

# Beyond Insular Education Policy: Learning to live together in the face of climate change in the Pacific

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## Abstract

Ideas of living together are not new in the Pacific. Many islands have historical relationships and familial connections that foster an exchange of ideas and resources among neighbors. Today, climate change and adaptation are issues of pressing concern, forcing those of us who live in the Pacific to expand our relationships and learn to live together in a new way.

Communities in the region are already experiencing the impacts of climate change. Implications on the environment, economy, and socio-cultural dynamics of the Pacific region call for new, broader forms of collaboration among traditional and government leaders within and among island communities. Leaders are looking to reinvent how and what students learn in order to prepare a new generation of climate-aware citizens. We are called to reach beyond our own communities to learn from others, developing policy and institutional frameworks that promote regional collaboration.

This paper explores ways education in the Pacific can move forward in light of climate change. Work is currently underway within countries and among partnering nations to learn from successes and failures. These initiatives, while nascent, build on those bonds and stand as examples for how communities are reimagining climate education from a regional perspective.

## INTRODUCTION

The islands of the Pacific have historically been thought of as small and isolated by the rest of the world. However, the people of the Pacific would tell you otherwise because for many of them, the sea is just as much of their home as the land. Much like land-locked countries that have relied heavily on trade and transport with neighboring countries via roads and vehicles, island nations are also highly interconnected – although their modicum for connectivity is the ocean. Thus, Pacific Islanders view the ocean not as a barrier, but an avenue, and for hundreds of years, the livelihood of the people has depended on the ecological balance between land and water. Sadly, this balance has changed as globalization coupled with the impacts of climate change – sea level rise, ocean acidification, changes in rainfall pattern, and storms – are steadily shifting the region towards a level that is unsustainable.

According to a publication from the United Nations Framework Convention on Climate Change Secretariat, the average small island developing state emits only 1.5% of the greenhouse gas that industrial countries do (2005). The notion that ‘those who contribute the least to the problem suffer the most’ is a commonly shared feeling amongst Pacific island nations, many of which are in the process of developing adaptation, mitigation, and/or evacuation strategies. Education plays an important role in these strategies as subsequent generations of islanders will bear the brunt of these climate effects. However, education in isolation, from policy to pedagogy, is not enough to create generative change. Rather, the strength of these nations lies in their interconnectedness, and it is through shared experiences that the people of the Pacific will learn to live together and move forward with a collective voice and purpose.

## BACKGROUND ON THE PACIFIC REGION

At 60.1 million square miles (155.6 million square km), the Pacific Ocean is the world’s largest ocean, covering approximately one-third of the Earth’s surface and almost equal to the total land area on the Earth (Central Intelligence Agency, 2011; Encyclopedia Britannica, 2012). Landmass in the four regions of Oceania—Melanesia, Micronesia, Polynesia, and Australasia—totals about 3.3 million square miles (8.5 million square km). Islands in this region are home to about 37.5 million people as of 2011 (SPC, 2011; DBEDT, 2011; UN Statistics Division, 2012). While the most populated locations include Australia, Papua New Guinea, and New Zealand, the most population dense locations include Nauru (587.1 people/square km), Tuvalu (428.7 people/square km), and Marshall Islands (406.8 people/square km). And with 135,663 km of coastline, it is no surprise that subsistence and commercial fisheries, along with tourism and agriculture, are major contributors to Pacific Island economies (CIA World Factbook, 2011; SPC Statistics for Development, 2011).

The environment of the Pacific region is diverse, both geomorphologically and biologically. The Pacific includes low coral atolls, high volcanic islands, and continental islands. As a result, there are a wide variety of landscapes—like forested areas in Samoa; mangrove forests in Micronesia; deserts in Australia; lagoons in the Marshall Islands; and high mountains in Hawaii and New

Zealand. Coral reefs throughout the region are abundant and productive—providing a wealth of marine life and protection. This variety, combined with the ecological isolation of many of these islands, means a high proportion of species are endemic (found only on one island or in one archipelago), making island species more susceptible to disruption by biological invasions and species loss. Further, the small size of most of these islands means terrestrial resources are generally limited (Shea et al., 2001)

### **Climate and Impacts of Climate Change in the Pacific Region**

Most Pacific islands experience distinct seasonal rainfall variations with little variation in temperature, and at times extreme events: tropical cyclones, storm surges, drought, and heavy rainfall. The major pattern of climate variability in the Pacific region is the El Niño-Southern Oscillation (ENSO), a two-to-seven-year fluctuation between warming (El Niño) and cooling (La Niña) and the fluctuation of a global-scale tropical and sub-tropical pressure pattern called the Southern Oscillation. Together, ENSO causes shifts in the ITCZ, SPCZ, and WPM, which in turn have significant influence on rainfall, sea level and the risk of tropical cyclones in the region (Australian Bureau of Meteorology, 2011).

An overall increase in global temperature is likely to cause a continued rise in global mean sea level and changes to precipitation. In fact, scientists have reported consistent warming trends in all small-island regions over the 1901 to 2004 period with accelerated rates of warming in the South Pacific (0.3 - 0.5°C in annual temperatures every 10 years) starting from the 1970s. This has been accompanied by an average rate of sea level rise in the Pacific of about 1.6 mm per year between 1950 and 2000 (IPCC, 2007). Drought, flooding, and marine inundation caused by these changes, coupled with limited resources and socio-economic conditions, make Pacific islands highly vulnerable and likely to incur several detrimental impacts (Fletcher & Richmond, 2010; IPCC, 2007), including the following:

**Food Security.** Currently, approximately one sixth of the world's population is considered to be living in hunger. In a report from Oxfam, up to 50 million *more* people around the world will be forced into hunger as a consequence of climate change (Oxfam Australia, 2009). Climate effects such as sea level rise, increased flooding in certain areas, and increased droughts in others, are already affecting crop yields around the world. This can be particularly taxing on those who rely heavily on subsistence farming to feed their families. Furthermore, these trends will have a direct effect on global food prices in the future; a big concern for the Pacific islands where the vast majority of all food products are imported. Currently in American Samoa, for example, the Department of Agriculture claims that over 95% of all food supplies are imported from overseas (American Samoa Government, 2012). Similarly, in 2008, the proportion of food expenditure accounted for by imported food for the Republic of Palau was over 80% (Pacific Islands Forum Secretariat, 2011).

**Water Resources.** Because of limited size, water resources on small islands are very vulnerable to changes in climate, especially changes in rainfall. Less rainfall leads to less water that can be harvested from the water catchment systems and wells from which people draw fresh water for drinking, cooking, and washing (IPCC, 2007). For example, climate models suggest that a 10% reduction in average rainfall by 2050 is likely to correspond to a 20% reduction in the size of the freshwater lens (the source of well water) on Tarawa Atoll, Kiribati. This does not

take into account the impact of sea level rise, which is likely to reduce Tarawa's freshwater lens by an additional 10% (World Bank, 2000).

**Displacement.** Another major challenge for the people of the Pacific islands is the issue of displacement. As sea levels rise, coastlines will recede and the amount of habitable land will gradually decrease. Not surprisingly, the Pacific region, with half of its population living less than 1.5 km from the coast, is highly susceptible to population displacement (Malkin, 2009). This risk is much greater for low-lying atoll islands where the highest point of elevation is often less than a couple of meters above sea level. In fact, according to Oxfam, more than 75 million people living in the Pacific will be forced to relocate their homes by 2050 due to rising sea levels. One country at the forefront of this issue is Tuvalu - a country consisting of 26 square km of land spread across nine atoll islands (CIA World Factbook, 2012). For the 10,000 inhabitants of Tuvalu, the future of their islands is bleak. Former Tuvaluan Prime Minister, Saufatu Sopoanga, put it best when he addressed the UN General Assembly in September of 2003:

*"We live in constant fear of the adverse impacts of climate change. For a coral atoll nation, sea level rise and more severe weather events loom as a growing threat to our entire population. The threat is real and serious, and is of no difference to a slow and insidious form of terrorism against us."*

These words echo the stark sentiment of Pacific leaders across the Pacific, many of whom foresee a dramatic shift in the way of life for their current and future generations.

### **Importance of Education in Climate Adaptation**

Today, much of the rhetoric surrounding climate change in the Pacific region focuses on themes such as: 'adaptation', 'mitigation', 'resiliency', and 'preparedness'. The regional summits and forums surrounding these issues stress the importance of preserving the Earth for the next generation, yet little attention is given to environmental and climate education. This is a clear mismatch between rhetoric and implementation. Therefore, when devising adaptation strategies, decision makers in the Pacific need to keep in mind that the most effective strategies are the comprehensive ones – those that are interwoven with other existing sectoral policies (Mimura, 1999). Policies and frameworks that offer solely short term solutions do a disservice to the next generation of Pacific Islanders who will inevitably inherit the problems of the present day. Thus it is imperative that future leaders of the Pacific attain the proper knowledge and tools to better address the climate-related problems of tomorrow. To do this, they must first develop a firm understanding of their local, regional, and global climate situation at an early age. Education is one of the most important and worthwhile long-term investments in any field; climate education is no different. Dr. Eugene Cordero puts it well by declaring that: "an educated citizenry is required to make wise decisions regarding policies and practices aimed at reducing greenhouse gas emissions and the human impact on the Earth's resources" (2007).

## **CURRENT LANDSCAPE OF PACIFIC ISLAND POLICIES SURROUNDING CLIMATE ADAPTATION AND EDUCATION**

These days, Pacific islanders live in a tenuous space where daily life is influenced by both traditional ways of interacting with the environment and the trappings of western society. In many ways, this space is created and reinforced by policy frameworks that do not value cooperation for the sake of mutual aid, but rather, place emphasis on trade and financial stability.

This section analyzes policy action on climate change mitigation and adaptation from several perspectives. First, initiatives taken to combat climate change generally are examined both globally and regionally. In short, global action against climate change has been exceptionally difficult and, thus, little has been achieved. On a regional level, although a consensus has been far easier to come by, the small size of Pacific economies and their relative lack of influence have meant that any action in the region have been ineffective in stemming the tide of climate change.

Next, this section examines policy action specifically on education systems and climate change. Here we see a slightly more nuanced situation. Regional action in the Pacific on this issue has been swift, comprehensive and complex. The various regional forums have busily constructed frameworks over the last two decades which they hope can be used to implement climate change education across the region. However, at a national policy level these regional initiatives do not appear to have flowed through effectively.

### **Major Global Climate Change Policy Action**

From a legal and policy perspective, there is a lack of international consensus and cooperation on a path forward when it comes to climate change adaptation and mitigation. This is true across all sectors, not simply in term of education policy. There have been widely varying views in the last two decades, first about whether climate change actually exists and accelerated by man-made activity, and later about what should be done about it and who is responsible for taking action. This means that in reality, there have only been two significant international agreements relating to climate change mitigation and adaptation: The United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol).

The UNFCCC was devised at the United Nations Conference on Environment and Development (UNCED), informally known as the ‘Earth Summit’, in Rio de Janeiro in 1992 (United Nations, 1992). The UNFCCC was a true ‘framework convention’ in that it contained no binding obligations whatsoever but simply provided an international structure for the passing of binding protocols to the convention in the future. This convention has been ratified by every member of the United Nations, except for South Sudan, and also by Niue, and Cook Islands and the European Union.

The Kyoto Protocol, adopted in 1997 and put into effect in 2005, was ratified by 191 states and was intended to impose binding obligations on developed countries to reduce the levels of greenhouse gases they emitted. As it well known, the US refused to ratify the protocol and

Canada renounced it in 2011. Furthermore, other industrialized states have failed to comply with the treaty even though they signed and ratified it.

Since Kyoto, the UN has convened four conventions on climate change. At the most recent UN Framework Convention on Climate Change in Durban in November 2011, international leaders established a legally binding agreement for all countries, including the US, to address climate change. In addition to establishing a US\$100 billion Green Fund to support adaptation in poorer countries, this agreement forced countries to recognize that their current policies are inadequate and sets a deadline for change by 2015 (UNFCCC, 2011). In doing so, this convention, like preceding conventions, was a show of recognition that climate change needs to be addressed at an international level.

However, international conventions do not fully address the issue, especially if larger countries do not comply and smaller countries can easily be ignored. When a single, small nation speaks out—like when the Republic of Palau announced in 2011 that it would seek an advisory opinion from the International Court of Justice (ICJ) about whether there was an international customary law duty on states to prevent them emitting greenhouse gases—it may gain the world’s attention, but little real action is taken to address their need (UN News Centre, 2011). Climate change will still happen, Pacific islands will still be impacted sooner than other locations, and education still has an important place plans for climate adaptation.

## **Climate Change and Education**

**Global Agreements.** Given how little legal and policy action there has been on general climate change mitigation and adaptation around the world, it is not surprising had there has been very little agreed on regarding climate change and education. These two issues have generally been slotted in under other broad Millennium Development Goals (MDGs) in order for them to be brought to the global fore. Specifically: MDG #7, which deals with environmental sustainability; and MDG #2, which deals with providing Education for All (EFA).

It is under the EFA goal that the most progress has been made. Out of this goal has grown the concept of Education for Sustainable Development (ESD), and still further within ESD is the topic of Climate Change Education (CCE). EFA is one of the major agenda items for UNESCO and ESD and CCE form part of UNESCO’s program globally.

One particular region that has shown significant progress in adopting the ESD ideas from MDG #2 is Southeast Asia. Specifically, in October of 2000, the member states of The Association of Southeast Asian Nations (ASEAN) developed the ASEAN Environmental Education Action Plan (AEEAP). This action plan provided a “collaborative framework for the development and implementation of environmental education (EE) activities” and within this framework, 144 action plans (36 for each of four major target areas) were laid out (“Public Awareness and Environmental Education”, n.d.). In September of 2007, the AEEAP was revised and renewed for 2008-2012. The aim of the AEEAP is to “promote EE in the [ASEAN Member Countries] so that people of the region would be fully sensitized to care for the environment” (ASEAN Environmental Education Action Plan, 2008)

**Regional Agreements and Activities.** In the Pacific, the link between climate change and education was first formally established over a decade ago. In May of 2001, the Pacific Islands Forum was held in Auckland and during this meeting, ministers agreed to a Pacific Vision for education and to a number of goals including goals and commitments under the EFA framework. The key outcome of this meeting was the endorsement by Ministers of the Forum Basic Education Action Plan 2001 (FBEAP) (Pacific Islands Forum Secretariat, 2001). One part of this plan was to designate the University of the South Pacific (USP) in Fiji as the coordinator of the development of the Pacific Regional Action Plan for EDS (PESD). Subsequently, in 2006, the Pacific Ministers of Education endorsed PESD.

A replacement for FBEAP was implemented in 2009, called the Pacific Education Development Framework (PEDF), which runs from 2009-2015 (Pacific Islands Forum Secretariat, 2009). Of the eight 'cross-cutting themes' set out in PEDF, Theme #5 focuses purely on ESD. While the text of the theme does not mention climate change per se, it lists mainstreaming ESD as one of the priorities in the region (Hartmann et al, 2010, p.10). The aim of the Pacific ESD Framework is to integrate local content, conditions and culture to provide an umbrella for coordinated and collaborative action that can be applied throughout the Pacific (UNESCO, 2006).

Thus, awareness of the link between education and climate change has developed significantly in the Pacific region in the past decade. Yet, despite the increase in awareness, there is still a lack of a unified vision on this front, and without this, regional progress will be staggered and slow at best.

In tandem with these global and regional legal and policy developments there have been corresponding regional initiatives undertaken to further cement climate change adaptation and mitigation in the field of education.

One notable area where these initiatives are taking hold is in pre-service teacher education. In addition to being responsible for developing PESD, USP is also mandated as a regional organization for pre-service and in-service teacher education and research on climate change and sustainability (Pacific Islands Forum Secretariat, 2001). USP currently houses the Pacific Centre for Environment and Sustainable Development (PACE-SD) and within the Faculties of Arts and Law the School of Education and the Institute of Education (University of the South Pacific, 2012). As a result, pre-service teacher education at USP features climate change education. Two other national universities in the Pacific island region that provide teacher education are the University of Papua New Guinea (UPNG) and the National University of Samoa (NUS). Through the EduLink Pacific Network of Island Universities (NIU Project), these three universities are linked and working together on mainstreaming Education for Sustainable Development. In addition to these, Vanuatu Institute of Teacher Education has developed a course module on climate change within its pre-service teacher education program (Hartmann et al, 2010).

While these developments are promising, the overall linkage between education and climate change is lacking from most of the other higher education institutions in the Pacific region. In the US-affiliated Pacific Islands (USAPI), which consists of seven different community colleges, colleges, and universities, an effort is being made between higher education institutions and a

US-based NGO, Pacific Resources for Education and Learning (PREL), to create a Climate Education Certification Program for teachers. This effort, among others, will be discussed later in this paper.

**National Policy Initiatives:** At a national level, there has been difficulty for island governments to translate the array of regional initiatives on education and climate change into explicit national policies. Mentioned below are a few examples of Pacific island states and their efforts to incorporate climate change issues into their national education systems:

In **Vanuatu**, the Education Sector Strategy 2007-2016 has eight priority programs that demonstrate some level of attention EFA and quality education goals (Vanuatu Ministry of Education, 2006). While the Education Sector Strategy does not mention climate change, the draft curriculum statement does recognize the need for education to address climate change adaptation and mitigation in Vanuatu (Hartmann et al, 2010, p.12). Currently, the draft curriculum groups the environmental issues of biodiversity, climate change, and land degradation together through their obvious linkages.

In **Tonga**, the Education Policy Framework 2004-2019 is a document that sets out the long-term vision and a broad strategy outline for the development of the education system (Tongan Ministry of Education, 2004). While this also does not explicitly mention climate change, it does commit to aligning the education sector with the demands of the present and future in order to meet the objectives of Tonga's prevailing development plans. As such, it can be assumed that aspects of climate change will be included in school curriculum and the broader education developments.

In Tonga however, a stronger link between climate change adaptation and education is made by the Joint National Action Plan on Climate Change Adaptation and Risk Management 2010-2015 (Tongan Ministry of the Environment & Climate Change and National Emergency Management Office, 2010). In the vision set out in this document goal #2 of 6 is to ensure "Enhanced technical knowledge base, information, education and understanding of climate change adaptation and effective disaster risk management", which includes increasing relevant education and community awareness programs. The Ministry of Education is listed as the main responsible agency for achieving this goal, so even though climate change education is not explicitly mentioned in the Education Framework document, it is being incorporated into the curriculum through the more recent National Action Plan.

In **Kiribati**, the Ministry of Education's Strategic Plan 2008 – 2011 has now lapsed. (Kiribati Ministry of Education, 2008), and a new plan is still being formulated (UNESCO Apia, 2012). While the previous plan did not mention climate change per se, it was linked to the Government's National Development Strategies focusing on "Equipping people to manage change". One such change is alterations in the regional and global climate. Therefore, it is likely that the new plan, once formulated, will contain a much stronger link between climate change adaptation and education policy.

In **Fiji**, the Education Sector Strategic Development Plan 2009-2011 contained seven broad priorities and outcomes, to be achieved through a competency-based curriculum, which is "well

grounded in the local context”. Outcome #3 offers a link to environment by expecting that “school infrastructure and facilities are health compliant and ensure safety of children from natural disasters” (Fijian Ministry for Education, National Heritage, Culture and Arts, Youth and Sport, 2009). Although the link is relatively weak, and the plan has now lapsed, it shows that environmental issues are infiltrating the top level of education policy in Pacific states.

Sufficed to say, although climate change is a pressing concern for governmental leaders and policy makers of different Pacific nations, the crucial linkage between these concerns and education still needs to be strengthened. Education will help to ensure that a new generation of leaders will be more knowledgeable and better prepared to adapt their communities and environments to the impending impacts of climate change. Concurrently, the immense amount of research into climate change and the environment, along with the ingenuity put into local adaptation and mitigation activities, provides incredible learning opportunities for learners at all levels. If linkages among climate change policy, action, and education are strengthened and integrated, students would have access to the real-life, hands-on experiences that are grounded in effective science, mathematics, engineering, and technology (STEM) education. Hence, it is imperative that the bond between climate change policy and education policy is strengthened regionally throughout the Pacific as well as globally.

### **SUGGESTIONS MOVING FORWARD**

There is no question that we are all living in an increasingly interconnected world and that even the remotest villages of the Pacific are, in one way or another, feeling the effects of globalization. Resultantly, it has never been more convenient to be connected. Today, leaders from both business and political realms can connect, communicate, and collaborate across sectors and countries. Yet, more often than not, there is a feeling of isolation amongst individual island nations in the Pacific.

While some of the policy groundwork has been laid to address climate change at several levels of government, the need for solidarity among these islands has never been greater. As expressed by Alfred Roland Carlot, Vanuatu’s Minister of Foreign Affairs & External Trade, “[t]he challenges we are all facing are a stark reminder for the need to reinforce globalism and to force long lasting partnerships” (“Pacific Islands Work on Common Climate Change Policy”, 2012). Globalization, with new technology and improved connectivity, can be used to the advantage of small Pacific island countries to sustain working partnerships and build a collective voice to advocate for their needs on the global stage.

Though a collective voice can present a unified front, it must also recognize the multitude of cultures within the Pacific region. Oceania is home to unique ecosystems, cultures, languages, and indigenous knowledge. To blaze forth in the name of globalization can leave a society vulnerable to the risk of losing these invaluable treasures. Therefore, it is imperative that policy makers remain cognizant of the implications of globalization and to recognize that progress for the sake of progress is often too narrow of a scope.

In order to assist in the development of worldly citizens in the Pacific, governments must find ways, through supportive policies and projects, to simultaneously develop and strengthen bonds amongst one another in an effort to bolster the voice of the region. With a collective voice and a multi-sectoral approach to climate change - one that looks closely at environmental and climate education - the Pacific region can make significant strides towards progress on the global stage.

Here, we will highlight one example of a project seeking to combine the elements climate change, education, and collaborative action, all whilst balancing the importance of indigenous knowledge and cultural values. The project is known as the “Pacific islands Climate Education Partnership,” and is funded by the US National Science Foundation.

### **Pacific islands Climate Education Partnership**

In the USAPI, a movement has begun to reinvent climate education with the vision to bring community knowledge about climate into classrooms and students into community climate adaptation activities. The Pacific islands Climate Education Partnership (PCEP) - a collective of over 60 school systems, colleges, community organizations, and government agencies funded by the National Science Foundation - builds on the heightened realization among Pacific island communities that climate change is happening and threatens to cause more deleterious impacts in the future.

While decision-makers and community leaders have enacted adaptation policies and activities discussed above based on the most accurate climate research and community action planning, these communities also possess generations of intimate knowledge about the environment. PCEP encourages educators in both formal and nonformal settings to capitalize on this opportunity for students to learn from both western climate science and traditional ecological knowledge.

As seen below, PCEP is not advocating for a particular policy - it is a strategy to work with school administrators and community leaders within the current policy framework. By building the pedagogical and content knowledge among formal and nonformal educators at several levels, PCEP is building awareness of climate change and encouraging engagement in local adaptation activities among students, the next generation of Pacific island leaders.

**PCEP Strategic Planning.** The impetus of PCEP was two-fold: (1) there is an immense amount of policy- and community-level climate adaptation activity, accompanied by deep and pervasive traditional ecological knowledge, but (2) there is very little focus on climate science in schools. Focusing on climate science would require systemic change within the region’s ministries and departments of education to allow these community resources a place in the classroom. In a system of science education that tends to be strongly oriented toward the traditional science disciplines, the cross-disciplinary nature of climate science, and climate change in particular, means that the topic is often not well represented in curriculum standards, and finding a place for it in the classroom is not as simple as inserting a few extra benchmarks (Board on Science Education, 2010).

Initiating a shift of this magnitude requires planning and broad support from the K-12 school systems, colleges, and communities. Therefore, in its first two years (2010-2012), PCEP developed and nurtured a collaborative network of over 60 K-12 educators, local college

representatives, informal educators, climate scientists, learning scientists, and local environmental professionals to jointly develop both a Climate Education Framework and a Climate Education Regional Strategic Plan for implementing this framework throughout the region.

**Climate Education Framework.** The Climate Education Framework (CEF) outlines the main ideas and skills needed for K-14 (K-12 and community college) students to understand the science of global and Pacific island climates, along with climate adaptation and mitigation strategies. It is a ‘living document’ that draws strongly upon the following climate science, science education, and community action resources developed in the US and in the Pacific region:

- Climate Literacy Guide (USGCRP, 2009)
- Next Generation Science Standards (National Research Council, 2012)
- UNESCO Education for Sustainable Development and the Pacific Regional Action Plan for ESD (“Education for sustainable development lens, 2010)
- Indigenous knowledges and practices related to the environment from elders and long-time community members (Barros, 2012)

Additionally, resources like *Adapting to a Changing Climate* and the *Sandwatch Manual*, and their authors influenced the topics emphasized in the CEF. *Adapting to a Changing Climate* was developed by the Micronesian Conservation Trust in 2010 to be used as tool for establishing a common understanding of climate during community action planning (Gombos, 2010). Not only does it outline the basics of climate change and its local impacts with engaging visuals, but it emphasizes the importance of taking an ecosystem-level approach to discussing impacts and potential adaptation strategies. The Sandwatch Project is a UNESCO support network of schools and organizations that monitors and conserves local nearshore environments. Additionally, they provide a model for project-based learning that highlights the value of marine and shoreline resources in Pacific island environments (Cambers, 2010). The success of both of these initiatives in provide locally-appropriate programs that allow individuals to learn about how to take action against climate change inspired the approach to many of the activities proposed in the PCEP strategic plan.

**Regional Climate Education Strategic Plan.** Concurrent with the development of the CEF, the core PCEP partners executed a comprehensive strategic planning process to ensure that the diversity of voices represented within the partnership significantly contributes to this new vision for climate education in the USAPI. To do so, PCEP engaged in numerous community-building activities together to identify needs, brainstorm solutions, and ultimately develop a unifying vision for next steps. Planning was done primarily through seminal face-to-face planning conferences in Pohnpei (December 2011) and American Samoa (May 2012), followed by personal conversations and webinars to further develop plans.

The two face-to-face planning conferences (Community Partnerships for Climate Change Education and Adaptation Planning workshops) brought together a total of nearly 100 individuals representing a large majority of the partnership. Both meetings saw a diverse group

of partners - representatives from local and regional environmental NGOs, K–12 teachers and administrators, community college instructors and administrators, and climate scientists - come together to develop a common understanding of climate, current adaptation activities, and challenges of working within local school systems, and then begin making a change. At the Pohnpei workshop, participants developed a list of topics for the CEF. In American Samoa, building on the work of the Pohnpei workshop, participants initiated partnerships among schools and community organizations around climate education projects.

Out of these workshops, the countless informal networking conversations, and the writing and feedback process itself came four priority areas for the PCEP Climate Education Regional Strategic Plan -- (1) Climate Education Framework, (2) Indigenous Knowledges & Practices, (3) Learning & Teaching, and (4) Community-School Partnerships. All PCEP strategies center on the theme of place-based climate change education: the entities of the USAPI are in a contiguous geographic region and will experience similar impacts of climate change with some significant differences. The PCEP Strategic Plan brings together many separate activities into a coherent program, purposefully designed to integrate the education activities in such a way that the partners' actions and experiences can build on and inform one another.

**Priority Areas.** Within PCEP's four priority areas, the Climate Education Framework (CEF) and Indigenous Knowledges and Practices (IK) serve a critical role in bringing together all PCEP activities to focus on our shared understanding of what we expect students at different grade levels to know and be able to do related to climate science and climate impacts. All activities in the Learning & Teaching (LT) strand and in the Community-School Partnerships (CSP) strand are ultimately based on and guided by the CEF, which itself will evolve with lessons from IK activities.

But despite its coherence under the umbrella of a IK-embedded CEF, activities need to make sense in each of the individual geographic entities. The fact is that while all entities in the USAPI experience similar impacts of climate change, some very significant differences in potential impacts, local community adaptation strategies, and among the education systems require that PCEP's education strategy has distinct emphases in content and pedagogy in these diverse locations. The adjustments include modifications to content emphases, grade level expectations, timing of activities, and forms of professional development.

## CONCLUSION

The Pacific is a region that is rich in ecology, resources, history, culture, and knowledge. Each island in the Pacific has a unique story and climate change is now a major part of every island's story. Specifically, it has served as a catalyst for many changes on these islands, from the people, to the animals, to the land itself. This is a critical time in the story of the Pacific as the policies of today will ripple into the future. This is the time for ideas to become words, for words to become action, for action to become policy, and for policy to become practice. This is the time to ensure that the next generation of leaders will be equipped with the tools to face the climate-related challenges of the future so that they are able to continue writing the story of the Pacific.

As of the writing of this paper, PCEP is at the very early stages of implementing its strategic plan. While five more years lie ahead, the past two years have shown that this collective approach to climate education is serving as a model for how Pacific islanders are learning to live together again. Learning to live together does not mean homogenizing the diversity of Pacific island communities into a single entity. As PCEP's networking and strategic planning process shows, learning to live together is building on the work of others; sharing successes and reaching out for help; and developing a collective voice that is louder than any one individual, project, or country.

In the realm of climate education, this new collective voice is saying that our climate is changing; the inhabitants of the Pacific have valuable generations of experiences, resources, and knowledges that have brought us to this point in time and will continue to inform the way we live in and with our environment; and our communities, now and in the future, deserve a better way of life than what is in store for us if we do not learn from one another and take action together.

## Author Bios

**Mr. Daniel Lin** is a Specialist at Pacific Resources for Education and Learning (PREL) in Hawai‘i where he works primarily at the systems level to collaboratively research, design, adapt, and deliver technical assistance on climate, health, and educational issues in order to support sustainable change in the Pacific. Prior to joining PREL, Mr. Lin worked on the outer islands (Manu‘a) of American Samoa and has conducted cultural research in the Samoan Islands as a recipient of the National Geographic Young Explorers grant. Most recently, Mr. Lin completed a fellowship in the Asia Pacific Leadership Program at the East West Center in Hawai‘i. He is a member of the Climate Reality Leadership Corps, a global network of people dedicated to spreading awareness about the issue of climate change. Mr. Lin has a master’s degree from Harvard University and is fluent in English, Mandarin, and conversational in Samoan.

**Ms. Corrin Barros** is a Research Specialist with PREL. She currently serves as a Co-Project Manager for the Pacific Island Climate Education Partnership, a K-14 climate education initiative funded by the National Science Foundation. Additionally, she pursues and supports projects related to teacher professional learning, strategic planning, policy, food and nutrition, and traditional ecological knowledge in science education. Prior to joining PREL in September 2010, Ms. Barros served as a Research Assistant with the Hawai‘i Energy Policy Forum at the University of Hawai‘i and has worked with the Hawai‘i Association of Conservation Districts, first as a Conservation Planner, and then as a Program Manager. Ms. Barros holds a bachelor’s degree in biology from Linfield College and a master’s degree in urban and regional planning from the University of Hawai‘i at Mānoa.

**Mr. Christopher Foulkes** is currently working in the office of the Deputy Director for UNESCO Bangkok. There he focuses on supporting the office's strategic work in the "Cluster countries" of Myanmar, Lao PDR, Cambodia, Thailand, Viet Nam and Singapore, as well as assisting the deputy director in his other duties. Originally from New Zealand, Chris was brought up in Brunei before returning to New Zealand for his secondary and tertiary education. Mr. Foulkes has also spent time studying at the East West Center in Hawai‘i and working at the Migration Policy Institute in Washington DC.

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