate change increasingly alters the landscape.

There are a range of factors that disproportionately increase the vulnerability of women in developing countries to natural disasters; they may be less likely to know how to swim,

**The words 'women' and 'gender' are not found in the United Nations Forum for Climate Change Convention or the Kyoto Protocol.**

they may face social taboos surrounding leaving their homes and congregating in other places – preventing women from seeking help early enough. Women are more likely to have children to care for, and may wear clothing that restricts their mobility, both of which could slow them down when fleeing from disasters such as tsunamis or earthquakes. They may be ashamed of being seen in wet clothes or using public facilities. All of these factors may radically decrease a woman's ability to care for herself in the advent of a sudden catastrophe. Lacking the necessary resources to escape, adapt or merely survive, women become quiet victims of the ever-encroaching threat of

climate change. It is estimated that 90% of the victims of the 1991 floods in Bangladesh were women and children, an astonishing statistic almost too enormous to comprehend.

It is tempting to despair. Not only are women victims of climate change, they are also victims of exclusion from the debates and negotiations surrounding climate change on a global scale. The words 'women' and 'gender' are not found in the United Nations Forum for Climate Change Convention nor the Kyoto Protocol. They are not listed as stakeholders; they are barely represented in the debates.

But women are not just victims. Across the globe, women and their organisations are at the forefront of environmental protection movements. Although the outlook seems bleak, there are opportunities to improve women's lives through education and capacity building, access to new, clean technology and mitigation projects. Women are not only hapless victims who are being washed away in a flood of water and inequality, they are actively mobilising, particularly in the area of environmental protection and reforestation. A respectful and sensitive approach to involving women's expertise in climate policy and action is not only important for sustainability, it is also crucial in returning to women the equality that is their right.

*Sharyn Brown is a graduate student studying International Rural Development at Lincoln University, Christchurch, Aotearoa New Zealand.*

### BOOKS FROM THE DEV-ZONE LIBRARY

HE PUKAPUKA MAI I TE KOHINGA A DEV-ZONE



**With speed and violence: why scientists fear tipping points in climate change, Fred Pearce. Boston: Beacon Press, 2007.**

The author presents frightening predictions about the consequences of increased global warming, arguing that stresses of human interference mean irreversible changes may threaten the habitability of the planet. This book makes the complex science behind climate studies accessible.

**An inconvenient truth: the crisis of global warming, Al Gore. London: Bloomsbury, 2007.**

What do you think about global warming? Do you care enough about the earth's future to get involved? What can you do to deal with a crisis? These and many other important questions are answered in this book; it is not too late to save the planet.

**Planet in peril: an atlas of current threats to people and the environment, Alain Gresh, Philippe Rekacewicz and Dominique Vidal (eds.). Paris: UNEP/GRID-Arendal, 2006.**

This atlas illustrates the interplay between population and the world's ecosystems and natural resources, addressing key issues such as climate change, access to water, exploitation of ocean resources, nuclear energy and waste, renewable energy, weapons of mass destruction, waste, hunger, and access to health care.

**Confronting climate change: critical issues for New Zealand, Ralph Chapman, Jonathan Boston and Margot Schwass (eds). Wellington: Victoria University Press, 2006.**

With contributions by leading scientists and policy experts, this book presents the latest scientific evidence, examines the likely impacts of climate change on Aotearoa New Zealand and the Pacific, and outlines a range of policy solutions.

**People and the environment on the edge: environmental vulnerability in Latin America and the Caribbean, J Timmons Roberts and Bradley C Parks. London: Catholic Institute for International Relations (CIIR), 2004.**

In Latin America and the Caribbean it is poor people who suffer

most from environmental degradation resulting from historic exploitation. The authors argue that neoliberal structures are the root causes of the region's 'environmental vulnerability', whereby poor people are most vulnerable to the stresses that the modern world places on the environment.

**The economics of climate change: the Stern review, Nicolas Stern. Cambridge: Cambridge University Press, 2007.**

There is now clear scientific evidence that emissions from economic activity are causing changes to the earth's climate. The Stern Review, conducted by Sir Nicholas Stern, Head of the UK Government Economic Service, and a former Chief Economist of the World Bank analyses the economic aspects of climate change to better inform an effective global response.

**Just one planet: poverty, justice and climate change, Mark Smith. Warwickshire: Practical Action, 2007.**

The impacts of climate change are felt around the world; however, it is the 2.7 billion people who live on less than \$2 a day who will be hit first and hardest. This book makes the links between consumer and political choices in the North, and the impacts on the global South.



# Interview

## An interview with Annie Homasi, coordinator of the Tuvalu Climate Action Network and the Tuvalu Association of NGOs.

### Q: What does the Tuvalu Climate Action Network do?

A: The Tuvalu Climate Action Network (TuCAN) was set up in response to an urgent need for a global commitment to reduce warming to well below dangerous levels and the equally urgent need to raise awareness on adaptation to climate change and implement clean energy for Tuvalu. It is a nationwide network that will be responsible for being the voice of all NGOs in Tuvalu on climate change, working to coordinate and implement climate change activities and issues that are of direct relevance to NGOs.

TuCAN members place a high priority on both a healthy environment and development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

### Q: How high is the level of awareness among Tuvaluans about the impact of climate change in Tuvalu and what are people doing about it?

A: Local awareness is still very low, hence the work of TuCAN to promote awareness.

### Q: You mention in a previous interview with WWF that a lot of people think that God will protect Tuvalu because of God's covenant with Noah. How difficult is it to educate, or convince, people about climate change?

A: Very challenging, more so with the older generation.

### Q: You've commented at a recent presentation in Aotearoa New Zealand that Pacific Island countries are the most vulnerable to the impacts of climate change. Do you think that the interna-



Coastal erosion. Photo: TANGO

**tional community – for example, the United Nations, Australia, and Aotearoa NZ – is adequately responding to the crisis of climate change in the Pacific, specifically in Tuvalu?**

A: Countries must cut greenhouse gas emissions by 50-58% by 2050. Australia MUST ratify the Kyoto Protocol.

### Q: What can Aotearoa NZ do to assist Tuvalu in coping with climate disasters? Would it be better to focus on raising the Tuvalu immigration quota in preparation for Tuvaluans needing to leave their homes, or are there other things, for example, helping to build sea walls?

A: New Zealand is opening its doors for migration and the younger generation are taking up these opportunities and this should be encouraged more.

### Q: What do you think needs to happen to ensure the safety of Tuvalu?

A: The international community needs to work together to cut greenhouse gas emissions. Global emissions must start to fall; [we must] implement widely renewable energy and energy efficiency.

To find out more, go to <http://tuvalutango.org>.



Flooded crops during the King tide. Photo: TANGO



King tides. Photo: TANGO



Flooding inside homes during the King Tide. Photo: TANGO



# NOAH'S ARC TO SAVE DROWNING TUVALU

Boats from Marine Training School carrying islanders to Amatuku Islet. Photo: Shawn Shen.

SHAWN SHEN

**M**any people of the world put their faith in God's promise to Noah: *And I will establish my covenant with you; neither shall all fesh be cut off any more by the waters of a food; neither shall there any more be a food to destroy the Earth. Genesis 9:11.* The story of Noah's Arc was in the minds of many Tuvaluans when they were asked about the rising seas.

No country seems more convinced that it faces the imminent threat of climate change than the Pacific atoll nation of Tuvalu. Tuvalu has been increasingly under the spotlight over the climate change debate, as the nation could become the first in the world to be submerged by rising sea levels.



Vanuatu houses built off the ground to avoid flooding. Photo: Shawn Shen.



## Is the sea rising in Tuvalu?

Many locals might not know exactly what 'global warming' is, but certainly the frequent saltwater flooding, accelerated coastal erosion and increased difficulty to grow vegetables and plants have all become day-to-day challenges.

Like many Pacific countries, the 'land' connotes unique social and cultural meanings with power-structure significance to already land-limited islanders. Losing 'ground' renders islanders landless, homeless, and without status. In the Tuvaluan language, 'Fakaalofa' refers to a landless person and its literal meaning is 'the one that deserves others' pity'.

With a chain of nine coral atolls and islets, Tuvalu is not only physically small, but also geographically flat; its peak elevation is less than 4.5 metres above sea level. As the entire population lives on the coastline, the immediate threat of rising sea levels is unavoidable. Tuvaluans undeniably face the prospect of 'climate change refugee' status and the survival of a nation will soon be in question.

There have been no cases where modern states have been obliged to cease to function as a result of environmental change. Yet, many vulnerable Pacific Island states, including Tuvalu, currently face the relocation of their whole populations.

The plight of Tuvalu also represents the test case of a tiny developing country of the South being victimised as a result of the climate change mess created by the developed North. Tuvalu deserves protection from the international community.

In 2001, Tuvalu requested assistance from Aotearoa New Zealand and Australia in relocating its population as and when human existence on the islands becomes untenable. Australia refused to consider admitting any environmental refugees displaced by rising sea levels. In contrast, Aotearoa NZ respond-



The rainbow is regarded by many Tuvaluan Islanders as a sign from God that there will be no future flooding. Photo: Shawn Shen.

ed to Tuvalu's pleas with a labour scheme that accepts up to 75 Tuvaluans per year to gain permanent residency. This quota policy is known as the 'PAC' scheme (Pacific Access Category); it allows selected nationals from Tonga, Kiribati and Tuvalu to migrate to Aotearoa NZ.

Although media rumours have suggested a nation-wide resettlement programme agreement made between Aotearoa NZ and Tuvalu, there has been no explicit policy to accept Pacific Islanders who have been environmentally displaced due to rising sea levels; as one Ministry of Foreign Affairs and Trade official asserted, 'There is no link between the PAC quota and climate change'.

Despite media reports that evacuation in Tuvalu is already underway, very few are leaving their home islands. This may be attributed to their preferred lifestyle for a peaceful society, where the extent of sharing, caring and extended family support could never be found elsewhere.

Alternatively, many Tuvaluans see the relocation opportunity as an 'unaffordable dream' when considering the total expenses involved

in the initial application process. Additionally, the difficulty of obtaining an approved, 'genuine' job offer from an Aotearoa NZ-based employer adds complexity to the migration trauma. One Tuvaluan community leader has condemned the PAC scheme of Aotearoa NZ as a new form of 'slavery immigration', in which educated Tuvaluans give up their stable, white-collar government employment in Tuvalu to end up being cleaners or fruit-pickers in Aotearoa NZ.

The United Nations Intergovernmental Panel on Climate Change (IPCC) estimates that the number of 'environmental refugees' will be magnified to 150 million in the year 2050. The impacts of these human migrations may be highly destabilising globally unless they are carefully managed. The IPCC 2007 report reiterates the impact of climate change on population relocation, warning that the 'implications for immigration and security in Australia and New Zealand are poorly understood'.

Tuvalu's future is beyond anyone's prediction. However, Australia's wait-and-see attitude and Aotearoa NZ's open cheque promises have undermined the implications for immigration and security in the era of climate change with ever-increasing numbers of climate refugees. Dealing with the problem in a planned and orderly fashion is the only way to avoid unmanaged flows of people across borders. To many Pacific Islanders, Aotearoa NZ could be that Noah's Arc and it should take the lead to fulfil its global citizenship responsibilities by looking after its sinking neighbours.

*Shawn Shen is a PhD candidate in Geography at the University of Otago, Aotearoa New Zealand. His current research examines involuntary migration from the Pacific Island developing states as a result of global climate change.*



Most local island homes are close to the water's edge. Photo: Shawn Shen.

# Pacific island vulnerability to tropical cyclones

## Facing the perils in a warming world

JAMES P. TERRY, THE UNIVERSITY OF THE SOUTH PACIFIC

**T**he most severe meteorological conditions in the South Pacific Ocean occur during tropical cyclones. Developing island nations are extremely vulnerable to their impacts, and their vulnerability may increase in future if climate change affects geographical patterns, occurrences, and characteristics of cyclones and storms.

A tropical cyclone develops over a large mass of warm ocean water, constructed of bands of cloud rotating clockwise in the southern hemisphere. Violent winds circulate inwards in a spiral pattern around a central eye of calm weather. At around nine per season (December-May), tropical cyclones occur relatively infrequently in the southwest Pacific, yet they can inflict great damage. They are often associated with the El Niño phenomenon (important temperature fluctuations in surface waters of the ocean). Cyclones can form quickly, bringing damaging winds and torrential rain, driving powerful waves against island coastlines.



Dead corals in a coastal lagoon on southwest Viti Levu Island in Fiji. These were toppled over by powerful currents generated during Tropical Cyclone Paula, March 2001. *Photo: James Terry.*



Huge waves produced by Tropical Cyclone Heta in January 2004 pound the coastline of Niue Island. *Photo: Emami Lui.*

### Impacts on island environments

Different types of islands in the South Pacific, such as volcanic, limestone and coral islands, suffer a range of effects from tropical cyclones, including damage to coral reefs, storm surges, coastal flooding, and shoreline erosion, large river floods, and landslides and erosion on steep hillslopes.

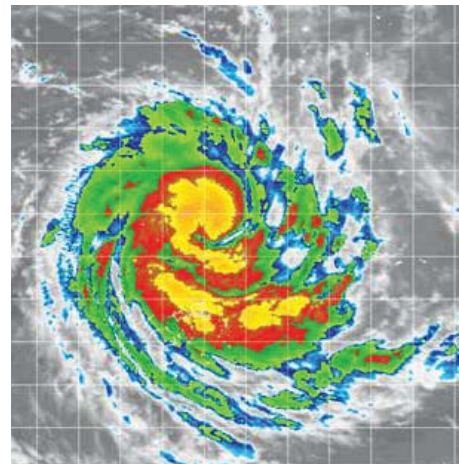
Cyclone Kina (January, 1993) was devastating for the Fiji Islands:

Fiji suffered its greatest ever financial loss, with destruction or damage to houses, property, infrastructure and crops, valued at nearly FJD170 million. Twenty three human deaths occurred and there was an unaccountable loss of livestock. Heavy rain and massive overflow of major rivers caused extensive flooding. Major disruption was caused to transportation as two main road bridges broke under pressure of torrential currents. A number of landslides cut road access to settlements inland. Crop damage [in some areas] was severe with almost total losses. Infrastructure suffered badly, with houses close to flooded river banks being swept totally off their foundations.

*Fiji Meteorological Service's report on Cyclone Kina.*

All of these impacts cause terrible human hardship, especially for the poor, and place a difficult economic burden on developing Pacific island states with limited resources.

Left: Destruction of buildings in the main settlement on remote Pukapuka Atoll in the northern Cook Islands after Tropical Cyclone Percy in February 2005. *Courtesy of Douglas Clark.*



Above: Tropical Cyclone Ami threatens Wallis and Futuna on 12 January 2003. *Source: US Navy.*

For these reasons, scientific investigation of cyclones is critical for implementing appropriate adaptation techniques for people living in South Pacific nations.

### Future concerns

Many scientists now believe that Pacific climates may experience more El Niño-like conditions in the future, owing to global atmospheric and ocean warming. There are potential implications for changes to established cyclone patterns, including increased cyclone intensity and shifts in storm origins, which will only worsen the vulnerability of South Pacific island nations to these extreme meteorological events. International assistance and national planning continue to be needed to prepare disaster management strategies and appropriate adaptation programmes.

*James P. Terry is a professor at the School of Geography in the Faculty of Islands and Oceans, The University of the South Pacific, Fiji.*



Flooding of the lower Lungga River near Honiara on Guadalcanal island in Solomon Islands, on 18 May 1986 during Tropical Cyclone Namu. *Courtesy of the Solomon Islands Department of Mines and Energy.*



# Managing climate change, Fijian-style

ALISI W DAUREWA



Fish wardens (L to R) Saimoni Tunidau and Taione Delai from Moturiki tending their coral garden farm. Photo: Partners in Community Development Fiji.

**T**ima had just returned from a successful fishing expedition. It only took her about two hours. Along with Mereani and the other women of the village, they made enough catch for lunch and dinner for their families that day.

'It wasn't always like this. Where we caught so much fish in so short a time', said Tima. Firstly, we used to have to go far into the sea to look for fish because they no longer appeared near our shores. It was difficult then and we never had the time to do other things at home because it used to take us a whole day to fish if we wanted a decent catch.'

'Establishing those marine protected areas or "no take" areas and the development of our own marine management plan, plus awareness-raising workshops held for the village have certainly paid off', added Mereani. Unbeknown to Tima and Mereani, they were addressing the challenges of climate change.

In coastal communities, women like Tima and Mereani are the primary fisher-folk. In some parts of Fiji, the women are the sole custodians of the 'I kanakana' (designated marine food garden near the shore). The 'I qoliqoli' (designated marine food garden) is usually under the stewardship of either the chief or the 'Gonedau' (traditional fisher-folk). Certain customary practices that still exist today show evidence of the inter-relationship between the woman and the sea; the sea is synonymous with motherhood, where

it nurtures the 'vanua' for sustainable livelihood, just as a baby is nurtured in a womb to sustain community and humankind.

Climate change in Fiji is not only about inconsistent rainfall and abnormally warm weather, it is a food issue. The effect of climate change on coral reefs is taking its toll and the people, in particular women and youth, are spending more time looking for fish, which in the past used to be sighted near their shores. Dr Austin Bowden-Kerby, the Fiji-based Project Scientist for Counterpart

## The sea is synonymous with motherhood, where it nurtures the 'vanua' for sustainable livelihood.

International (USA) and advisor to Partners in Community Development Fiji's Coral Gardens programme comments:

Low-lying tropical coastlines and atoll islands in particular are highly vulnerable to [climate change], and beach erosion and storm inundation of coastlines are predicted to increase. Reef-derived features such as calcareous sand beaches and atoll islands themselves ultimately depend on a carbonate sand and reef rock generation process that is directly related to the health, growth, and bio-erosion of coral reefs... Healthy coral reef systems produce up to three tons of carbonate sand per mile of reef per day, much of which is generated by par-

rotfish and sea urchins as they graze on dead corals. This sand feeds the beaches and fills the lagoons of tropical islands. However, over-fishing may disrupt this sand generation cycle that is so vital to the stability of beaches and shorelines of the tropical oceans.

A few years ago, some communities took ownership of their own development. In collaboration with local NGO, Partners in Community Development Fiji (PCDF), these communities decided to explore their past, re-discovering some amazing ancestral customary practices to 'bring back the fish'.

The village developed their own marine management plan to establish Marine Protected Areas (MPAs). Community-appropriate tools of engagement (Participatory Learning and Action) were used to assist the villagers in arriving at their own decisions. Workshops were held on site, and young local men were trained and registered as fish wardens by the Department of Fisheries to oversee and monitor the MPAs.

Funding came from donors such as NZAID, AusAID, MacArthur & Packard Foundations, Darwin Initiative, EED, and USAID. The private sector also helped out; support came from Shangri-La's Fijian Resort, Nacula Tikina Tourism Association, Dick Smith's operations and other kind partners. The Fiji Government provided technical assistance.

To date, Partners in Community Development Fiji has helped establish 54 MPAs in five provinces in Fiji.

Villagers now say that whole-day fishing trips have been reduced to a couple of hours because the fish have returned to their shore. Having more fish available and reduced hours to allow women more time with their families is a good indicator for their decision to re-establish MPAs. Youth can now devote more time to their plantations. The spirits of the land have blessed them for respecting their natural resources. They can only hope for more good things to come in the future.

*Alisi Daurewa is Executive Director of Partners in Community Development Fiji (PCDF). These are her personal views and not those of PCDF.*

# ‘THE TIDES ARE GETTING HIGHER AND HIGHER’

## A Pacific voice on climate change

LIZ MARTYN, CHRISTIAN WORLD SERVICE

**‘While developed nations quibble over the details of the Kyoto Protocol, Tuvalu islanders are literally losing their homeland,’ warned the Reverend Tafue Lusama of Te Ekalesia Kelisiano Tuvalu (the Christian Church of Tuvalu). ‘Climate change is not a future concern. It is an immediate threat.’**

Tafue was speaking at the Public Hearing on Climate Change and Sea Level Rise, organised by CWS partner, Pacific Conference of Churches (PCC), in Fiji in July. He called for the world to act – not debate – saying he was tired of his pleas about the great threat facing Tuvalu receiving only ‘sympathy without action.’

During the five-day hearing, representatives from Tuvalu, Kiribati and Greenpeace Pacific reported on the effects climate change is already having on their islands and way of life. For the Pacific people represented at the hearing, climate change is real and its impact is more advanced than most people realise.

The small increase in sea temperature is un-



dermining the food supplies and livelihood that Tuvaluans have relied on for centuries. Coral has been bleached and is dying, forcing the fish that used to feed on it to move to other waters. The warmer temperature is changing current flows, causing a decline in island fish stocks. Fishing canoes must travel much further into more difficult and dangerous water to make their daily catch.

**People have been forced to grow root crops in buckets instead of in the ground, as there is too much salt in the soil.**

Extreme weather events are increasing, with coastal erosion accelerating. In 1997, large waves from Tropical Cyclone Keli washed the entire Tuvaluan island of Tepuka Savilivili out to sea, leaving nothing more than a bare stump of jagged coral behind. Other atolls have disappeared. Climate refugees have already fled from the Carteret

Atolls in Papua New Guinea and some islands in Kiribati and Vanuatu.

Over the last ten years, the high tide in Tuvalu has increased between 25 and 90cm, a huge challenge to a country on average only 1.8m above sea level. Now, during the king tides in February, water flows through houses, which it has never done before. People say you can get in your canoe and paddle right into the living room. Many families have moved further inland, but there is not much higher ground left.

The inundation of water from the higher tides brings yet another problem – contamination. 60% of ground water in Tuvalu is now salinated. People have been forced to grow root crops in buckets instead of in the ground, as there is too much salt in the soil. The decline in fresh water drinking supplies and crop production adds to food security and economic concerns.

With the loss in fishing and cultivation, Pacific people are worried about their growing dependence on outside aid and imported processed foods, and the economic viability of their island nations. But the overriding





The inundation of sea water is an increasingly common occurrence on Kiribati. Photo: Kiribati Protestant Church.

‘Memory is all that the Tuvaluans will have left of their homeland. Their burial grounds, their schools, their homes, their churches will be enveloped by the ocean. The Tuvaluans can never go home again.’

Pacific people are trying to adapt to the new conditions. In some places, they are changing their style of housing, building on stilts with the ocean able to flow under their homes, but rising sea levels make this a short-term solution. There are only a limited number of viable alternatives and the available resources will come under increasing pressure as low-lying islands lose access to land, potable water and food.

Pacific Island nations are taking steps to minimise their ecological footprint by adopting renewable power generation methods and reducing face-to-face meetings that require air travel, but they realise the problem is not just theirs. They are looking to Aotearoa New Zealand and Australia to help get the Pacific voice heard. They want international acknowledgement that climate change is real and some reassurance that other countries will be prepared to accept environmental refugees.

While Kiribati, Tuvalu, Papua New Guinea and the Marshall Islands are at greatest risk, all Pacific nations are concerned about their future. The PCC hearing concluded that, ‘giv-

en that global carbon loadings are continuing to rise, it may already be too late to take adaptive measures for Kiribati and Tuvalu and other atolls’. The severity of the impact of climate change is expected to increase whatever Pacific peoples do to try to cope. The PCC is now advocating for rights to resettlement, reduction of carbon dioxide in the Pacific, increased financial assistance to adapt to new climatic conditions and possible resettlement, support networks if people have to leave their lands, and increased awareness of the catastrophe facing the Pacific.

*Liz Martyn is the Communications Manager for Christian World Service in Aotearoa New Zealand. The Pacific Conference of Churches (who organised the conference) is one of CWS’s development partners. Contact CWS for more information about their work at [cws@cws.org.nz](mailto:cws@cws.org.nz) or phone 03 366 9274.*



Bleached coral, one of the manifestations of climate change affecting food supply for Pacific Islanders. Photo: Kiribati Protestant Church.

fear is the loss of identity and culture.

‘The identity of a people is strongly linked to the environment. If you move a people you lose a people’, says Tafue. ‘What happens when more of these island nations disappear, potentially displacing seven million people? What are the economic and security implications of disappearing exclusive economic

**In 1997, large waves from Tropical Cyclone Keli washed the entire Tuvaluan island of Tepuka Savilivili out to sea, leaving nothing more than a bare stump of jagged coral behind.**

zones? Can there be compensation for the loss of a country, its history, its culture, its way of life? How do we put a price on that? Who will pay it?’

If this happens and Pacific Islanders are forced to relocate, ‘They will enter into a world that is not their own’, claims Tafue.



Flooding inside and around homes during the King Tide, Tuvalu. Photos: Ekalesia Kelisiano





Boera village as seen from a nearby hill. Photo: Stewart Serawe.

# Revitalising customary knowledge to cope with disasters in the face of global warming.

STEWART SERAWE, FOUNDATION FOR PEOPLE AND COMMUNITY DEVELOPMENT, PNG

**S**ome of the most violent and destructive disasters occur in Papua New Guinea (PNG). While some may dispute that the increasing frequency and intensity of disasters is due to global warming and changes in weather patterns, in PNG, global warming is held largely responsible. Thousands of people have been killed, and the cost of destruction to property and infrastructure has run into millions of dollars.

Climate change displacement is taking place in the small islands located northeast of Bougainville. Rising sea levels will continue to affect people living in coastal and lowland areas. This problem is compounded by a shortage of groundwater which makes populations particularly vulnerable. While some residents are able to move to higher ground, others may need to relocate permanently to the mainland or larger islands.

Concern over disasters has prompted an increased engagement of agencies addressing them. The Foundation for People and Community Development (FPCD), an NGO based in Port Moresby, has become active over the past two years in community-based disaster preparedness training. One community benefiting from FPCD's intervention is Boera village, a disaster-prone community in Central Province.

The goal of the FPCD-Boera Disaster Preparedness Project is to improve disaster management practices to build safer communities. The objectives are to:

- Provide information and skills necessary for communities to understand and fulfil



- their roles in disaster preparedness
- Facilitate communities' assessment of their hazards, vulnerability, capability and risks through Community Action and Participation and to assist them in identifying risk reduction solutions and develop risk treatments
- Assist communities to develop their baseline information for monitoring purposes, development, planning, emergency operation and initial damage assessments.

**The dry seasons these days are getting longer and hotter because of destruction to rainforests in general and to what we hear as greenhouse effect and global warming.**

Boera was recommended by the Central Provincial Disaster and Emergency Services; the decision was based on its relative vulnerability to disaster. The community experiences ongoing natural disasters such as floods, droughts, king tides and cyclones. It suffers annually from what is locally referred to as 'doe', which crudely translates to 'famine', where the general population do not have enough food to eat. According to village elders, 'doe' results from primarily insufficient rainfall followed by a prolonged dry season, usually with very high temperatures killing food gardens. The majority of the population – subsistence farmers and fishermen – resort to gathering wild yams in the surrounding hills and vigorous fishing for consumption.

Mr Muri Henao, a retired public servant, observed, 'In the old days, our forefathers organised 'hiri' voyages. They traded with people from the Gulf Province, bartering clay pots for sago during dry seasons'. He added, 'the dry seasons these days are getting longer

and hotter because of destruction to rainforests in general and to what we hear as greenhouse effect and global warming'.

Over the years, Boera has experienced a population increase, and with it the harvesting of surrounding mangroves and trees for building houses and stilts. Around 80% of houses are constructed over the sea. Removing mangroves and trees and consequently exposing coastlines have been a big problem contributing to disaster events in Boera.

'We now experience unusually high sea levels', explained Boera village councillor, Mr Maraga Loa. 'Our bore water is now salty. Food gardens and other economic crops are burnt dry by salt water. When such disasters occur in our area, there is no government or NGO assistance. We agree to this type of disaster preparedness training to organise ourselves to help our community members when disaster strikes'.

To minimise further impacts of disasters, some of the activities undertaken include replanting mangroves and trees along the coastlines and in the village, elders educating youth on traditional food preservation and storage techniques, and awareness-raising on

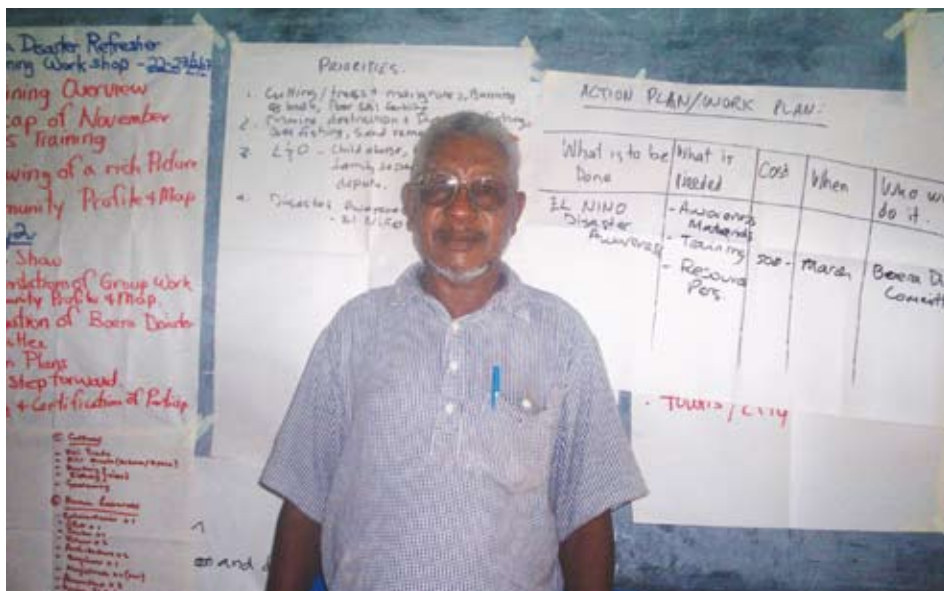
human activities that contribute to disasters, such as bushfires.

FPCD organised disaster planning and capacity building sessions with two representatives from each of the 14 clans making up Boera. These individuals now form the Boera Disaster Preparedness Committee; taking charge of educating villagers and mobilising them to be self-reliant. Part of the Disaster Preparedness Committee's responsibility includes collecting and disseminating information on the effects of climate change, and the roles of forests and mangroves in mitigating associated adverse effects. This work is funded by the Media Council of PNG through its Media Development Initiative.

With the replanting of mangroves and trees, it is hoped that Boera will be protected from sea level rise, high tides, and king tides, as well as acting as future sources of fuelwood and building construction materials. Fish stocks will be replenished as the mangrove areas will become breeding grounds. The water table will be replenished with freshwater and bore water used for the household as well as irrigation. Life in Boera should return to normal.

*Stewart Serawe is the Special Projects Manager at the Foundation for People and Community Development Inc. in Papua New Guinea (FPCD). FPCD works to support Papua New Guineans to develop and manage their own forest resources towards environmental, economic and social benefits. To find out more, go to [www.fpcd.org.pg](http://www.fpcd.org.pg).*

**Our bore water is now salty. Food gardens and other economic crops are burnt dry by salt water.**



Councillor Maraga Loa chairing a planning meeting of the Boera Disaster Preparedness Committee. Photo: Stewart Serawe.



Some members of the Boera Disaster Preparedness Committee with FPCD staff. Photo: Stewart Serawe.

# The Vanuatu Carbon Credits Project

Supporting Pacific development through reducing emissions and protecting forests.

ISABEL HEYMANNS, VICTORIA UNIVERSITY OF WELLINGTON

Carbon emissions from deforestation and forest degradation (DFD) account for 20-30% of global carbon emissions. Vanuatu, like other Pacific Island Nations, is endowed with tropical forest, much of which is yet undisturbed by logging. Mitigating climate change by avoiding emissions from DFD in developing countries must address the underlying causes of deforestation in those countries, which are commonly associated with demand for basic economic development at the local and/or national level.

A collaborative project between the Government of Vanuatu, Victoria University of Wellington, Climate Focus in The Netherlands, ESA GOFC-GOLD in Germany and GtripleC in Wellington is currently investigating the viability of an integrated climate change mitigation and sustainable development project to protect the forests of Vanuatu from logging. Finance for the project would come from carbon credits sold by Vanuatu on international carbon markets, with the number of credits being equivalent to the emissions avoided if the forest is protected and not deforested. The project aims to generate forest protection projects and to use these experiences to contribute to international policy development under the UN Framework Convention on Climate Change.



Deforestation. South Santo, Vanuatu. Photo: Sean Weaver.

Victoria University students Mandy Leathers, Olivia Warrick and Tim Hewitt, with project leader Dr Sean Weaver visited Vanuatu to meet with government officials and NGOs to discuss the project's feasibility. They also worked with a small island community to identify local drivers of deforestation and local development needs and goals, as well as factors necessary for the project's success.

The main reasons for Vanuatu's increasing DFD are logging and forest clearance for cattle farming and subsistence agriculture. There are strong economic incentives to allow continued deforestation, including the lucrative royalties received from logging companies and the provision of jobs and income for local people. With the government promoting investment in beef export, there is also an increasing demand for land for cattle ranching. Areas with particularly valuable timber species, including Kauri, are targets for large-scale commercial logging operations. With access to ports and markets as an important factor, low-lying coastal land has been targeted; in many areas, such as South and East Santo, environmentally and culturally significant lowland coastal forest is becoming scarce.

Timber, as well as cash-crops, grown on cleared land, constitute some of the only income-generating activities for local people. Increasing need for monetary income has

emerged over time with the transition from 'traditional' to more 'modern' systems. For example, school fees and church donations are two of the main expenses for rural families. These deforestation drivers are common throughout Vanuatu, especially on the island of Tanna, where extensive forest degradation is occurring as a result of very high population density.

Improving water security was acknowledged as the main locally-identified community development need. Other needs included addressing social issues, such as resolving disputes, along with facilitating education and skill-building. An avoided deforestation project would need to build local capacity within communities to strengthen indigenous systems of governance and enable local people to meet their goals. Such a project can be successful where there is a strong community commitment, while conflicts such as land disputes may be barriers to success. A community pilot project will be important in providing prospective communities with evidence of success.

Carbon finance provides a tremendous opportunity to protect forests and at the same time enable true sustainable development in developing countries. Even though delivering development is not the core goal of climate change mitigation, it is clearly an integral means to this end when attempting to conserve forest-based carbon reservoirs.

The Vanuatu Carbon Credits Project is currently at the end of the first phase and the second phase will involve policy analysis and the development of three carbon finance incentive mechanisms to be tested in Vanuatu.

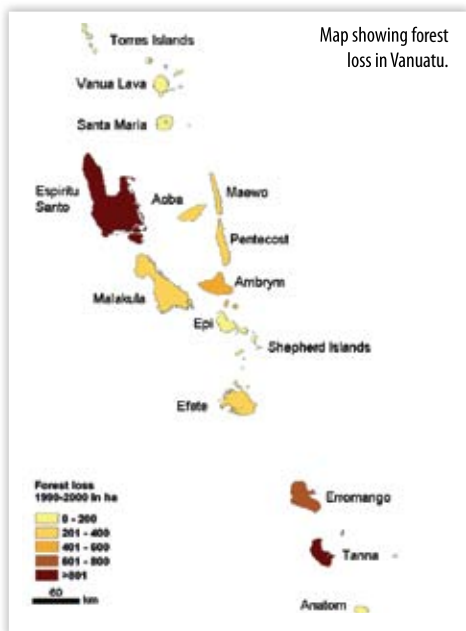
*Isabel Heymann is research assistant to Dr Sean Weaver in the School of Geography, Environment and Earth Sciences at Victoria University of Wellington, Aotearoa New Zealand. For more information visit: [www.geo.vuw.ac.nz/research/climate-change/vanuatu-forests](http://www.geo.vuw.ac.nz/research/climate-change/vanuatu-forests).*

## Carbon credits

Carbon credits and emissions trading are new financial mechanisms designed to help build a climate-friendly economy. A country, sector or community may set an emissions cap (for example, significantly lower than business-as-usual – as is the case under the Kyoto Protocol). Then it will allocate a finite volume of emissions permits to keep within this cap. Some participants will find it easier (more cost effective) to reduce emissions than others. This, in turn, forms the basis for a 'cap-and-trade' system for carbon. Here, those who overshoot their allocation can buy (with real money) 'carbon credits' from those who undershoot their allocation.

While carbon offsets enable one participant to buy the right to pollute (thereby shifting

emissions from one place to another), the whole system operates within an agreed emissions reduction programme for the whole community, sector or country. 'Emissions trading' makes it easier for carbon intensive industries to participate in the overall goal, whilst issuing a financial penalty for polluting. Paying this penalty does at least two things: firstly, it generates an incentive to invest (in-house) in climate-friendly innovations (making polluting industries less polluting); and secondly, it compels heavy polluters to provide financial support for (other) climate-friendly industries and activities elsewhere. This amounts to a new private sector source of sustainable development finance and adds value to money that governments need to spend to build a climate-friendly future.





# Shifting Tides

## Indigenous Responses to Global Climate Change

STEPHANIE PETER, PACIFIC PEOPLES' PARTNERSHIP

Aboriginal Canadians and Pacific Islanders understand that climate change is more than an environmental issue. The impacts of global warming are far-reaching, threatening to undo progress toward the achievement of the Millennium Development Goals as poverty and food insecurity increase. In response to this looming crisis, a delegation of Aboriginal Canadians and M ori Cook Islanders will begin a public engagement tour entitled, *Shifting Tides: Indigenous Responses to Global Climate Change* in November 2007. The tour is designed to link communities from across Canada with Rarotonga in the South Pacific, creating a space for indigenous voices to identify and gain access to tools and resources to confront climate change.

*Shifting Tides* is an initiative of Pacific Peoples' Partnership (PPP), a non-governmental organisation that has been working for more than 30 years with indigenous and civil society partners in the South Pacific and Aboriginal communities across Canada. The project is funded by the Canadian International Development Agency. *Shifting Tides* was a logical next-step for PPP in facilitating linkages between Canadians and Pacific Islanders after operating an international exchange programme that sent young indigenous Canadian professionals to the South Pacific for six-month periods through their Indigenous Peoples Abroad Program. *Shifting Tides* builds upon relationships formed through the Indigenous Peoples Abroad Program; the main partner in the Cook Islands is the Koutu Nui, a council of hereditary chiefs in Rarotonga who have a strong and demonstrated commitment to using traditional mechanisms in the promotion of sustainable resource use, reverence for the environment and the preservation of culture and language.

Members of the Canadian delegation were carefully selected and truly represent the diversity of Canada's Aboriginal peoples. The first, Larry Grant is an Elder from the Musqueam First Nation in Vancouver, BC. He is an Adjunct Professor at the University of British Columbia First Nations Languages Program and the Language and Culture Consultant and Resident Elder for the First Nations House of Learning. Earlier this year, he and his family travelled to Aotearoa New Zealand, where they visited several M ori vil-



Stephanie Peter with members of the Koutu Nui in Rarotonga. Photo: Pacific Peoples' Partnership.

lages during a one-month tour. As an elder and ambassador for the Musqueam Nation with strong connections to western academia, Larry brings a wealth of traditional knowledge and wisdom to the delegation.

The second member of the delegation is Shaunna Morgan, a member of the James Bay Crees of Waskaganish in northern Quebec. As an Aboriginal scientist and senior manager at the Centre for Indigenous Environmental Resources in Winnipeg, Manitoba, Shaunna brings her experience in working with Aboriginal communities and can speak to their struggles to develop climate change adaptation and mitigation strategies. Shaunna's ex-

### Climate change is more than an environmental issue.

pertise in facilitating the development of energy efficiency and renewable energy projects and developing community planning tools that take climate change into consideration will potentially benefit communities in both Canada and the Cook Islands.

The final member of the Canadian delegation is Mona Belleau, a Francophone woman from Iqaluit, Nunavut. Mona was the President of the First Nations Students' Society at Laval University where she obtained a Multidisciplinary Bachelor of Arts degree in Native Studies, Tourism Development and Communications and was a radio host for 'Voix Autochtones'. In 2005, Mona travelled to Aotearoa NZ where she worked for Wellington Tenth Trust as an Indigenous Culture and Tourism Programmer. Her knowledge of the Canadian North and her passion for indigenous tourism offer a unique Canadian

perspective on climate change issues.

The Koutu Nui will be sending two members: Imogen Ingram is the Secretary for the Koutu Nui and is very involved in climate change and the environment. Tekeu Framhein is a Vice-President and a former President of the Koutu Nui. He will focus on the traditional issues regarding Climate Change. The Koutu Nui is awaiting confirmation of their third delegate, Arona Ngari, who is the Director of the Cook Islands Meteorological Office.

The *Shifting Tides* tour will begin with a visit to Rarotonga in the first week of November, where the Canadian delegation will meet their Cook Islands counterparts. The entire delegation will then embark upon a tour of Canadian cities. The tour will culminate in Iqaluit, Nunavut in the far north at the end of November. A goal of the project is to increase Canadian understanding of the impacts climate change has on the economic and social well-being of indigenous peoples. In doing so, the project lays the groundwork for sound public policy recommendations and informed decision-making around mitigation and adaptation strategies that respect culture and traditional knowledge both in Canada and the South Pacific.

*Stephanie Peter* is a member of the Cowichan First Nation on Vancouver Island and a graduate of the Indigenous Peoples' Abroad Programme, where she worked with the Cook Islands National Environment Service in Rarotonga. She is the coordinator of the *Shifting Tides* project with the Pacific Peoples' Partnership. For more information about *Shifting Tides*, visit [www.pacificpeoplespartnership.org](http://www.pacificpeoplespartnership.org) or email [climate@pacificpeoplespartnership.org](mailto:climate@pacificpeoplespartnership.org).

# NZAID's role in the Pacific on climate change

MICHAEL HARTFIELD AND TOM WILSON, NZAID



People cleaning up after Cyclone Heta devastated Niue in 2004. Since then NZAID has provided post-cyclone rehabilitation including moving buildings and infrastructure, such as the hospital to higher ground. Photo: NZAID.

There's no doubt that climate change has risen in the global consciousness in recent years. Events like Hurricane Katrina and the film 'An Inconvenient Truth' have increased awareness in Western societies in particular. For decision makers around the globe, 2007 is an important year, with the release of the latest scientific evidence on global climate change. These four-yearly updates from the Intergovernmental Panel on Climate Change (IPCC) summarise the technical detail from thousands of peer-reviewed studies and translate them into predictions and likelihoods of future impacts.

Right now, NZAID is looking carefully at the IPCC reports, and talking to its partners to consider how best to respond to the latest data within a development programme focussed on poverty elimination and reducing hardship. NZAID's Pacific Regional Environment and Vulnerability Programme has plans to release a long-term strategy for consultation that sets priorities for NZAID's response in the Pacific.

The IPCC reports identify the Pacific as one of the most vulnerable regions in the world to the impacts of global climate change. This vulnerability – and the Pacific's relatively minute greenhouse gas emissions – means that adaptation to the effects of climate change is likely to be a priority. The IPCC forecasts a number of impacts in the region, including more intense tropical cyclones and changes in rainfall pat-

terns, which could lead to greater risks of flooding or drought. It is also predicted that the sea level will rise of up to 0.58cm per year (8-25cm by 2050). All of this points, in turn, to negative effects on important sectors such as tourism, fisheries, and agriculture, and possibly on human health. It paints a grim picture.

Climate change cuts across many areas. It can exacerbate a wide range of issues from access to water, to health, to cyclone vulnerability. These

are already important development issues for the Pacific, and in many cases these are the areas where NZAID is already working with its partners.

Bearing in mind the need to lessen the burden of our development programmes on our partners' systems, much can be achieved by simply enhancing NZAID's current support to these sectors. This would take advantage of existing relationships and build on what the Pacific has already started doing. For example, building NZAID's support to accessing water and preparing for cyclones will be an efficient way to deliver on climate change adaptation. These types of enhanced responses are likely to be as common as projects or programmes that have climate change as a particular or exclusive focus.

It is important to add that NZAID's support is focussed on responding to Pacific-identified priorities. The Pacific Framework for Action on Climate Change 2006-15 sets out the region's priorities. Currently, NZAID supports a range of Pacific regional and bilateral adaptation programmes. This includes ongoing financial and policy support to the Secretariat of the Environment Programme of the Pacific to develop the Pacific Framework and Action Plan on Climate Change.

NZAID also provides financial and policy support to the Secretariat of the Applied Geoscience Commission (\$1.5 million per annum). This contributes to assisting Pacific Governments to adapt to climate change by integration into national planning, enhancing disaster risk management and regional cyclone forecasting as well as increasing access to sustainable clean water and renewable energy supplies.

The role of the community is also important. NZAID supports community-level adaptation to climate change through co-funding the GEF Small Grants Programme in the Pacific (approximately \$4m over the period 2006-09). Climate change is one of five focal areas of the programme. The programme is open to civil society and community groups.

NZAID is a joint funder of the Kiribati Adaptation Programme, providing NZ\$1.52m to assist the Government of Kiribati to strengthen coastal defences, protect its freshwater, and storm-proof the local hospital. NZAID also supports renewable energy projects, such as solar electrification in Tonga. And when natural disasters do occur, support for post-cyclone rehabilitation takes place. Most recently, this included rebuilding Niue after Cyclone Heta, where buildings and infrastructure – such as the hospital – have been moved to higher ground in recognition of the need to plan in advance for high intensity cyclones.

There is much to be done, and we have to be realistic about what can be achieved, but

## NZAID's support is focussed on responding to Pacific-identified priorities.

with careful planning we can make sure that Aotearoa New Zealand's support to the Pacific makes a significant difference to improving the lives and livelihoods of Pacific people.

*The Draft Programme Strategy for NZAID Regional Environment and Vulnerability Programme is scheduled for public consultation from September 2007. Visit [www.nzaid.govt.nz](http://www.nzaid.govt.nz) for details.*

*Michael Hartfield and Tom Wilson manage the Pacific Regional Environment and Vulnerability Programme at NZAID Nga Hoe Tuputupu-mai-tawhiti, Aotearoa New Zealand's international aid and development agency.*



# Traditional Māori weather and climate forecasting

DARREN KING AND APANUI SKIPPER, NIWA

**T**hroughout the world, people are linked to natural ecosystems in diverse and dynamic ways. For indigenous people, like Māori, complex associations with the environment have developed over many centuries. These associations have social, economic, psychological, and spiritual dimensions that underpin culture and health.

Ever since M ori first arrived in Aotearoa New Zealand, the ability to understand and adapt to local climate has been vital to their survival. Over the centuries, M ori have developed an extensive knowledge of climate. The lessons learnt have been incorporated into traditional and modern practices of agriculture, fishing, medicine, education, and conservation. To M ori, the climate was governed by the months and seasons. The climate was marked by the local sequence of natural events, including the movements of stars, the blooming of certain trees and flowers, the arrival and departure of migratory birds, and the age of the moon. Learning to monitor and predict changes in climate – including shifts in temperature, direction of winds, and changes in the style of rainfall – helped M ori to determine the timing for different kinds of work. This knowledge has been a major factor in their successfully responding to past climate variability and change.

The National Institute of Water & Atmosphere's (NIWA) M ori Research and Development Group, Te K waha o Taihoro Nukurangi, in collaboration with iwi from across Aotearoa

NZ, has been exploring traditional M ori Environmental Knowledge (MEK) of weather and climate variability and change. Of particular interest is the linking of events in the natural world to the forecasting of climate.

The table below shows a small selection of environmental indicators used by M ori to forecast weather and climate. While the indicators have their greatest utility in their respective localities, many of them are shared by different iwi in other locations. Often more than one indicator is used to forecast for the month or season ahead. This consensus-based approach to climate forecasting is similar to western science forecasting methods, which also rely on a consensus among different computer models to forecast climate changes. While western forecasting methods have demonstrated significant skill and continue to improve, opportunities exist to increase the certainty of these tools by integrating traditional M ori knowledge of local climate. By building a collective database of traditional M ori knowledge related to weather and climate, a process of building greater resilience to future climate variability can be initiated.

The changes expected in the Aotearoa NZ climate over the next 50-100 years will have significant impact on the economic, social and cultural landscapes of M ori people. Recounts by t puna of historical events associated with prominent coastal features (for example, the names given to coastal land features by early M ori, p r kau) may be degraded or destroyed by sea-level rise, inundation and associated increases in coastal erosion processes. Climate-induced adverse impacts have also been projected for taonga species, including fish, tuna (eels) and marine birds. The expected change in

average temperatures and increased frequency of weather extremes may, for example, lead to more frequent and more severe flood events, which will in turn lead to increased costs for M ori as they attempt to survive, defend and mitigate. The predicted rise in sea levels will impact on coastal estuaries and wetlands, and M ori communities living close to the water will have to consider relocating their homes, marae and urup .

Increasingly, the variability observed in traditional climate indicators by M ori around the country (for example, the early flowering trees and increasingly variable and less predictable winds) is challenging the maintenance and use of these to reliably forecast weather and climate. A member of Te Wh nau- Apanui best summed the situation up by stating that it is not the MEK that has changed, but rather the environment. Overcoming these obstacles is regarded by M ori as a critical part of maintaining and building resilience to future weather and climate change. MEK is an important component of assessing and meeting the challenges of future local weather and climate change; the documentation and revival of MEK of local weather and climate in Aotearoa NZ should be encouraged.

Discussions and outcomes of the first and second M ori climate forums (see [http://www.niwascience.co.nz/ncc/M\\_ori/forum](http://www.niwascience.co.nz/ncc/M_ori/forum)) highlighted that M ori communities want to secure their own futures in adapting to climate change but that, in reality, little is known about adaptation options for climate change. NIWA is currently undertaking research funded by the Foundation for Research Science & Technology that will clarify the vulnerabilities of climate-sensitive M ori communities to climate variability and change, so as to identify the priorities for adaptive action, planning and research. The research will provide practical adaptation pathways and processes that can be utilised by M ori communities throughout Aotearoa NZ.

*Darren King (Ng ti Raukawa) and Apanui Skipper (Te Wh nau Apanui, Ng ti Tamater , Ng ti Paoa, Ng ti T korehe, Ng ti Raukawa ki te Au o Te Tonga, Ng ti Toa Rangatira, Te itanga-a-Mahaki) are members of Te K waha o Taihoro Nukurangi, NIWA's M ori Research & Development group. Darren is based at NIWA Auckland, where his work focuses on climate variability. Apanui is based at the NIWA Hamilton of ce.*

*To find out more about M ori Environmental Knowledge (MEK) of local weather and climate go to: [www.niwascience.co.nz/ncc/maori/knowledge](http://www.niwascience.co.nz/ncc/maori/knowledge).*

## Further reading:

King, D., A., A. Skipper, & W. Tawhai, 'M ori environmental knowledge of local weather and climate change' *International Journal of Climatic Change*.

King, D. & A. Skipper, 'Understanding local weather and climate using M ori Environmental Knowledge', *Water & Atmosphere* 14(2), 2006.

Name	Indicator	Expected outcome	Iwi / Region
<b>Matariki</b> (Pleiades)	The stars of Matariki appear wide apart. The stars of Matariki appear close together.	Warmer seasonal temperatures expected. Cooler seasonal temperatures expected.	Ngāi Tūhoe NE central North Island
<b>Pareārau</b> (Jupiter)	The shimmer of Pareārau is light and misty.	A wet month follows.	Te Whānau a Apanui E North Island
<b>Pīpiwharuroa</b> (Shining cuckoo)	The return of pipiwharuroa.	The beginning of warmer weather.	Ngāti Pare NE North Island
<b>Pōhutukawa</b>	Flowering starts on the upper branches and progresses downwards. Flowering starts on the lower branches and progresses upwards.	A cold and winter-like season will follow. A warm and pleasant season lies ahead.	Te Arawa N central North Island

This information has also been made into a set of educational posters (in Te Reo M ori & English), which are available for purchase via <http://www.niwascience.co.nz/pubs/posters/>.



# Committed to the community

PAUL BRUCE

I am a meteorologist (a MetService lead forecaster). My concern for the environment began in the 1970s, after the publication of the Club of Rome reports on Limits to Growth, and I became active in environmental issues as the chair of the Wellington Beech Forest Action Committee while training as a meteorologist. Over the last decade, I have spoken at numerous forums around Wellington on climate change, peak oil and transport issues. In 2004, as President of the Appropriate Technology and Living Association, I organised the first 'Peak Oil' forum in Wellington. I have submitted to the Greater Wellington Regional Council for a shift in funding towards public and active modes of transport and long-term energy sustainability, and as an active member of Cycle Aware Wellington, have organised cycle promotions and improved cycle facilities at my workplace. I joined the Green Party in the early 1990s and was appointed International Secretary. I was also a founding board member of the Development Resource Centre.

Wellington is a great place to be, and we do a lot right. But we can do better. We are unprepared for many changes that will happen in the coming decades. Our local economy is totally dependent on limited fossil fuels. Ad hoc developments are occurring, such as the Brooklyn Rise just down from where I live, with little regard to solar potential and long-term sustainability. Traffic, mostly private, is clogging up our city roads, pedestrians and cyclists are increasingly at risk from irate drivers, and our public transport is not running on time. We must reduce our dependency on fossil fuels for the sake of future generations and the rest of the biosphere; complacency is not an option, as the

most important of those fossil fuels – oil – is becoming scarce and expensive.

Looking back, we can see that strong environmental and social concern groups during the 1970s and 1980s achieved major breakthroughs on the protection of native forests and a nuclear-free Aotearoa New Zealand. The era also marked the end of the Vietnam War, and the anti-Springbok campaign which led to the breaking of Aotearoa NZ sporting links with South Africa during Apartheid. Following the first oil shock of 1979, major research was conducted into renewables, and governmental support was given to those seeking low impact, alternative lifestyles. However, as oil

**Wellington is a great place to be, and we do a lot right. But we can do better. We are unprepared for many changes that will happen in the coming decades. Our local economy is totally dependent on limited fossil fuels.**

prices dropped back down to single figures in the early 1980s, consumerism began to flourish once again.

Today, we have gone full circle, with young people showing leadership on issues of climate change, peak oil and consumerism. Some say it was Al Gore's 'An Inconvenient Truth', others see it stemming from George Bush's disastrous resource wars in the Middle East; we know leadership on these issues is certainly not coming from Government. The issues come out of the limits to growth, with drought and the dramatic lowering of water tables and the competition of bio-fuels bringing rising commodity prices, in particular food and fuels. As

commodity prices rise, those on the lowest incomes feel the pinch first.

Action is urgently needed at the international level to avoid rapid polarisation in the world between the haves and the have-nots. Now is the time to look at urban renewal. Community groups such as CRAGs – Carbon Reduction Action Groups – which form part of the global 'Relocalization Network' are crucially important for sharing innovative solutions on local markets, community gardens, renewable energies and efficiencies. The Relocalization Network supports 159 groups in 12 countries in their shift toward more local production of food, energy, and goods. In Sri Lanka, the Sarvodaya Shramadana movement helps some 15,000 villages develop under a 'no poverty, no affluence' model, based on addressing basic needs while also maintaining the importance of a clean environment, well-rounded education, and spiritual sustenance. Worldwide, the 379 'ecovillages' currently registered with the

Global Ecovillage Network connect residents socially while collectively lowering their ecological footprints, including local food co-ops, community-supported agriculture programmes, and carpooling.

In Aotearoa NZ, there is a CRAG group based in Eastbourne; in Motueka-Nelson you'll find the River Side Community; there is an Eco Neighbourhood in Waitakere City, Auckland; and in Wellington there are the Arlington Community Gardens, along with The Innermost Garden, a refugee and migrant women's multicultural sustainability project. Porirua's Trash Palace is an outstanding local example of sustainability and appropriate technology.

## RESOURCES FROM THE DEV-ZONE LIBRARY

HE RAUEMI MAI I TE KOHINGA A DEV-ZONE



**An inconvenient truth.** Director: *Davis Guggenheim, 2006.*

The former Vice President of the United States, Al Gore, presents a wake-up call that global warming is a real and present danger. This documentary emphasises that everyone can make changes and become part of the solution.

**A hard rain.** Director: *David Bradbury, 2007.*

This documentary debunks the myth that nuclear power is safe, green and cheap. It takes a closer look at the global nuclear industry and exposes the agendas behind the pro-nuclear push in Australia.

**Refugees of the blue planet.** Directors: *Helene Choquette and Jean-Philippe Duval, 2006.*

Each year, millions of people are forcibly displaced as their life-supporting environment is degraded. The Refugees of the blue planet sheds light on environmental refugees, who are constantly growing in number and often have no legal status, even though their right to a clean and sustainable environment has been violated.

## LINKS FROM THE KNOWLEDGE CENTRE

HE HONONGA MAI I TE PŪTAHI MĀTAURANGA

**The Arctic Council Indigenous Peoples' Secretariat** is a forum for indigenous Arctic peoples' organisations. A key area of concern for Arctic peoples is climate change; this website presents information on the impacts of climate change upon indigenous peoples in the Arctic region.  
[www.arcticpeoples.org/KeyIssues/ClimateChange/Start.html](http://www.arcticpeoples.org/KeyIssues/ClimateChange/Start.html)

**The Centre for Indigenous Environmental Resources (CIER)** is a national NGO established by a group of First Nation Chiefs from across Canada. CIER's programmes take action on climate change, build sustainable communities, protect lands and waters, and conserve biodiversity.  
[www.cier.ca/taking-action-on-climate-change/](http://www.cier.ca/taking-action-on-climate-change/)



# Take Action

## Take action with Greenpeace

**Take action with Greenpeace:** Environmental group Greenpeace New Zealand now focuses much of its work on the climate. 'The time for talking about the problem is over', says Greenpeace Climate Campaigner Susannah Bailey, 'we all know the deal and now we just have to get on with helping address it'.

Lawyers for Greenpeace have served legal notice on 20 major greenhouse gas-polluting Aotearoa New Zealand companies earlier this year. These companies now stand warned of possible litigation if they don't take action on climate change and won't be able to 'plead ignorance' if taken to court. Companies include Genesis Energy (the electricity generator), Solid Energy (coal miner), New Zealand Refining Company (oil refiner), Fulton Hogan (roading), Fonterra (dairy) and Landcorp (the country's biggest farming company).

Greenpeace has just released an updated version of its Clean Energy Guide, which ranks Aotearoa NZ's electricity companies on their contribution to climate change, both now and in the future. The Guide gives consumers the information they need to switch to a cleaner electricity provider (go to [www.cleanenergyguide.org](http://www.cleanenergyguide.org)). Greenpeace has also designed a guide to climate-friendly living, the Only Planet Guide. This gives handy hints on what you can do to help in the fight against climate change. It can be downloaded at: [www.greenpeace.org/new-zealand/news/the-only-planet-guide](http://www.greenpeace.org/new-zealand/news/the-only-planet-guide).

The  
Only  
Planet  
Guide

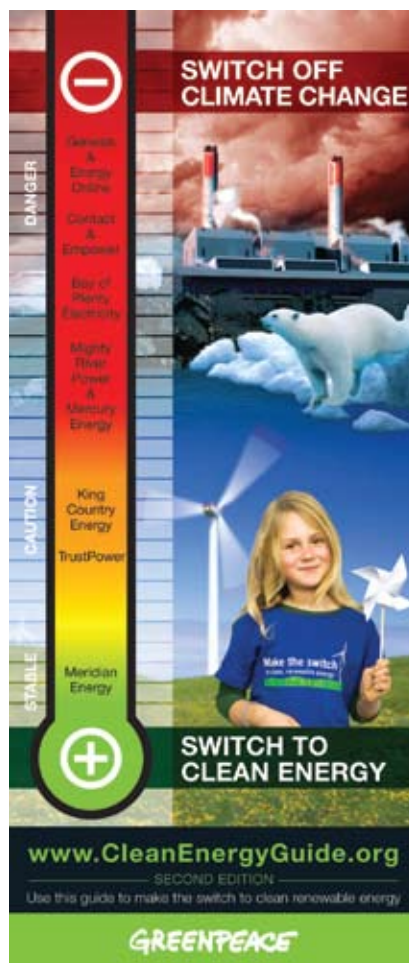


Your guide to climate friendly living

## The Indigenous Environmental Network (IEN)

was formed by grassroots indigenous peoples and individuals to address environmental and economic justice issues. IEN's education and organising campaign addresses the human rights impact that global warming, climate change and weather changes have on indigenous peoples, from the Global South to the North, to the small island states, to the Far East and to the West, and those in the Arctic Polar Regions.

[www.ienearth.org/climate\\_campaign.html](http://www.ienearth.org/climate_campaign.html)



## Other take action campaigns

**The International Day of Action on Climate Change** is scheduled for 8 December, 2007. For more information, go to [www.globalclimatecampaign.org](http://www.globalclimatecampaign.org).



## GLOBAL CLIMATE CAMPAIGN

**The Climate Defence Network** is a coalition of groups and individuals within Aotearoa NZ. They aim to promote and support positive policies and actions to address human-induced climate change; check them out at [www.climatedefence.org.nz](http://www.climatedefence.org.nz).

**42Collective** is a not-for-profit organisation based in Wellington, Aotearoa NZ, which works to encourage a shift towards a 'less-cost' lifestyle that enhances personal wellbeing, maximises resource and energy efficiency, as well as minimising harm to people and the environment. Keep an eye out for ways you can get involved at [www.42collective.org.nz](http://www.42collective.org.nz).

## News from the DRC

There have been lots of exciting things happening at the DRC. At Dev-Zone, over 500 poems have been submitted to create an anthology of poetry of global issues; it is shaping up to be quite a collection! The DevNet/NZAID Symposium on 'Civil Society and Governance: implications for aid' is also in the pipeline – visit [www.devnet.org.nz/symposia.htm](http://www.devnet.org.nz/symposia.htm) for more information. Dev-Zone has been busy recruiting two new information officers and editors for Just Change, with co-editors Bonnie Flaws off to Mexico and Spain, and Alia Levine on a year's parental leave.

Work on the re-branding of the DRC has begun, and a report was presented to the DRC board in September. The DRC has also presented a written submission on NZAID's Growth and Livelihood Policy, and looks forward to

viewing the final policy. As part of the centre's current funding agreement, the terms of reference for the NZAID review of the DRC are being finalised, which will inform the next NZAID/DRC funding agreement.

The Schools' programme has launched two great resources this term on 'Street Theatre and Human Rights' and 'Aid'. The Community team has been busy developing and implementing a youth sustainability film challenge, 'The Outlook for Someday: an International Volunteering Guide for young people with VSA', a Youth Take Action Guide with the YWCA, as well as encouraging young writers to look at global issues through the Just Focus project. The ICT team has been working on lots of interesting things, including publications and the new GEC website.



