

Water of Life

Science, Faith and the Climate Crisis

We humans live in a dysfunctional relationship with our complex and beautiful planet. Scientists have been warning of impending climate disaster for several decades; but the industrialists and economists often shout louder and carry more weight. Education should be the obvious antidote but dissenting teachers' and professors' voices are sometimes muted or re-tuned to performance and so-called progress. Faith communities can feel a strong obligation to care for the Earth, but worldly pressures tend to distract and divide. Yet, within each of these seemingly disparate disciplines, there are people who know that things must change significantly from the status quo that is severely damaging planetary health. A group of people from these diverse areas came together in a conference last year: 'Moana: Water of Life'



<https://www.lincoln.ac.uk/home/media/responsive2017/collegeofscience/schoolofgeography/research/Moana,Climate,Change,Event,Brochure.pdf>

and voices from each discipline were collated in the resulting book: 'Science, Faith and the Climate Crisis'

<https://books.emeraldinsight.com/page/detail/Science-Faith-and-the-Climate-CrisisScience,-Faith-and-the-Climate-Crisis/?k=9781839829871>

Here those voices reunite in simple form with a simple message. Despite current pressing concerns with the global pandemic, the climate crisis is not going to go away any time soon, but neither is our determination to work together to address it.

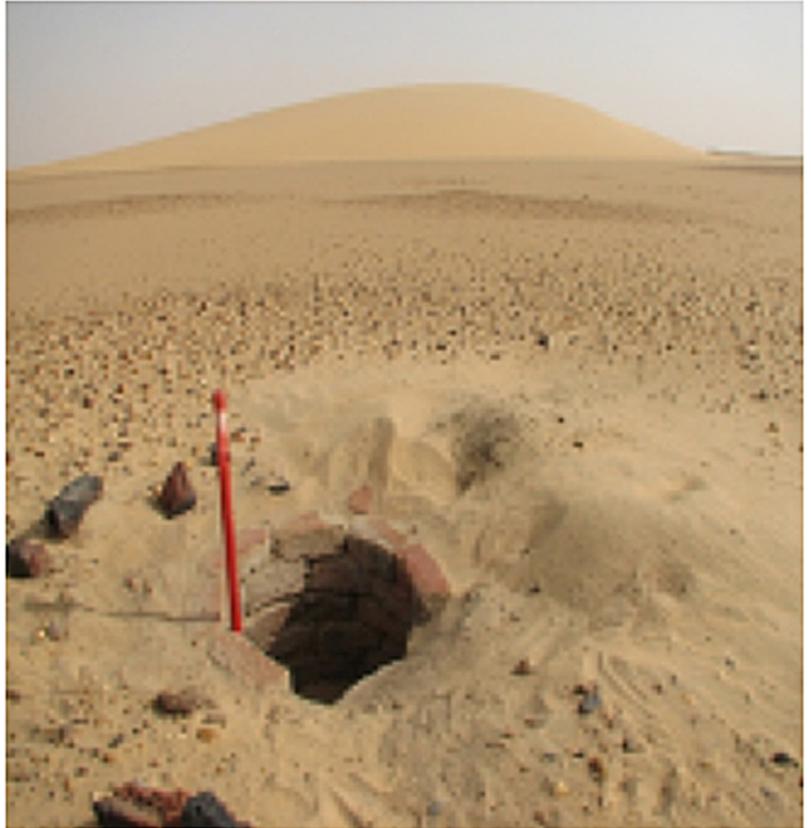
The Rivers of Humankind

Mark G. Macklin & John Lewin

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Most ancient civilisations (and now many modern ones) have depended on the water from rivers that flow through their lands. Irrigation dates from about 6000 BCE in Mesopotamia (now Iraq), but also from earliest settlement times in North and South America, Africa, Asia and Europe. Many were in dry climates with grasslands and reliant there on the water that their rivers provided for plant and animal domestication and grain cultivation. To suit their ways of life, complex but nevertheless environmentally-dependent societies greatly modified their physical surroundings through deforestation, pastoralism and cultivation - with resulting soil erosion and accelerated river sedimentation. Change also came to natural systems through the building of settlements and cities, the development of industries and communications, and the spread of pollutants and diseases - many by water. Rivers themselves have been engineered to improve transport and to protect against erosion and flooding.

But civilisations have risen and fallen, many because of what might seem relatively short term (but to the local inhabitants sometimes catastrophic) climate, river flow and other self-inflicted factors affecting water resources and quality. These disrupted peoples' adjustments to, and reliance on, 'normal' conditions. We know a great deal about older civilisations and their environmental states, adaptations and challenges. The historical survival consequences for hard times unpreparedness should now underscore the very urgent need to adapt to the unfolding climate and environmental crises in what are now even more changeable times. Our ancestors had to adapt - or perish - and so must we. As well as trying to remedy today's great challenge of global heating as much as we can, we have to live with it, and to plan ahead for future decades. Many changes are already visible and are irreversible, and it will be on the world's most densely populated floodplains where this existential crisis will be played out.



Nile Valley near Dongola, northern Sudan, showing former river channel blocked by a dune with a brick-lined well in the foreground. Both ran dry as a consequence of regional drought.

Citizen Social Science & Education for More Integrative and Effective Climate Action: A Science-Policy Perspective

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Governments have struggled to limit global temperatures below the 2°C Paris target with existing climate change policy approaches. This is because conventional climate policies have been predominantly (inter)nationally top-down, which has limited local citizen agency in driving policy change and influencing citizen behaviour. We propose elevating the idea of *Citizen Social Science (CSS)* to a new level across society as an advanced collaborative educational approach of accelerating climate action and policies that moves beyond conventional citizen science and participatory approaches. Moving beyond the traditional science-policy model of the democratization of science is essential in enabling more inclusive climate policy change. There are a number of ways in how CSS as a form of *Education for Sustainable Development (ESD)* can potentially transform citizen behaviour and enable citizens to become key agents in driving climate action and policy change. These include facilitating informed decision-making; persuading those in positions of policy authority that change is needed; greater climate awareness; wider outreach through intergenerational learning; increased capacity and knowledge of teachers; reducing misconceptions of the media and climate scepticism; and co-producing climate knowledge and action.

However, there are barriers that could impede this too. These include a need to reframe climate action in ways that it becomes less overwhelming to the individual, which often erodes motivation to act; conflicts of interests between different stakeholders in making appropriate climate decisions; recognizing ‘a one size fits all’ approach to tackling climate change will not work - so we need to be mindful of how far CSS can extend in a ‘rule of experts’ context; how uneven power relationships can constrain citizen-centred action, in particular ostracizing citizens from the formal political governance of climate policy decisions; and differences between countries where different political systems can limit citizen action.

Arguably, our current political systems are not yet fully equipped to deal with greater citizen involvement in climate action, but CSS through ESD could go some way in giving citizens greater ownership of their own actions beyond what governments are currently doing. Citizens can become key agents of action, research and policy change just like the recent climate School for Strikes movement and the Extinction Rebellion protests have shown. In the post- climate emergency and COVID-19 era, governments are now standing up and listening more. For example, there have been calls for the need for increased community participation in pandemic responses and policies to deal with the COVID-19 pandemic in much the same vein as we have been seeing for the climate emergency. We as citizens need to capitalize on this opportunity and mood for change by ramping up CSS through ESD as one pathway to secure more equitable and just climate transformations as a distinct form of climate governance that works alongside other government policies.

Reaching 'Net Zero': An Energy Perspective

Mike Colechin (*Founder of Cultivate*)

With a shout and a chant the 'Moana - Water of Life' Conference opened by celebrating Oceania - island communities living in harmony with the waters that connect them, feed them, provide them with cultural identity... and now threaten to engulf them as the result of the actions of people living thousands of miles away. We then heard a series of compelling personal narratives accentuating the need to reverse global warming.

I regularly paddle a wooden canoe on the rivers near my home. This experience hardly compares to tackling Pacific Ocean waves in sea-going canoes, and I only have a vague



sense of the connection the people of Oceania feel to one another and to the seas on which they travel. And yet, I believe that addressing the challenge of climate change, becoming 'Net Zero' in our greenhouse gas emissions, will require similar levels of ambition and connection to one another.

It is hard not to be drawn into a technological framing of this problem - if only we built enough wind turbines and solar panels and deployed other low carbon technologies, surely we could create an abundance of clean energy. However, the most effective technical solutions cannot necessarily be afforded, nor will they always deliver the jobs or social equity we also desire.

This calls for us to frame the question in a different way – how can we change the whole system to make our use of energy more sustainable? How can we create a fundamental reduction in our demand for energy, through the daily decisions we each make...?

The whole of society needs to be engaged in thinking that energy is precious. For too long we have considered it an abundant resource. Energy is all around us, but the methods we currently use to harness it have a penalty which is being borne by others, often many thousands of miles away in communities very different from our own. Ultimately, the consequences will be borne by all of us.

Reading the Bible as Waters Rise: Ecological Interpretation of Scripture

Emily Colgan (*Trinity Theological College, Aotearoa, New Zealand*)

For over fifty years, scientific leaders have warned us that climate change is causing irrevocable damage to the planet. Yet despite climate change being among the most critical issues faced by the Earth community, questions remain as to whether the political will exists to address the situation quickly and effectively. Scientific fact alone is not enough to counter the cultural pathology that enables humanity to cause such damage without thought of long-term consequence. These warnings must find coherence with the religious and philosophical foundations that underlie the way human communities perceive themselves and their relationship to the environment.

The most influential biblical narrative outlining this relationship is found in Genesis 1. This account details God's creation of the world in seven days, with the climactic appearance of human beings on day six. Humans are made in the image of God and given the mandate to dominate, fill, and subdue the Earth (1:26-28). From an ecological perspective, the relationship between humanity and Earth here is characterised by violence and disconnection. Are there other biblical texts that might contribute to an alternative narrative, which tries to make sense of our place and purpose in the world in a different way?

In the following chapter of Genesis, we learn there is no vegetation on Earth because there is no one to 'serve' adamah (ground/earth) and nurture her (Gen 2:5). So, God takes soil from adamah and creates an adam, a human being. God then gives the human the task of completing what is missing at the beginning of the story: God 'took the adam and put him in the garden of Eden to serve and preserve it' (2:15). The most fundamental human work is to 'serve and preserve' adamah. Earth then helps God create the animals and birds (2:19), and there is kinship between these creatures and the human being. Earth is their ancestor and God their Creator. Humanity is not separate from God or Earth – there is a continuity of life.

The image of relationship here does not provide solutions to the complex issues specific to the climate crisis. This vision provides faith communities with a foundation for reconceiving the relationship between God, Earth and humanity, from which we might address the multiplicity of issues related to the ecological crisis.



Window: Canterbury Cathedral

**“Moana: ‘Oku mafeia he ‘Otua ‘a e me‘a kotoa pe
(Moana: Nothing is impossible with God”
(Luke 18:27)**

**Reflections of a Tongan early career researcher on God
and climate change**

Peni Hausia Havea (*Tungi Colonnade, Level 1, Kolofou, Nuku‘alofa, Tongatapu, Tonga*)

It is argued that religious or spiritual motivations for environmentally oriented behaviour could effectively mobilize mainstream society and contribute significantly to adapting to climate change. However, a global referential documentation does not exist to highlight specific instances where bridging religion and climate change science has been successful or has faltered.

Based on my experiences in Tonga in the Pacific as a training Pastor and my understanding of Moana, I developed a model name “Nothing is impossible with God” to guide the spiritual adaptation for Moana not only in Tonga but also the other Pacific Islanders as well as other faith. I took this verse from the Bible in the sense that I found that by using Jesus Christ as a guide, he can reverse the impacts of climate change in people lives. In our faith because Jesus is the son of our Christian God in the form of human being, he is the only one who can reverse the impacts of climate change.

In the Pacific, such as Tonga, using this worldview orientation that is premised on accepting the Bible as an authoritative document that complements climate scientific and social perspective is wholly legitimate especially in a nation where 99.9 percent are Christian including their Head of State, the King. This paradigm may differ significantly from other religions (e.g., non-Christian) and worldview persuasions.



Earth, Air, Fire and Ice:

Exploring links between human-induced global warming, polar ice melt & local scale extreme weather

Edward Hanna (*School of Geography and Lincoln Centre for Water and Planetary Health, University of Lincoln, UK*)

& **Richard J. Hall** (*School of Geographical Sciences, University of Bristol, UK*)

Human activity has dramatically disturbed Earth's climate system and led to increasingly extreme weather. Global warming is not equal everywhere, being greatest at high latitudes, causing rapid melting of polar ice cover, and these inequities may have influenced some surprising changes in weather extremes over the UK and other densely populated mid-latitude regions of the Northern Hemisphere in the last two decades. Another major effect is global sea level which



could quite possibly rise to more than a metre above recent levels by the end of this century and displace many millions of people from low-lying coastal regions. We are currently at a crucial point in our attempts to combat our damaging effects on climate change; what we have achieved so far with remediation is really only the 'tip of the iceberg' compared with what we need to do and soon! To derive adequate solutions to the climate crisis, we must make major changes to the ways in which we all live individually, as well as larger structural changes to society, and we as climate scientists need to improve our engagement with diverse stakeholders including religious communities. The Antarctic ozone crisis of the 1980s was solved fairly rapidly, so why can't we do likewise with dangerous climate change? We have the technology needed but the real challenge is garnering the collective interest and willpower to act together adequately. We must encourage ever more rapid increases in renewable energy usage in order to help 'decarbonise' the global economy. In addition we strongly advocate the increased working of climate scientists with religious leaders to altruistically engage potentially hundreds of millions of people at this time as a viable alternative to traditional political lobbying routes. Since mainstream religious organisations often control sizeable financial assets, there is also an opportunity to accelerate withdrawal of support from fossil fuel industries and help promote 'greener' business opportunities.

Education to Adapt and Survive

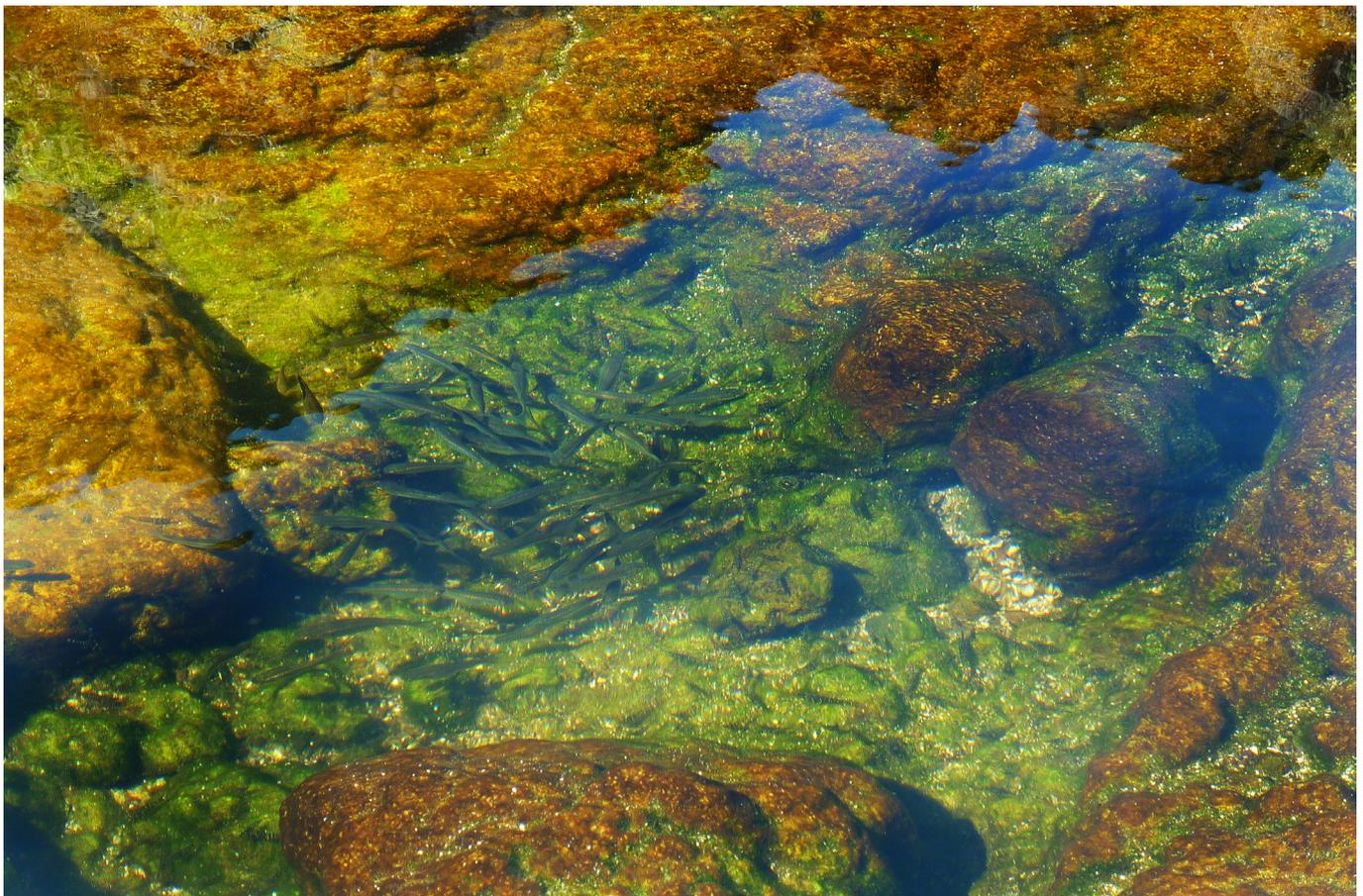
Sarah Hemstock (*Adjunct Fellow of the University of the South Pacific & Executive Member of the Pacific Regional Federation of Resilience Professionals*)

We are living in the Anthropocene. The mess produced by humans is now embedded in our planet's geology, we are facing the collapse of various ecosystems, and environmental change is our major contemporary challenge. Pollution of our atmosphere via our use of fossil fuels is the major contributor to this environmental change. An interesting animation of our planet's major cumulative pollutants can be found here:

<https://www.youtube.com/watch?v=jx85qK1ztAc>

Added to that, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services reported in 2019 that: Nature's Dangerous Decline is 'Unprecedented'... and that Species Extinction Rates are 'Accelerating'.

<https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>



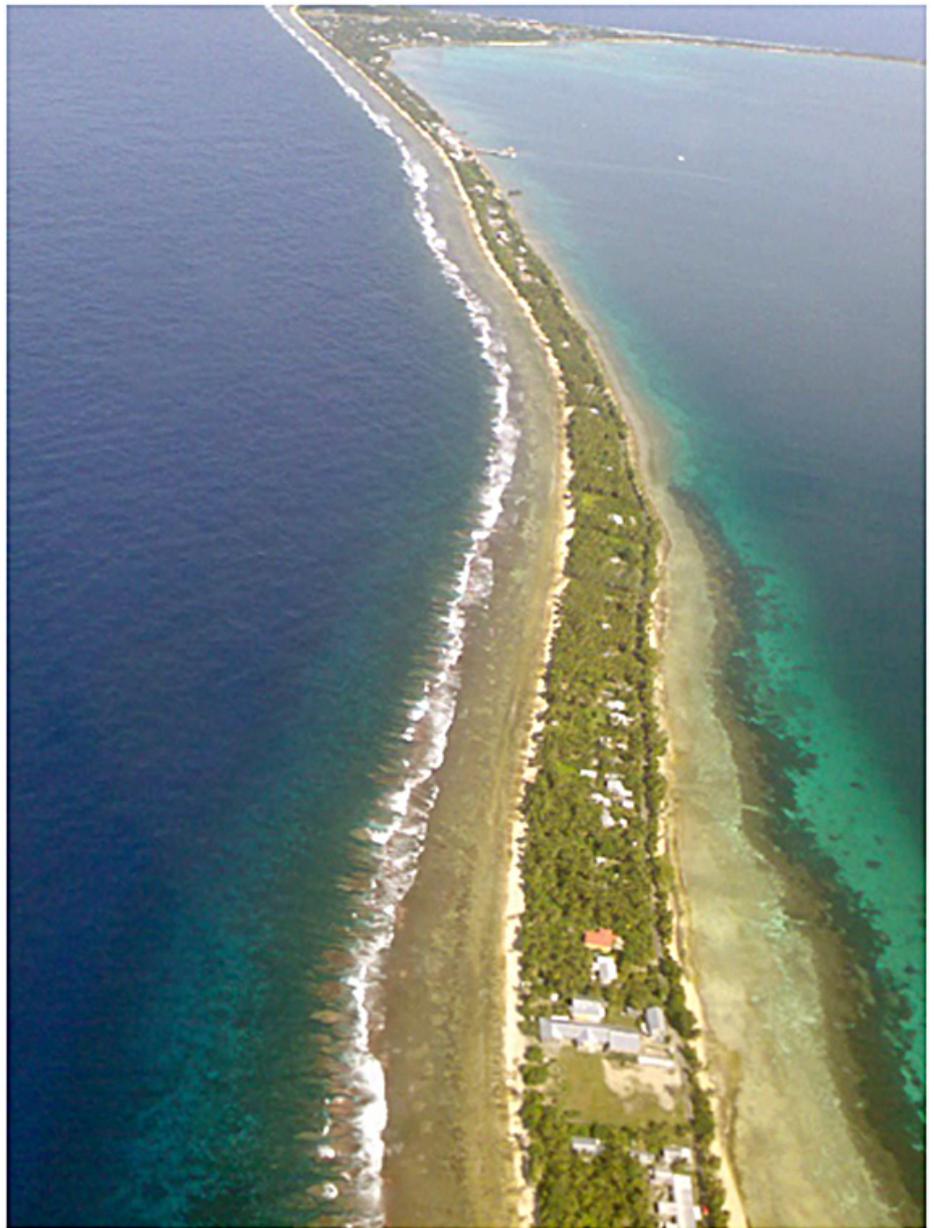
We need to adapt to survive. Education at all levels (primary, secondary and tertiary) is key in order to help us comprehend the issues, causes and impacts of environmental and climate change, and indeed, in order to help society at large adapt and survive. Education's key role in addressing climate change and other environmental issues was recognised almost three decades ago at the United Nations Conference on Environment and Development (UNCED), also known as the Rio de Janeiro Earth Summit in 1992. The United Nations Framework

Convention on Climate Change (UNFCCC) was also opened at this Earth Summit. Since then we have had the UNESCO decade of education for sustainable development and other initiatives. These have had seemingly little impact in countries like the UK, a major cumulative contributor to climate change, where the National Curriculum for Geography at all key stages does not include climate change or environmental degradation directly.

In the Pacific Small Island Developing States (PSIDS) (for example, Cook Islands, the Federated States of Micronesia (FSM), Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea (PNG), the Republic of the Marshall Islands (RMI), Samoa, Solomon Islands, Timor Leste (East Timor), Tonga, Tuvalu, and Vanuatu), there are limited resources for delivery of education and training.

These countries are on the “frontline” of climate and environmental change impacts and are also at the forefront of developments in climate change education and community action on disaster risk management. Current Pacific regional and national policy strongly supports climate change education.

What are the climate change educational developments in the PSIDS? The European Union Pacific Technical and Vocational Educational and Training in Sustainable Energy (SE) and Climate Change Adaptation (CCA) project commenced with a needs analysis for each country which revealed that formal qualifications were required for “genuine” capacity building. This was in response to previous aid projects providing training, but not qualifications. For example, when Cyclone Pam hit Vanuatu in 2015, relief responses were delayed because, although community members had been trained on



post disaster assessment, relief agencies sent in their own assessors as the community members were not deemed “qualified” to make the assessments. National stakeholders were therefore keen to ensure opportunities for learning via formal qualifications were available to all people

affected by climate change, meaning that educational opportunities should be applicable across the board, from grassroots community members to government and private sector managers. This led to qualifications being constructed around a “competency” and “skill-set” approach. This means that people can pick what competencies they need to “up-skill” in order to improve their own capacity – a menu of competencies and skill sets are available within the qualifications. Completing a range of units will build into a full qualification. Countries can deliver different aspects of the qualifications according to their own needs (e.g. grassroots actions such as clean drinking water provision, vulnerability assessment and post disaster recovery; to local government management issues such as cost benefit analysis of project activities and project management). The qualifications are delivered in local secondary schools and colleges and by the University of the South Pacific and can be built upon by completing skill sets at more than one educational provider.

This approach led to three global educational firsts, with support from all 15 participating countries:

1. Regional, rather than national agreement on government sanctioned qualifications – Regional Certificates 1-4 in Sustainable Energy and Regional Certificates 1-4 in Resilience.

2. A new vocational education subject area: “Resilience”. Qualification strands include: agriculture, coastal management, energy and infrastructure, fisheries, forestry, health, tourism and water resources.

3. The recognition and professionalisation of “Resilience” as an employment sector - via the creation of an industry association: the Pacific Regional Federation of Resilience Professionals (PRFRP).

But most importantly, the educational initiatives have had a demonstrable impact on people’s resilience to climate and environmental change impacts. When Cyclone Harold hit Vanuatu in 2020, and Cyclone Gita hit Tonga in 2018, communities were better equipped to prepare and recover from these natural hazards.

It has also allowed communities in Tuvalu to better plan their fresh water provision – showing that islander communities are resilient and are able to adapt and survive...



Lost in Translation

Sally Myers (*Visiting Scholar at the Woolf Institute, Cambridge*)

Religious people of all traditions around the world are becoming more and more proactive in tackling the climate crisis, often joining together to do so. This is a cause for a twofold celebration. The Christian vocation to care for creation ought to be crystal clear, and indeed, it is to most. Justin Welby, the Archbishop of Canterbury certainly thinks so: “Reducing the causes of climate change is essential to the life of faith. It is a way to love our neighbour and to steward the gift of creation.”

<https://www.churchofengland.org/about/policy-and-thinking/our-views/environment-and-climate-change>



However, there is a small but seemingly sincere group that cites scripture to propose otherwise; arguing that Christ is in opposition to the earth. Part of the difficulty at least is easily resolved. It is due to a lack of clarity around translation. Put simply, the word world is confused with the word earth. We tend to use the words interchangeably, but they are distinct, have discrete conceptual meanings, and when it comes to the bible they are used very differently.

The word world refers primarily to human existence and appears in the New Testament as two Greek words 1) kosmos – as in cosmetic i.e. ordered on the surface, and cosmopolitan i.e. belonging to the political organisation of the world and 2) eon – as in age of a certain set of prevailing circumstances

It doesn't refer to the physical land, it refers to the social world of people. The word world in English is a derivation from three different languages and means literally 'the old man', as in the passing generation of status quo. This is important theologically because whenever it is used in the New Testament, for example, when Jesus says 'I am in but not of this world' or 'I am the light of the world' it is referring to the old world order. Critically, God's judgement then is of this world order and not the earth.

In contrast, the earth refers to the ground. It comes from the Greek Ge meaning – soil – dirt – land - the living planet.

This earth was lovingly created by God and we received a divine order to tend it in Genesis 2.15. The earth then, is God's own handiwork, entrusted to humans as abode not chattel of the world.

Science, Faith and the Climate Crisis – one year on

Sally Myers (*Visiting Scholar at the Woolf Institute, Cambridge*)

This short series of blogs is an attempt to give a taste of the Moana: Water of Life conference held in 2019 and the subsequent book. The diversity of voices at the original event was tremendous; scientists, educators, theologians, church leaders, activists and students from the UK, Pacific Islands and USA all came together to speak and to be heard. Physical, practical, political and spiritual perspectives on the climate crisis were shared alongside the experiences of those already living with the consequences of global warming.

Any attempt to reduce the rich energy generated to a few short sentences would not honour the project or the people. What we offer instead are some glimpses of communality.

Everyone agreed that however different we are, we are all connected, to the earth and to one another. This stretched across our different locations and disciplines and an affinity was discovered that ran deeper than our shared concern for the planet. Our common humanity was further expressed in the recognition that tackling climate change effectively requires much more than some ‘top down’ initiatives, vital though they are. An approach is needed that touches how people actually live their lives and what they value, both their external behaviour and internal belief. Our individual roles in this are crucial. Science provides the means to understand what is happening. Education provides the key to changing minds and actions. Innovation and practical responses provide solutions. Faith provides the ‘why’ for millions of people around the world. Working together we not only begin to break down the barriers to change, we learn from one another how to change better and quicker. The collaboration has had important immediate impact in influencing policy and direction in all of the areas represented. However, the creation of a template for collaboration across these disciplines may lead to even greater outcomes in the future.

