4th Pacific Ocean Pacific Climate Change Conference

OUR OCEAN, OUR HOME: CLIMATE RESILIENCE FOR A BLUE PACIFIC

THE BOOK OF ABSTRACTS

MAY 20th – 24th

2024

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SPREP PROE
Sustainable, transformative and resilient for a Blue Pacific

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4th Pacific Ocean Pacific Climate Change Conference 2024

20 - 24 May 2024 in Apia, Samoa

Our Ocean, Our Home: Climate Resilience for a Blue Pacific

Tuesday, 21 May 2024

Parallel Sessions | Theme – Science and Climate Impacts		
Room/venue	**Session**	**Session Sub-theme**
D101	**D1-Session 1 (D1-S1)**	**The Changing Pacific (Physical Science focus)**

Regional comparison of current and projected sea surface temperatures and marine heatwaves for Vanuatu.

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Sea surface temperatures (SSTs) have been warming across the Pacific, as indicated in the past 40-year observational record. This warming is associated with observed increases in the frequency and duration of marine heatwaves (MHWs), periods of anomalously high ocean temperatures, and these trends are likely to continue with further global warming. MHWs have resulted in serious impacts on fisheries and marine ecosystems including those that provide critical habitat, coastal defense, and/or ecosystem services (e.g., coral reefs, seagrass). This is of particular importance to many Pacific Island countries that rely heavily on coastal and ocean resources for food security and livelihoods. Prolonged exposure to excessive ocean heat can also result in a coral stress response known as coral bleaching. While corals can recover from bleaching episodes, this is made more challenging as the frequency and duration of MHWs increases which reduces the time available for recovery between successive events. Degree Heating Weeks (DHW) is a commonly used metric that estimates coral stress taking account of both the length and magnitude of the MHW event. Through analysing climate model projections, we can better understand how warming oceans and MHWs may change in both the short- and long-term. This can help to inform planning strategies and adaptation responses. As part of the GCF-funded project *Climate Information Services for Resilient Development in Vanuatu* (Van-KIRAP), regional differences in ocean warming and MHWs in Vanuatu under current and future climate conditions were explored. SST and MHW metrics are presented for historic periods, and future projections for low (SSP126) and high (SSP585) emissions pathways from Phase 6 of the Coupled Model Intercomparison Project (CMIP6). Future MHWs were projected to occur to a dangerous level under the high emissions scenario, having serious implications for food security, livelihoods, and coastal defenses. Comparative results highlight the importance of following a low emissions scenario, which showed much more modest future projected changes. The impact of emissions scenario, as well as regional differences, were also evident in DHW analyses for locations identified as important by Van-KIRAP fisheries experts.

A case study of the Heavy Rainfall and flooding event over Samoa, 8th June 2023.

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The Samoa Meteorological Service monitored a severe weather event that produced extreme flooding in parts of Savai'i on 8th June 2023. A Heavy Rain Advisory was valid for all of Samoa, however, this phenomena was poorly resolved by the current model capability. The Fa'asalele'aga districts experienced a localized flooding of extreme magnitude that has not been observed in more than three decades. In the absence of a weather radar, the Met Office struggled to provide the people residing in the eastern region of Savai'i sufficient time to react and respond. According to the meteorological observations from the Met Office, the intense rainfall records from Vai'a'ata exceeded heavy rain warning thresholds by more than three times. This paper presents the science behind the flooding event, a summary of the meteorological observations, and the associated impacts. It also discusses some of the challenges faced by the Forecasters in the monitoring as well as recommendations for future events.

Reduction of uncertainties in tropical cyclone wave and storm surge hazards in Vanuatu: a hybrid downscaling approach.

Ron Hoeke[1]

Vanessa Hernaman[1], Sara O. van Vloten[2], Beatriz Pérez-Díaz, Jared Ortiz-Angulo[2], Leanne Webb[1], Emilio Echevarria[1], Claire Trenham[1], Julian O'Grady[1], Laura Cagigal[2] and Geoff Gooley[1]

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Vanuatu experiences significant coastal inundation and erosion impacts from tropical cyclones (TCs), and these impacts are projected to become significantly more severe with future sea level rise (SLR). However, there is a large range in local exposures to these hazards (for example, how protected an area is by reefs or offshore islands and/or how low-lying the area is). Also, not only does any particular location experience TC impacts differently, it experiences them relatively rarely, typically roughly once a decade or less (i.e. they are locally low probability, high impact events). These factors result in extremely high statistical uncertainties of associated local TC risks, particularly for future climate/SLR scenarios, where they are compounded by uncertainties in future climate projections. With the support of the VanKIRAP project, a national scale coastal hazard modelling system has been developed to address these uncertainties. The system is composed of an unstructured mesh numerical hydrodynamic circulation and wind-wave models (SCHISM-WWM3) that are two-way coupled (pass critical information to each other as the models perform their simulations). It is thus capable of simulating the combined effects of tides, storm surge, waves, background sea level variability in the dynamic nearshore coastal zone. The system has been used to produce a 40-year hindcast (historical simulation) as well as a "hybrid" downscaling methodology, which uses libraries of thousands of "synthetic" TCs as input, allowing for a better assessment of the probabilities of occurrences of coastal hazards. Extreme value analyses (EVA) of both the historical hindcast and the hybrid/probabilistic outputs illustrates the value of both, particularly the utility of the latter to drastically reduce statistical uncertainties in TC-induced coastal hazard information, including under a range of future SLR scenarios. Here, we provide an overview of this national modelling system, the coastal hazard/SLR scenarios information it produces, and examples of how this information can be used to explore and investigate associated climate risks. This includes its utilisation within the Vanuatu Climate Futures Portal, which facilitates investigating risks to Vanuatu's coastal infrastructure, including to roads.

ADB's Green Ports and Maritime Decarbonization Initiative

Warren Evans, Melody Ovenden, Maria Melei, Cindy Tiangco, Duncan McIntosh, Lisa Blazey and Simona Achitei

With 90% of global trade volume carried by sea, maritime transport is critical to global prosperity, yet shipping contributes 3% of global GHG emissions and is not accounted for in the Paris Agreement. It's estimated that over $1.9 Trillion will be needed to achieve the IMO's target of net zero by 2050. Investment in green and decarbonization technologies represents an upfront expense and a new type of investment which may not be readily supported by traditional maritime financing instruments. Financial support is needed to accelerate pathways for zero-carbon bunker fuels to enable industry to make confident long-term investments, and to enable developing countries to adapt port infrastructure to climate change. As Asia-Pacific's Climate Bank, ADB is committed to enabling a just transition for the maritime sector. To support this effort, ADB is developing a new flagship initiative to expand our portfolio of technical and financial support for green, resilient ports and maritime decarbonization.

Introduction to Coastal Science in a Changing Climate for Sustainable Development in the Pacific.

Gene Rankey
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Climate change is upon us; that we know. But how is it manifest in the dynamics of the oceans and the coastal zone? What challenges does climate change present in the coastal zone? What are the implications for island nations, coastal communities, residents, and businesses? How do these topics impact sustainability? What is the science behind the ongoing coastal changes, and how might it inform adaption or mitigation strategies and policies? These concepts are all of immediate relevance to Small Island Developing States (SIDS). And understanding these topics - and their implications - requires an understanding of the basic science. This introductory workshop on Coastal Science in a Changing Climate for Sustainable Development in the Pacific is being designed for non-scientists, professionals and practitioners involved with the sustainable management of marine and coastal resources, including managers, risk assessors, data scientists, GIS experts, educators, communications officers, tourism industry leaders, tour guides and naturalists, and blue carbon economics and policy experts. Early career science and engineering specialists also will find the broad scope valuable. Starting at a basic level, it will explore geological, chemical, physical and biological processes impacting Pacific coastlines, expanded to focus on how these nerdy science topics impact real people in real places. The workshop is designed to include lectures and hands-on practical exercises from Pacific Island Countries and Territories (PICT) to enhance learning, with time for discussion and the opportunity for delegates to share their challenges with the group and get feedback on possible solutions. Delegates will understand climate change, and how it impacts exposure and vulnerability to coastal hazards. Topics include marine heat waves, droughts, cyclones, sea-level rise, coastal erosion and inundation, coastal infrastructure, fisheries, reefs, blue carbon, and carbon budgets. It also presents an important step in building the capacity of individuals and organizations to respond and to develop mitigation measures to the many challenges and impacts arising from climate change and impacts on the coastal zone because of anthropogenic and non-anthropogenic activities. Furthermore, improving knowledge and understanding of the need for an informed and collaborative approach would lead to more programmatic and sustainable measures to protect vulnerable communities and ecosystems.

Assessing the Regeneration of Human Generated Mangrove Systems in Fiji – Case Study of Nasese and Lami Foreshore.

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The mangrove ecosystem is an essential part of the environment. There have been numerous planting initiatives from organizations and stakeholders in Fiji, yet there is lack of management and assessments to monitor and evaluate the succession of mangrove regeneration processes in a human generated system (mangrove ecosystem established through planting activities and initiatives). The current study explains the unique deep linkage of the vanua and the interconnectedness of the land and the people of the Pacific. A comparative study of Nasese and Lami was conducted to undertake sediment analysis, a monitoring and evaluation analysis between the two sites, determine stakeholders' roles in mangrove management, monitoring and evaluation, and to further suggest recommendations for mangrove policies and management plans for Fiji. Desktop research, sediment analysis, monitoring and evaluation visits, and key informant interviews to relevant stakeholders were employed for this study. Results from the sediment analysis indicated that there was an increasing quantity and presence of heavy metals have an indirectly proportional relationship to the survival rates of propagules at the Lami study site.The mangrove jurisdiction is governed by five Government ministries (the Ministry of Forestry, the Ministry of Environment, the Ministry of Lands and Minerals Resources, and the Ministry of Waterways). Findings from the key informant interviews highlighted the need to assess information that is available on the ground to better guide developments that directly feeds information to policy makers to negotiate and adhere to mangrove development advancements promoting local communities/ resource owners to design, plan, and execute mangrove related projects, and initiatives. The study provided recommendations in regards to human generated mangrove systems to: practice mangrove reforestation over mangrove afforestation; conduct a proper monitoring and evaluation on planting sites; mangrove planting activities need to be properly planned and scientifically supported before it is carried out to ensure high survival rates and the active involvement of the resource owners or local communities in which they take ownership of the maintenance, management, and monitoring efforts for the longer term. Fiji's Climate Change. Mitigation efforts needs to be up scaled and accelerated to allow fast recovery and boost carbon trade efforts, especially on the reforestation initiatives to be reinforced in the NDC. This can be achieved by recreating streamlined policies; developing a proper Mangrove Management Policy and determining the sole governmental ministry to have dominant jurisdiction for the mangrove systems around the coastlines of Fiji.

Sea-level Rise and Pacific Island Mangrove Resilience: National Assessment Initiative for Micronesia (FSM) and Palau.

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Mangroves survive sea-level rise through actively influencing sediment deposition and accumulating soil organic matter. Over geologic time scales, mangrove areas on Pacific high islands decrease as atolls are eventually formed through subsidence and sea-level rise; thus, processes that reduce mangrove area naturally are incredibly slow when uninfluenced by anthropogenic change. Indeed, as humans modify Pacific island shores, subtle shifts in elevation controls and mangrove species composition can occur, leaving certain areas potentially more vulnerable to rising seas as a balance between accommodation space (potential for vertical elevation expansion) and elevation capital (elevation above mean sea level). In 2021, the U.S. Geological Survey launched an effort to develop national sea-level rise vulnerability assessments for the mangroves of the Federated States of Micronesia and Republic of Palau through a combination of modeling application, using a soil cohort approach (WARMER), and experimental studies, using radioisotope dating of soil and surface elevation tables. Model simulations report on three sea-level rise scenarios through 2150 and enables iterative coastal zone planning options as mangrove areas retract inland or expand seaward while limited in migration potential by roads or mountain slopes. Simulations indicate that sea-level rise may impact mangrove species composition more than it will net mangrove area loss with moderate sea-level rise accelerations. As both mangrove area and species present (e.g., Rhizophora apiculata, Xylocarpus granatum) are critical to island subsistence, WARMER provides insight into the future, and directs caution to coastal developmental activities that would influence their natural adjustments to sea-level rise by way of sediment, root, and organic matter influence. WARMER development for Pohnpei has been completed, and Kosrae is underway. Plans are to direct our attention to Palau, and then to Chuuk and Yap in time.

Parallel Sessions | Theme – Science and Climate Impacts		
Room/Venue	**Session**	**Session Sub-theme**
D201	**D1-Session 2 (D1-S2)**	**The Extreme Pacific (Physical Science focus)**

The Pacific Drought Knowledge Exchange (PDKE): A co-production approach to building resilience to climate change in the Pacific.

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Finding ways to successfully adapt to observed and projected changes in the climate is arguably one of the most complex challenges Pacific people will have to face this century. Having the most up-to-date data and information is critical for successful adaptation planning and disaster response. Often, the data and information needed to make critical resource management decisions is not available, not accessible, or not applicable a meaningful scale. In addition, there often exists barriers to knowledge sharing between resource managers and researchers which prevents the transfer of data. The Pacific Drought Knowledge Exchange (PDKE) was created to explore knowledge co-production among researchers and resource managers with the goal of expanding the utility of drought and climate-related information for end users. Through information, training, and the development of decision support tools, the PDKE is intended to support four aspects of a knowledge exchange: 1) Easier access to climate data and related information sources; 2) Better and more comprehensive climate data; 3) Improved technical assistance; and 4) A more collaborative information transfer environment between researchers and end users. The PDKE project was piloted in Hawai‘i in 2019 with three partner agencies and has since grown to include many new partners across Hawaiian Islands, in Guam and in American Sāmoa. The PDKE team utilizes a co-production approach where resource managers are consulted throughout the duration of an engagement to ensure that end products have the highest utility. One of the PDKE’s most successful knowledge products is our Climate Change Climate Variability and Drought (CCVD) portfolio, which provides high-resolution, site-specific information about past, present and future climate to end users. Other PDKE products included plain language factsheets, maps, and site-specific climate timeseries data. The goal of this presentation is to introduce conference attendees to the PDKE project, share methodologies of product development, and to share ongoing and proposed work in the Pacific. Some additional thoughts will be shared on how a grass roots, grant funded, knowledge exchange can sustain itself in a shifting landscape of funding opportunities.

Monitoring Emissions in New Zealand – Today and in the Future.

Jamie Halla

DST, Auckland, New Zealand

With a population slightly over 5 million, New Zealand consists of two primary islands with a total area of 268,000 km2. It is currently the sixth largest island nation in the world, sandwiched between the Philippines and the United Kingdom. Much like other Oceanic nations the country's land mass is relatively miniscule in comparison to its Exclusive Economic Zone (EEZ) which totals over 4,000,000 km2, approximately 15 times the country's land area. Compared to more industrialized and populous nations anthropogenic emissions are relatively small. However, in comparison to other less-developed Oceanic islands, New Zealand's emissions are significant and very high per capita (fourth in the OECD). To accurately access the contribution of industry, travel and agriculture on the environment and to attempt to estimate our true impact on our climate and human health, several trace gas species should be measured. This talk summarizes the current status of the emissions measurements currently being made in New Zealand. In particular, measurements of trace gases such as nitrogen dioxide, sulphur dioxide and ozone in the troposphere are combined with values of particulate matter (both under 10 micrometres and 2.5 micrometres) to give a real time snapshot of air quality. Accurate measurements of both marine and aircraft emissions may also provide information on the type of fuel being used and engine efficiency.These emissions measurements provide a true starting value for climate modelling estimates of key pollutants. By combining accurate measurements with modelling and precise meteorology potential "hotspots" can be identified in advance, highlighting where climate change adaptations need to be made. New Zealand has ambitious targets to reduce net carbon emissions to 50 per cent of 2005 levels by 2030 and to reach net-zero carbon emissions by 2050. To reach our goal performing quality emissions measurements is an absolute requirement now and in the future.

Sub-national climate projections of mean and extreme climate for Vanuatu, VanKIRAP project.

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Like many Pacific nations, Vanuatu is particularly vulnerable to climate change, owing to its exposure to natural hazards, extensive low-lying coastal areas and dependence on natural-resources. To understand potential future impacts and make informed strategic decisions, build resilience and mitigate impacts, information about future climate change is essential. A new set of sub-national climate projections for Vanuatu was recently completed as part of the *Climate Information Services for Resilient Development in Vanuatu (VanKIRAP)* project, feeding into Climate Information Services (CIS) including a data portal and informing numerous case studies on vulnerability and adaptation over various sectors. We present the new climate projections from the VanKIRAP project, with a particular focus on the extreme climate variables. Mean and seasonal temperature and rainfall were projected over the 21st century using an ensemble of CMIP5 global climate models (GCMs), supplemented by a subset of 5 global models dynamically downscaled to 50km by the Conformal Cubic Atmospheric Model (CCAM) over the Australia-Pacific region. The regional downscaled modelling was also used to project changes in extreme temperature variables (hottest day, hottest night, coldest night) and rainfall (extreme daily rainfall), using extreme value analysis to represent changes in the 5, 10, 20 return-level extreme daily values, as well as annual extremes. Future change in all extreme temperature variables at all return levels are projected to increase at a similar rate to the mean temperature change. This suggests that the mean temperature change is a good proxy for change in the whole temperature distribution. An implication of this is that simple "mean scaling" of observed historical data can be used to create representative future daily temperature data including extremes, avoiding the need for a more complicated "quantile scaling" approach. For extreme daily rainfall, most models show projected increases at different return levels. The signal of increasing extreme daily rainfall events is clearest over the southern part of Vanuatu, where 1-in-20 year extreme daily rainfall events could be up to 50% greater. The change signal is much less clear in the north of Vanuatu, with less agreement between models. In general, the more extreme metrics tend to show larger magnitudes of change than the less extreme metrics. Sub-daily rainfall extremes were not modelled but are generally expected to also show significant increases. The results highlight the significant potential for increasing extreme rainfall events in the future and need to prepare for this.

Understanding the Challenges we face interacting impacts of Climate and Other Environmental Changes in the Pacific.

Liz Dovey

Resilience is the ability of people - and of living and social systems - to cope with hazards, disturbances or trends, to respond and recover in a timely manner and reorganise in ways that maintain their essential basic structures, function and identity. Adaptation to climate change - or transformation where adaptation is no longer feasible - will be more effective if the scale of change underway is appreciated, as well as the likely need for (and timing of) transformative actions. Understanding the degree and pace of change underway in different situations is not easy. Climate change is bringing change to the Pacific in so many big and little ways - changes in land, sea and air to temperature, rainfall, wind, ocean currents and levels, water chemistry, as well as to the large-scale climate features (such as El Nino Southern Oscillation, ENSO) that steer big weather patterns over months and years from stormy and wet to hot and drought afflicted. Each of these climatically mediated changes is entwined with other natural processes of environmental change over time from volcanic activity to earthquakes, as well as the many additional drivers of change brought by humans from land clearing and over harvesting to introduced invasive species. In every specific place at a specific time, each process of change interacts with multiple other processes. The results of each interaction may be synergistic, antagonistic, or neutral, and lead to complex cascades and networks of changes and impacts difficult to untangle and to appreciate. The results of this multi-stressor mix will differ over time and depend on the particular unique context under consideration. For example, Pacific islands vary enormously in age, size and shape, in location, in topography and altitude above sea level, in geology, geomorphology and soils, in marine surrounds, in the plant and animal life that can live on and around them, in configuration and relative position (e.g., solo island or archipelago, with close or far neighbours), in human history and in condition - especially where people have had a longer or more intense presence. Each of these contextual factors will influence the outcome of the combined climate and other environmental changes. These concepts will be expanded, and examples will be given.

Increasing the Resilience of New Zealand Housing from flooding.

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Like all of the Pacific region, New Zealand is experiencing the brutal impacts of climate change. In 2023, Auckland had the wettest January since records began in 1853, with many homes flooded. Only weeks after this record downpours, Cyclone Gabrielle struck dropping 400mm of rain within 12 hours to already sodden regions. Thousands of homes were flooded, 11 people died and a National State of Emergency was called. It is estimated that the cost of Cyclone Gabrielle's flood and rain damage was NZ$14 billion. Catastrophic events are likely with increased frequency and intensity. Two thirds of New Zealand's people live near rivers and coastal areas that are at risk of extreme flooding, putting $145 billion of property at risk. It is critical that homes at risk of flooding, wind damage and rain leakage are urgently adapted to increase resilience to climate change and to safeguard our people and the economy. A program of research is underway to investigate practical solutions for homes at risk of flooding. A case study was undertaken in the coastal suburb of Island Bay, Wellington. An assessment of housing typologies was undertaken, and strategies to protect, accommodate or retreat were proposed for typical housing structures. Protection measures includes sea walls. These are challenging to construct and maintain in the face of greater storm events, but provide a first line of defence. Adaption can include wetproofing parts of a structure. Case studies have shown that preparing the lower level of a house with materials that can tolerate a period of flooding and can be thoroughly cleaned are a second line of defence from flood events. The investment in these wetproofing homes needs to be carefully weighed with the intended remaining life of the life and risk of flooding. Retreat can include movable structures such as foundations on sledge tracks. Movable buildings or managed retreat is a last line of defence to be considered when other options have been considered. There is a lack of research and case studies on this topic and significantly more research is urgently required.

A Socio-Spatial Approach to Building Community Resilience to Climate Change.

Rhiannan Mundana

Spatial Vision

Despite contributing less than 0.03% of global greenhouse gasses, the Pacific Islands region and its communities are disproportionately affected by climate change impacts and associated disasters. Although an extreme weather event can be felt by many, it is often those that are most vulnerable within a community who will feel the greatest impact and suffer lasting the consequences. Geospatial intelligence can play a significant and unparalleled role in the building of community resilience by identifying, mapping and communicating climate vulnerability in those populations that are most at risk in light of climate change. By harnessing the latest climate data in concert with well-established climate risk frameworks outlined in the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports, Spatial Vision has developed a comprehensive spatial framework to identify those most vulnerable in the community to climate change. The framework details how climate hazards and exposure over time, coupled with the capacities and inherent sensitivities of vulnerable populations, can be used to assess the likely vulnerability to these changes, and hence risk and impacts. Learnings from the framework application allows the incorporate socio-spatial dimensions of vulnerable populations that considers the social, ecological, physical, institutional, and economic contexts in which they exist. The framework blends the fundamentals of spatial analysis with key insights from the social sciences and allows for case studies on how the model can be applied to populations and communities across the Pacific Islands region to effectively map vulnerability in populations most imperilled by climate changes. This framework is an invaluable resource for community development practitioners, local councils, emergency services and communities themselves, and has been developed to allow replicability and application across different regions and groups. It provides tools to identify and implement practical interventions aimed at bolstering resilience in the face of our changing climate and resultant extreme events.

Parallel Sessions | Theme – Science and Climate Impacts		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D1-Session 3 (D1-S3)**	**Oceans and Ice (Physical Science focus)**

Strengthening Pacific Engagement in the IPCC Assessment Reporting Cycles and Processes.

Mahealani Delany

Ofa Kaisamy, Professor Mark Howden, Yvette Kerslake, & Rick Zwaan.

The Intergovernmental Panel on Climate Change (IPCC) was created in 1998 with the objective to provide governments at all levels with scientific information that they can use to develop climate policies. The Sixth Assessment Report (AR6) is the IPCC's most recent assessment cycle and has provided current climate change information across four reports: The Physical Science Basis (WGI), Impacts, Adaptations and Vulnerability (WGII), Mitigation of Climate Change (WGIII) and the Synthesis Report (SYR), along with three special reports. They have been designed to inform policymakers all over the world across a variety of sectors. The Pacific Climate Change Centre hosted at SPREP have hosted a series of IPCC Pacific webinars and a regional dialogue in partnership with the Australian National University to provide the summary of the of the most up-to-date information on the IPCC reports to our diverse Pacific Island audiences as well as discuss key challenges with the report and the modalities of the IPCC plenary to strengthen Pacific knowledge and engagement around the work of the IPCC. The summary of the IPCC Pacific regional dialogue was presented to the Pacific Meteorological Council (PMC) in August 2023 and were reflected in the outcomes of the Pacific Meteorological Council. The Council recommended SPREP through the Pacific Climate Change Centre (PCCC) provide support to strengthen Pacific regional coordination and engagement with the IPCC and related processes in collaboration with National Meteorological and Hydrological Services (NMHs) and other national regional partners and agencies and encouraged nomination of national IPCC focal points and an alternative IPCC focal point. Recommended NMHSs to be actively involved where appropriate in the collaborative development and delivery of Pacific climate science and science-based services as part of the ongoing IPCC and annual COP/UNFCCC process in the Pacific and endorsed the priority need for regional coordination, harmonisation and ongoing technical support and development of best-practice IPCC aligned scientific knowledge, products, services, capacity and practical applications in partner PICs. Further talanoa sessions are being conducted with UK and Chair of IPCC on strengthening Pacific Islands Engagement with IPCC and where appropriate in the collaborative development and delivery of Pacific climate science and science-based services as part of the ongoing IPCC and annual COP/UNFCCC process in the Pacific. This paper will discuss the progress to date on Strengthening Pacific Engagement in the IPCC Assessment reporting cycles and process and way forward for coordination and resource mobilization.

Pacific Carbon Effect: How carbon-intensive are construction aid projects in Samoa?

Ryan Simpson

Robyn Phipps, Robin Skinner

Wellington School of Architecture, Victoria University of Wellington, New Zealand

Low carbon buildings are necessary to ensure all developed countries meet their commitment to the Paris Agreement of limiting the increase in global average temperature below 2 degrees Celsius above the preindustrial levels. Developing countries such as those in the Pacific Islands struggle to construct good quality infrastructure let alone low carbon buildings because of their capability, geographical isolation, availability of good quality materials and financial constraints. Donor countries such as New Zealand, Australia, Japan and China fund these aid projects from design to construction in their support of developing countries. The design stage becomes a vital check point to determine the size of the building and the quantity of specified materials. The majority of materials in construction aid projects are procured from overseas, and are frequently sourced from the donor country, with transportation over long distances creating a significant increase in carbon footprint. A research project has commenced to conduct a Life Cycle Analysis (LCA) methodology of the superstructure for a new educational building located in Faga primary school in Western Samoa funded by JICA. The framework will build on traditional LCA approaches and include an examination of durability and maintenance requirements in a harsh maritime tropical climate, and the carbon footprint specific to the unique elements to the Pacific Islands. The aim of this research is to quantify the carbon effect in recent Pacific aid projects and identify strategies to achieve climate resilient projects in the Pacific Islands with a focus on carbon reduction.

Integration of GNSS and InSAR to optimise estimates of coastal VLM.

Ian Hamling[1]

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A growing number of studies have highlighted the efficacy of combining regional GNSS with InSAR observations to provide high resolution estimates of coastal VLM. While InSAR can provide dense spatial sampling, it is only a relative measure of deformation. However, when properly tied to GNSS observations, which provide a regional picture of the deformation, coastal VLM can be calculated at 10s to 100s m resolutions. Here we explore some successful examples where coastal VLM have been estimated at regional to national scales and explore the potential fusion of these datasets to better estimate VLM across the Pacific region. Unlike previous nationwide estimates, the Pacific Islands pose technical challenges where local/regional GNSS are not always available. Furthermore, many of the Island nations have volcanic origins adding time-varying deformation to the challenge. However, with the current and future suite of radar satellites, improved searise projections and broadening GNSS networks, there is a real opportunity to provide Pacific wide VLM estimates for better preparedness in the future.

Modelling shoreline change – A case study in Tuvalu.

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The shorelines of sandy atoll islands are highly dynamic, eroding and accreting (growing) in response to wave conditions and mean sea-level. Communities on atoll islands frequently live and build structures directly adjacent to the shoreline, and so they are directly impacted by erosion and accretion. As the climate is changing, mean sea-level is increasing and wave conditions are changing, which will significantly impact these coastal communities. To better understand how the shorelines of atoll islands change from year-to-year, we have partnered with the Pacific Community (SPC) to develop a model using a novel statistical approach, Bayesian networks (BNs). We use Nanumea, Tuvalu, as a case study location, and we build the model on existing wave modelling and satellite image data from 2003 - 2020. The BN consists of key variables and the statistical relationships between them, and it is presented as a graphical user interface. It gives fast predictions of how the shoreline is likely to change in response to wave conditions. While we have focused on the physical system in this project, the long-term view is for this model to be used as a decision-making tool, with scalability in mind during its design and the potential to expand the network by adding components to assess risk and impact.

Adaptation and resilience in Budibudi atoll (Papua New Guinea).

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What makes an island resilient? Small islands in general and atolls in particular are said to be fragile on account of their size, the high ratio of coastline to land area, their thin topsoils, limited access to freshwater and their exposure to hazards such as droughts, king tides and cyclones. In addition to this, the remoteness, lack of transport, communications and other essential services of many Pacific islands makes them particularly vulnerable to climate change. And yet, despite their alleged vulnerability, some Pacific atolls display levels of resilience and adaptability that challenge the negative characterization of low-lying islands. Budibudi atoll in Papua New Guinea is a good case in point. Based on four months of ethnographic fieldwork during a severe ENSO-driven drought, this presentation explores the elements that make up Budibudi's resilience. It argues that the knowledge systems of Budibudi islanders inform a number of socio-cultural institutions and practices that are grounded on traditional values and norms and which accommodate responses to short and long-term environmental changes. Ultimately, Budibudi offers valuable lessons on how traditional worldviews and practices can form the basis of climate change adaptation strategies for other islands in the Pacific.

A Strategic Marketing Approach to Cultivating Sustainable Home Gardening Projects.

Bernadette Samau, National University of Samoa

Sesilia Lauano, National University of Samoa

Across the globe, fruit and vegetable gardening projects at primary and secondary schools focus on environmental, health, social and educational initiatives to support two overarching 2030 Sustainable Development Goals (SDG) targeting Zero Hunger by increasing food security, improving nutrition, and promoting sustainable agriculture and improving Health and Wellbeing. These projects have proven to stimulate classroom curriculum learning on health literacy, nutrition, diet, and ecological conservation practices as well as encourage healthy eating habits. Many primary and secondary schools in Samoa over the years took part in school vegetable gardening projects, as part of national and community-led initiatives to target Zero Hunger and promote better Health and Nutrition behaviours and consumption choices. These projects are either fully funded by overseas donors or sponsored through local community projects facilitated by relevant government ministries. School gardening projects bring about positive impacts on education and learning. However, the literature on local school gardening projects does not account for changes in students' behaviour toward healthy eating. Neither does it account for the roles that parents or the student's family plays in keeping the gardening momentum going, outside of the classroom. Subsistence farming is common in Samoa, with more than 80% of land held under customary ownership. Nevertheless, the practice of selling one's harvest for profit over personal or family consumption is common among households. This paper proposes a strategic marketing approach to cultivating sustainable gardens. Through an extensive review of the literature and an examination of practices from the disciplines of consumer behaviour, strategic marketing, home gardening and the contribution of gardening to food security, the authors present the AIDA Model as an appropriate framework to cultivate sustainable home gardening in Samoa. The AIDA Model (Attention, Interest, Desire, Action) is an Advertising effect model that identifies the stages an individual goes through during the process of consumption. The authors contend, that where services and products exist, marketing also exists and parents as consumers play a critical role in the sustainability of home gardening initiatives and consumption decisions aimed to promote Zero Hunger and Healthy eating.

Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
D101	**D1-Session 4 (D1-S4)**	**The Sour Pacific - Ocean Acidification**

Pacific Islands Ocean Acidification Centre (PIOAC).

Katy Soapi[1]

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Ocean acidification (OA) is a global issue that affects local marine ecosystems. The Pacific Islands region is especially vulnerable to OA because community livelihoods are directly connected to thriving coastal ecosystems. However, at present, the capacity to research and monitor OA in the Pacific Islands is limited. The Pacific Islands Ocean Acidification Centre (PIOAC) was formed in 2021 through combined international and localized efforts to house, maintain and distribute research equipment tailored to regional needs, host regional training activities in order to develop monitoring expertise, support new and ongoing OA monitoring activities, ensure regional OA data are accessible, and provide training support and technical assistance through an international community of practice. This presentation details how the PIOAC could serve as a model for building locally-owned capacity for OA research through public-private partnerships for Small Island Developing States (SIDS). This presentation will also speak to the challenges and future outcomes of OA research in the Pacific Islands region.

The combined effects of ocean acidification, warming and light on Caulerpa spp., the role of inorganic carbon physiology and species ranges.

Aleluia Taise

Erik Krieger, Sarah Bury, Christopher E. Cornwall

Caulerpa is a widely distributed genus of chlorophytes (green macroalgae) that is important for its dietary, social and coastal ecosystem value. Ocean acidification (OA) and ocean warming (OW) both threaten to change the distribution of macroalgae in New Zealand and globally. Two of the most common *Caulerpa* species in Te Whanganui a Tara Wellington, Aotearoa New Zealand, *Caulerpa brownii* and *C. geminata*, could have vastly different responses to both OA and OW because of their divergent dissolved inorganic carbon (DIC) uptake strategies and distance from range edge. However, responses to both stressors of OA and OW could be heavily mediated by light. To address these concerns, I conducted four manipulative laboratory experiments to test the effects of OA, OW and marine heatwaves (MHWs), and reduced irradiance, and interactive effects of two or more stressors on *Caulerpa* species. In this seminar, I will share some of the key findings from my study and how my research contributed new knowledge to add to literature about the effects of ocean change on macroalgae with various DIC uptake mechanisms and distribution edge positions.

Enhancing Coastal Resilience in Pacific Island Countries through Seagrass-Based Wave Protection.

Lency Royce Muna

PhD Student, University of New Caledonia

Pacific Island Countries (PICs) face increasing vulnerability to extreme wave conditions exacerbated by rising sea levels due to climate change. Addressing this challenge necessitates strategic planning for the protection of coastal communities and assets. Nature-based solutions offer sustainable approaches to enhance the resilience of coastal areas against physical impacts like wave-induced erosion. In this study, which was conducted in Fiji, the efficacy of shallow sub-tidal low-canopy seagrass beds (dominated by *Halodule uninervis*) in providing coastal protectionservice, particularly in barrier and fringing reef environments was investigated. The data required to quantify wave height and energy reduction as waves propagated across seagrass beds towards the shoreline was collected using bottom-mounted pressure sensors. Data was collected over a period of 2 weeks at each reef environment and later analyzed to quantify wave energy in seagrass beds. The results indicate that these seagrass beds exhibit considerable potential in reducing wave height by an average of 30% and wave energy by 47% in both reef environments. Notably, the efficacy of wave reduction is influenced by factors such as water depth, seagrass characteristics, and local reef conditions. The results underscore the role of seagrasses in bolstering the resilience of coastal shorelines against wave erosion. Protecting and conserving healthy low-canopy seagrass habitats can yield tangible benefits for shoreline protection in Fiji and other PICs. This research contributes valuableinsights for coastal management strategies, emphasizing the importance of integrating nature- based solutions into adaptation efforts to mitigate the impacts of climate change on vulnerable coastal communities while enhancing resilience.

Spatial and temporal distribution of seawater pH and alkalinity across five sites on the North coast of Upolu, Samoa.

Tina Taitaifono Mareko[1]

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Ocean acidification, driven by the dissolution of approximately 30% of atmospheric carbon dioxide (CO_2) into seawater, poses a significant threat to marine ecosystems. This process, which involves the conversion of CO_2 into carbonic acid and subsequent reduction in seawater pH, has detrimental effects on calcifying organisms such as corals, by depleting carbonate ions essential for their skeletal structure. Despite its importance, the spatiotemporal variability of seawater carbonate chemistry in Pacific island coastal regions, including Samoa, remains poorly characterized. To address this knowledge gap, the author conducted a study to investigate the variability in seawater carbonate chemistry at five sites along the North coast of Upolu Island, Samoa. The mean pH was measured spectrophotometrically using the m-Cresol purple buffer and determined total alkalinity (A_T) through titration with standardized 0.101970 mol/kg HCl. The measured values from the spectrophotometer at three wavelengths: a non-absorbing wavelength (730 nm for m-Cresol purple) and at the wavelengths corresponding to the absorption maxima of the base (I^{2-}) and acid (HI^{-}) forms of the dye respectively (578 and 434 nm) and the EMF values from the seawater titration were used to calculate the actual pH and A_T. The results indicate significant variability in seawater carbonate chemistry across the five sites. The mean pH values ranged from 7.944 ± 0.090 to 8.087 ± 0.069, falling below the mean average pH of 8.1 for open ocean water. However, the mean seawater A_T values fell within the normal range of 2100-2500µmol kg^{-1}, indicating that the coastal waters are within a healthy range for alkalinity. These findings provide valuable insights into the local marine environment and highlight the importance of continued monitoring and conservation efforts.

Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
D201	**D1-Session 5 (D1-S5)**	**The Living Pacific**

The Importance of Media and Natural Language Processing (NLP) in Climate Change Resilience.

Peter-Lucas Jones

CEO
Te Hiku Media
www.tehiku.nz

The project I seek to present is 'Leveraging te reo Māori natural language processing for collaborative climate change action'. The project considers the needs of communities around Aotearoa, New Zealand and the impacts of climate change and adverse weather conditions in relation to our place in the ocean. Communities look to researchers, community leaders and decision-makers for guidance to help them move towards climate resilience. Some communities also look to ancestral knowledge about the ocean and land, mātauranga Māori, for guidance and the right path forward. For researchers who seek to bring those two knowledge systems together, there is no technology available to support them. This project explores a collaborative platform that will synthesise and analyse data in te reo Māori using natural language processing tools to support research, policy and strategy development for climate action. The project will leverage existing tools developed by Te Hiku Media, including an accurate bilingual automatic speech transcription for te reo Māori and NZ English, Māori language voice synthesis, and build new tools that will make working with te reo Māori data and mātauranga Māori easier and more effective. The project focuses on creating and fine tuning language tools for climate change research and mātauranga Māori (Māori knowledge).

Food loss along the value chain of Taro: a look at Postharvest handling practices of Taro and climatic hazards in Samoa and Tonga.

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Food loss and waste crisis represent a complex and multifaceted global issue that has created far-reaching impacts on the global and local economy, social welfare, and environmental sustainability. This study looks at food loss along the Taro value chain, with a focus on postharvest handling procedures in Upolu, Samoa and Tongatapu, Tonga. The objective of the study is to gain a better understanding of causes including climatic factors on food loss in taro, and understand procedures and identify strategies for reducing food loss, improving economic outcomes, and promoting better nutrition and resilience for households involved in the Taro value chain. The study also compares and contrasts the postharvest handling practices and losses between the two locations to gain insights into the similarities and differences in Taro farming practices in Samoa and Tonga. Data for this study were collected through fieldwork, including interviews with farmers, taro sample collections, and laboratory analysis. A total of 80 farmers were surveyed with a few farmers shadowed from harvest to point of sale. The study findings contribute to knowledge on the causes of food loss, how to reduce food loss and waste in the Taro value chain and promote sustainable agriculture practices to achieving resilience in Samoa and Tonga.

Nature-based Solutions for Urban Climate Change Adaptation in Te Moananui Oceania: Centring Wellbeing and Indigenous Knowledge.

Maibritt Pedersen Zari[1,2]

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Nature-based solutions (NbS) aim to enhance the resilience of ecosystems, their capacity for renewal and their ability to provide ecosystem services. As such they are valuable strategies to address societal challenges such as climate change and the pressures of urbanisation. Multifaceted NbS work with, rather than against, nature and can lead to more effective and culturally rooted solutions to societal challenges, by concurrently resetting socio-cultural systems through the restoration of ecological systems across interconnected landscapes, ocean ecologies, and the built environment. NbS have gained growing recognition globally as integrated approaches for responding to climate change, biodiversity loss, and broad sustainable development and resilience challenges. NbS, linked with traditional ecological knowledge (TEK), provide a critical opportunity to generate innovative adaptation responses to climate change in Te Moananui Oceania. Although considered to be innovative in terms of urban infrastructure design, the practice of working closely with nature to create and design effective and resilient human settlements while maintaining healthy ecosystems, has always been a cornerstone of traditional societies in Te Moananui Oceania. Indigenous knowledges, recognising the oneness of nature and culture, have long held that human wellbeing is inextricably connected to ecosystem health. Building on Indigenous framings of wellbeing and partnering TEK with NbS, leads to specific place-based urban design responses that offer long-term benefits in diverse Te Moananui Oceania contexts. This is particularly significant given climate change pressures faced by Te Moananui Oceania coastal communities and is important in the Te Moananui context given that most NbS research, framing, and definitions have emphasised approaches from the Northern Hemisphere with very different conditions and considerations. A team of researchers from across the region has been investigating how nature-based urban design solutions, rooted in Indigenous knowledges, can support climate change adaptation and individual and community wellbeing in various urban Te Moananui Oceania settings as part of the NUWAO (Nature-based Urban design for Wellbeing and Adaptation in Oceania) project. A variety of research and engagement methods including participatory mapping and design; fieldwork; ecological, climate, and cultural mapping; community workshops and interviews; design competition; collation of NbS design strategies into a regional guide; and other design-led research, have been used to investigate a way of approaching nature-based climate change adaptation that is unique to Te Moananui Oceania, grounded in climate

justice and framed around local notions of human health and wellbeing. Principal project findings demonstrate that working with nature is likely to have deeper cultural meaning in the region as well as potential political implications. This means there is a need to apply a cultural, values-based approach to adaptation that acknowledges the interconnected notion of living ecologies prevalent in TEK of Te Moananui Oceania, rather than adopt just a strictly technical Western science model approach. A framework for advancing nature-based adaptation in Te Moananui Oceania is presented that acknowledges the unique and diverse contexts and human-nature relationships found in the region.

Community Engagement – Fa'afafine And Fa'afatama Perspectives.

Fagalima Tuatagaloa

Chair and Activist, Environment and Climate Change Sub Committee
Vice President, Samoa Fa'afafine Association ("SFA") Inc.

Samoa is an independent state in the Pacific region with its traditional Samoan way remains the strong force in Samoan life, economy and politics. It is known as one of the countries with a highly culturally recognised and pronounced gender diverse population. Fa'afafine and Fa'atama are indigenous SOGIESC citizens of Samoa. Despite being a culturally highly recognised identity, fa'afafine and fa'atama do not get recognition in the local policies and legal instruments. There are no official national statistics collected on fa'afafine in Samoa, though some estimates place fa'afafine at five percent of Samoa's total population. Thus, fa'afafine and fa'atama remains vulnerable and marginalized in many ways including climate change actions. When we speak of climate change as a threat for everyone, it does not affect everyone collectively and equally. The impacts of climate change in Samoa still impose structural inequalities on our social and economic life.We believe that platforms like conferences may culturally or socially or academically recognize our beings and here our voices. Climate change is a global issue and it affects every human being living in this world. It is evident in many events that this community is always leaving behind and not being engaged in community consultations and high-level dialogues. While we face discrimination and obstacles to our social and legal recognition within Samoa, our community looks beyond all that and advocates strongly and loudly for collective actions and shared responsibilities in combating key impacts of climate change that we may face at any point in time, such as discrimination, violence, exploitation, exclusion and homelessness. With our innovative and productive ideas, our messages are conveyed creatively in different genres of arts such as performing arts, visual arts, fine arts, conceptual arts, contemporary arts and more. Till now, most Samoans are still living a communal way of life, participating in activities collectively. Thus, we need this platform to work well and effectively with the government and all stakeholders including vulnerable groups so no one is leaving behind. We are loud because we are citizens ("tagatanu'u") of the land. We fight because climate change is everyone's problem and responsibility. Our visibility grows bigger because we value our environment as our heritage and as a human right based approach for climate change actions. Climate justice happens when all members of society, despite their gender identities, are recognized, included and engaged in climate change actions. We must involve in all dialogues to help drive climate change policies and strengthen mitigation and adaptation efforts for the benefit of everyone.

Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D1-Session 6 (D1-S6)**	**Pacific livelihoods**

Natural Resources and Biodiversity in a Warming World: Challenges and Opportunities.

Georgina Kalsing

The presentation aims to explore the impact of global warming on natural resources and biodiversity, as well as to highlight the potential implications for ecosystems, human well-being, and sustainable development. The objectives of the presentation are to analyse the current state of natural resources and biodiversity in the context of climate change, to examine the methods for assessing and mitigating the impacts of global warming on ecosystems, and to discuss the implications for policy-making and conservation efforts. The methods employed in this presentation include a comprehensive review of scientific literature, case studies, and empirical evidence to elucidate the complex interactions between global warming, natural resources, and biodiversity. Additionally, the presentation incorporates data and analysis from reputable sources such as the Intergovernmental Panel on Climate Change (IPCC), the World Wildlife Fund (WWF), and the United Nations Environment Programme (UNEP) to provide a robust and evidence-based assessment of the subject matter. The implications of the findings presented in this study are far-reaching and multifaceted. Firstly, the impact of global warming on natural resources and biodiversity poses significant challenges for ecosystems, including changes in species distribution, habitat loss, and increased vulnerability to extreme weather events. These challenges have direct consequences for human societies, including threats to food security, water availability, and livelihoods, particularly in vulnerable regions. Furthermore, the presentation underscores the urgent need for coordinated efforts to mitigate the impacts of global warming on natural resources and biodiversity. This includes the implementation of climate-resilient conservation strategies, the promotion of sustainable land and water management practices, and the integration of climate change considerations into biodiversity conservation and natural resource management policies. Additionally, the presentation emphasizes the importance of enhancing public awareness and engagement to foster a greater understanding of the linkages between global warming, natural resources, and biodiversity, and to mobilize support for conservation and climate action. In conclusion, the presentation provides a comprehensive overview of the challenges and opportunities associated with global warming, natural resources, and biodiversity. It underscores the critical importance of addressing climate change impacts on ecosystems and highlights the potential for innovative solutions and collaborative approaches to safeguard natural resources and biodiversity in a warming world. Ultimately, the implications of this study call for concerted action at the local, national, and global levels to mitigate the impacts of global warming, conserve biodiversity, and ensure the sustainable management of natural resources for the benefit of present and future generations.

Nanumaga Water C.A.R.E Project.

Elisa Paueli

Local Consultant of Tuvalu Water and Sanitation and Hygiene (WASH) Committee, Secretary Sulivanu Sama of Nanumaga Island Council, Construction Officer of Tuvalu Public Works Department (PWD), and Nanumaga Island Youth.

The Nanumaga Water C.A.R.E (Community Awareness and Responsibility Engagement) Project is a comprehensive community initiative designed to foster a sustainable and resilient water ecosystem within the Nanumaga Island community in Tuvalu. With a primary focus on raising awareness, the project seeks to empower locals with the knowledge and practices essential for preserving water quality and ensuring sustainable water usage. By instilling a sense of responsibility and understanding of the critical role water plays in community well-being, the project aims to fortify the resilience of water resources and mitigate the risks of contamination, securing a healthier and more sustainable future for Nanumaga Island and its people. This project objectives aims to establish a comprehensive framework for responsible water management through community outreach by conducting educational workshop, practical training initiatives, and fostering ownership through clean-up event. It aims to raise awareness about pristine water sources, promote sustainable usage, and encourage active participation in water conservation practices. Through these strategic objectives, the Nanumaga Water C.A.R.E project aspires to create a resilient and water-secure community, well-equipped to safeguard its precious water resources for current and future generations. To achieve the aforementioned objectives, the project employs data collection methods involving interviews with water experts from the WASH committee, along with experienced construction officer of Tuvalu Public Works Department (P.W.D), and respective of one local community leader namely the Secretary of Nanumaga Island Council. Additionally, a survey conducted through distribution of questionnaires to local members of Nanumaga Island community is another method used to collect essential data and active participation to ensure effectiveness of this project with the help and support of the local youth members of Nanumaga Island Community. The implications of successful project implementation are extensive, encompassing ecological benefits such as the preservation of local ecosystems, improved public health outcomes through reduced waterborne diseases, economic advantages arising from enhanced resilience against water-related crises, and the potential to serve as a regional model for sustainable water management practices. Ultimately, the Nanumaga Water C.A.R.E Project endeavours to secure a healthier and more sustainable future for the community, setting the stage for positive environmental impact beyond its immediate boundaries. Affiliations crucial to the success of the project include, local consultant of Tuvalu Water and Sanitation and Hygiene (WASH) Committee, Construction Officer of Public Works Department, Secretary Sulivanu Sama of Nanumaga Island Council and youth members of the Nanumaga Island Community. Collaborating with these important people brings expertise, resources, and broader community reach to the initiative. In conclusion, the Nanumaga Water C.A.R.E Project seeks to instill a sense of responsibility, awareness, and practical knowledge within the Nanumaga Island community regarding sustainable water management. By addressing this fundamental aspect of community well-being, the project not only contributes to immediate positive changes but also lays the groundwork for a resilient and ecologically conscious community in the long run.

Protecting freshwater resources in Samoa: macroinvertebrates and eDNA analyses.

Velonika Nikki Eteuati

Massey University
[1]Professor Peter Lockhart – Pacific Dean College of Science (main supervisor, PhD)
[2]Professor Palatasa Havea – Dean Pacific Office of the Provost (supervisor PhD)

The National University of Samoa
[1]Professor Patila Amosa – Vice Chancellor (supervisor PhD)

My presentation aims to enhance water quality monitoring capabilities and strengthen water surveillance proficiency in Samoa. It builds on local/ traditional knowledge of freshwater macroinvertebrates in Samoa and involves microbiology assessments of rivers and streams using eDNA. It will focus on the first year of my PhD study where I have evaluated the use of passive eDNA sampling of streams, PDQeX DNA extraction from filters, 16S rRNA gene PCR amplification and ONT sequencing for taxonomic assignment. Passive eDNA sampling in the coastal, middle, and upper reach of the Vaisigano river in Upolu Samoa was conducted in October 2023, The ONT sequencing of bacteria and insect eDNA present in the water of this river has now been completed and data analysed. At the time of sample collection, I also collected invertebrates, morphologically characterised these and sequenced their mitochondrial cytochrome oxidase genes as done in my MSc studies. By gaining a better understanding of the macroinvertebrates present under varying river and stream conditions, my project will establish the foundation for community water quality surveillance. This surveillance will be based on observing the occurrence of specific invertebrates in waterways and noting the timing of their presence. With an increased understanding of freshwater invertebrates and the factors influencing their presence and abundance, there is potential to assist rural communities in Samoa in identifying the most informative invertebrates for monitoring water quality. Given the widespread use of mobile phones in Samoa and across Oceania, envisioning the future use of phones to record and report findings in a national surveillance program is plausible. I hope that this project, rooted in fieldwork in Samoa, could serve as a model for similar endeavours elsewhere in Oceania.

Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
D101	**D1-Session 7 (D1-S7)**	**Impacts health and wellbeing**

The Impact of Climate Change on Youth Sexual and Reproductive Health in Africa and the Pacific Region.

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Climate change threatens the Sexual and Reproductive Health and Rights (SRHR) of young people across Africa and Pacific Island nations. Rising temperatures, extreme weather events and ecological changes exacerbate existing SRHR risks, with disproportionate impacts on girls, young women and marginalized youth. Climate impacts are linked to early marriage, transactional sex, unintended pregnancy, unsafe abortion, menstrual hygiene challenges, HIV/STIs, malnutrition, maternal morbidity and waterborne diseases. In the Pacific, sea level rise and disasters displace communities, driving migration-related exploitation. Climate stresses also intersect with high adolescent birth rates and limited youth SRHR services in both contexts. Cases from Senegal, Madagascar, Ethiopia, Mozambique, Papua New Guinea and Vanuatu showcase diverse climate-SRHR pathways. Droughts and floods contribute to early marriage in Senegal. Cyclones and rainfall impact contraceptive access in Madagascar. Extreme heat threatens menstrual hygiene for girls in Mozambique. Climate migration separates adolescents from familiar SRHR support systems and exposes them to transactional sex. Coastal erosion places additional burdens on young mothers in Papua New Guinea. Coastal erosion is a growing problem in Papua New Guinea, posing a major threat to coastal communities and infrastructure. This paper examines the impacts of climate change on youth sexual and reproductive health in Africa and the Pacific. It explores how rising temperatures, drought, flooding, and other climate change effects influence early marriage, sexually transmitted infections, unintended pregnancy, and access to sexual health services among young people. Coastal erosion is a growing problem in Papua New Guinea, posing a major threat to coastal communities and infrastructure. Rapid erosion along the northern coast of Papua New Guinea is resulting in loss of land and assets, damage to ecosystems, and risks to human health and safety. An extensive literature review was conducted to synthesize prior research on connections between climate change and youth sexual health outcomes including early marriage, unintended pregnancy, and sexually transmitted infections. Academic databases were searched using relevant terms and existing studies were analyzed to develop a conceptual framework for the study. Government, Civil Society Organizations and Youth-led organizations must provide cyclone preparedness training linked to SRHR support in the Pacific Region. Such programs underscore the agency of young people to adapt to climate impacts while advancing health, empowerment and equality. Governments must drive strategic investments and policies to safeguard the SRHR of diverse youth populations in Africa and the Pacific amidst a changing climate. In general, there should be measures by the respective states to improving resilience, education, family planning services, and health systems to promote the sexual and reproductive wellbeing of young people in the face of escalating climate change threats in Africa and the Pacific region.

Models of psychological resilience in the face of climate emergencies – examples from Samoa, Tonga and Fiji.

Gordon Dow

Coordinator/Senior Lecturer, Faculty of HealthScience, National University of Samoa.

Climate emergencies pose significant challenges to mental health in Pacific Island communities, where cultural ties to land and sea are deeply ingrained. Understandingmodels of psychological resilience is essential for addressing the psychologicalimpacts of climate change. This narrative review explores the applicability of traditional knowledge systems in promoting psychological resilience focusing on the *Fono Fale* of Samoa, *Uloa* of Tonga and *Yavirau* of Fiji. These models offer culturally grounded frameworks for understanding and responding to the mental health effects of climate emergencies. The primary objective of this review is to examine how the *Fono Fale, Uloa*, and *Yavirau* models contribute to conceptualisations of psychological resilience in the context of climate emergencies. By analysing literature and cultural insights, the review aims to explore the underlying principles of these models and their relevance to mental health resilience strategies. Additionally, the review seeks to examine how these models can be integrated into contemporary approaches to address climate- induced stressors. A narrative review is employed to synthesise existing literature and empirical studies on psychological resilience and climate emergencies in Samoa, Tonga, and Fiji. Peer-reviewed articles, academic publications, and grey literature will be systematically analysed using a PRISMA Proforma. Key themes and insights regarding the application of the *Fono Fale, Uloa,* and *Yavirau* models in mental health contexts will be examined. The review draws on interdisciplinary perspectives, including psychology, sociology, anthropology, and environmental studies, to provide a comprehensive understanding of resilience frameworks in Pacific Island communities. The review underscores the significance of utilising culturally appropriate paradigms to define and explain psychological resilience in Pacific Island settings. By incorporating traditional knowledge systems embedded in the *Fono Fale, Uloa,* and *Yavirau* models, practitioners and policymakers can develop contextually relevant interventions that resonate with the cultural values and relationships of Pacific peoples. These models underscore the deep connection that Pacific peoples share with their islands and oceans and offers pathways to enhance psychological resilience in the face of climate emergencies, fostering holistic responses that honour the interconnectedness of people, land, and ocean.

ADB's Floating Solar PV

Warren Evans, Melody Ovenden, Maria Melei, Cindy Tiangco, Duncan McIntosh, Lisa Blazey and Simona Achitei

The development of floating PV (FPV) in the Pacific is set to be the game-changer for the region's energy sector, transforming it to one that is climate-adapted and resilient. FPV rises with water level rise, requires no land, is least cost, quick to install, uses clean, abundant, and indigenous resources, reduces the need to import diesel and lowers vulnerability to external shocks. But this innovative technology comes with risks and challenges. FPV and the associated Sustainable Blue Economy and Productive Uses of Energy, which uses energy to increase income and socio-economic development, can provide solutions to some of the critical vulnerabilities of Pacific island countries. Harnessing FPV and marine renewable energy to address energy, food and water insecurity, climate vulnerability, mobility, and connectivity, in the Pacific would provide enormous potential for transformational innovation. ADB's floating solar plus program is developing a pipeline of cross-sectoral integrated solutions across the Pacific.

Social vulnerability informing long-term adaptation planning; findings from the Republic of the Marshall islands.

Nola Smart (Beca)

As Pacific nations progress with adaptation planning to respond to climate change, the importance of understanding the complexities and layers of social vulnerability that communities face cannot be understated. A Vulnerability and Adaptation Planning work program undertaken by Beca International Consultants Limited to support the delivery of the Republic of the Marshall Island's (RMI) National Adaptation Plan highlighted the co-dependencies and challenges that communities on urban, semi-urban and rural atolls face and how these significant social impacts can inform adaptation planning. The threats from climate change to the Marshallese way of life are widespread and varied, with no single solution to protect their social, cultural, and physical values. However, we know that Marshallese are resilient and have indicated a desire to stay for as long as possible to enable future generations to live and thrive on their ancestral atolls. At the fore of the challenge is the need to support ongoing habitation that provides for economic, environmental, social, cultural, physical, and mental wellbeing for as long as possible. This can only be achieved by avoiding the occurrence of scenarios that make the environment 'unlivable'; reaching people's limits of what they can tolerate to continue to live in situ. Key habitability limits include habitable land, provision of critical services and infrastructure, and ways to sustain themselves both in terms of livelihoods, access to freshwater and food. While land availability from sea level rise is a key limit to future habitability of the atolls in the RMI, other impacts of climate change cumulatively will challenge the livability thresholds of many members of the community and will require a change in adaptation action prior to any physical sea level rise threshold being triggered. These impacts relate not just to physical infrastructure and services but also to community connections, sense of identity, and social cohesion. Particular challenges identified in the research related to the impacts of climate induced out-migration both for individuals wanting to leave, and the ongoing community function for those being left behind. By understanding these factors we can help facilitate necessary discussions, response of relevant ministries and further strengthen communities' natural adaptive capacity to create an enabling environment for coordinated adaptation planning in the RMI and beyond.

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Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
D201	**D1-Session 8 (D1-S8)**	**Traditional knowledge and science**

Implementing SPREP's Environmental Impact Assessment Guidelines for Coastal Engineering: A Vital Tool for Enhancing Coastal Resilience in the Pacific.

Puta Tofinga & Ivan Diarra

Environmental Assessment and Planning Officer
Secretariat of the Pacific Regional Environment Programme

Responding to climate-induced challenges like sea-level rise and coastal erosion in Pacific Island nations, the Secretariat of the Pacific Regional Environment Programme (SPREP) has developed a range of Environmental Impact Assessment (EIA) guidelines. Developed most recently is the SPREP Good Practice in EIA for Coastal engineering in the Pacific which provides a technical framework for integrating sustainable coastal engineering practices and traditional knowledge with environmental conservation. The guidelines are in direct response to the impacts of climate change on coastal communities and infrastructures, and emphasize detailed EIA, particularly focusing on vulnerable marine ecosystems. They incorporate good practice methodologies for baseline environmental surveys, predictive modelling of impacts, and comprehensive monitoring strategies which are crucial in protecting key habitats, including coral reefs, mangroves, and seagrass beds. Central to the guidelines is the integration of risk assessment techniques to evaluate and address the cumulative effects of coastal engineering projects on the marine environment and vulnerable coastal communities, aligning them with sustainable development goals. The guidelines also underscore the need for stakeholder engagement and inclusive decision-making, ensuring that local community interests and traditional ecological knowledge are considered in the EIA processes. The Coastal Engineering EIA guidelines present a technical and strategic approach for Pacific Island nations to develop climate-resilient coastal infrastructure. They represent a comprehensive tool for balancing environmental responsibility with economic development needs, ensuring long-term resilience of the Pacific's unique coastal environments against climate change.The presentation provides an overview of the SPREP Coastal Engineering EIA guidelines and provides recommendations for building capacity within institutions, facilitating knowledge exchange, and fostering collaborations among government agencies, local communities, and other stakeholders to support the implementation of the guidelines

Applications of Sāmoan Traditional Knowledge for Building Modern Socio-Ecological Resilience.

Craig Shapiro

This research is focused on preliminary survey of a LiDAR dataset which reveals the Sāmoan Islands as an extensively human-modified environment consisting of systems of ditches and terraces that extend from the coast to the remote interior. This research tests the hypothesis that Sāmoa's ancient ditches and terraces were crucial components in constructing a resilient socio-ecological system in the past. Analyses may also serve as a seminal case study for documenting adaptive capacity and building long-term resilience through collective action in precontact Pacific Islander communities, other island and coastal indigenous communities, and socio-ecological systems more broadly. As a component of niche construction, these agricultural networks further benefit interconnected ecosystems by regulating water flow and controlling flooding, mitigating consequent soil saturation via effective drainage, reducing erosion, maintaining the integrity of Samoa's soil nutrients. Through the examination of the similarities and differences between three study areas in the Atua province of 'Upolu Island, this research suggests that precolonial Sāmoans not only knew how to target specific soils for agricultural production, but also recognized the importance of monumental water control features for supporting local agricultural production and maximizing crop yields. Archaeological science has undergone a revolution in the last decade due to LiDAR—point cloud data collected from airborne survey which reveals elevation changes on the ground surface. Analyses of the resultant datasets, GIS-processed imagery, and digital elevation models have allowed archaeologists to expand the study of archaeological landscapes beyond specific sites and study niche construction at regional scales with more advanced geospatial methods. In Sāmoa, LiDAR reveals networks of ditches, terraces, and other earthen- and stone-monumental architectural features throughout the entire archipelago. These precolonial planned landscapes reflect the richness of Sāmoan ancestors' traditional ecological knowledge. Such an intimate understanding of adapting to variable island environments and engineering those settled landscapes for long-term stability still serves Pacific Islander communities today. In an applied sense, revitalizing such traditional ecological knowledge and land management practices may simultaneously draw further connections to related Pacific Islander communities, promote an adaptation strategy for other indigenous island and coastal communities preparing for increasingly powerful and more frequent rainfall events due to a rapidly changing climate, indicate how these ancient features could be integrated into modern efforts to enhance climate resilient food production, and support grassroots food sovereignty initiatives.

What are the Birds and the Trees Telling Us? Early Warnings from Traditional Knowledge in a Changing Climate.

Patricia Mallam

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Climate change is emerging as the greatest threat to natural communities in many, if not most, of the world's ecosystems in coming decades, with mid-range climate change scenarios expected to produce greater extinction rates than habitat loss, currently deemed the top threat to biodiversity (Thomas et al., 2004; Malcolm et al., 2006). Although 2023 was the warmest year on record globally, it was the 3rd warmest year on record in the Western Pacific region. December 2023 was the warmest December on record, with August, September and October also warmer than their corresponding months in all previous years. 2016 was the hottest year on record for the Western Pacific. The 5 warmest years on record in the Western Pacific have all occurred over the last 10 years. Most Pacific Island countries experienced warmer than average temperatures with temperatures more than 1.2 °C in the eastern Kiribati region, associated with the 2023-24 El Nino event. Some probable effects of global warming are (a) an increase in temperatures, (b) greater warming of the ocean, and (c) an increase in the frequency of tropical storms. These changes will affect the health of flora and fauna, especially through increasing temperatures. Climate change is known to cause a wide variety of detrimental effects on biodiversity, including species loss, changes in migration patterns, mutation of pests and diseases, with potential to cause a collapse of entire ecosystems. This would also result in a loss of invaluable traditional ecological knowledge which is underpinned by the physical environment. For generations, traditional ecological knowledge has been used as a form of an early warning system for Pacific Island communities. Traditional ecological knowledge and experiences on disaster preparedness, which are rich with local warning indicators from insects, birds, trees, and other natural phenomena have been passed on through generations. Songs, dances, art and even traditional clothing narrate stories about past disasters and what the changing of seasons bring in terms of adverse weather. However, changes in climate are likely to alter natural indicators, which are crucial for traditional early warning systems. Increases or decreases in temperatures and rainfall patterns will cause a shift in behavioural and growth patterns of flora and fauna. Understanding what natural indicators mean now, and what they will mean in time to come, are crucial to appreciating existing traditional ecological knowledge and possibly transforming our use of these as an early warning system.

Evaluating Ecosystem-Based Adaptation's Impact on Enhancing Community Resilience to Climate Change: A Case Study of Alakoko Fishpond in Kauai, Hawaii.

Ann Nyambega

University of Hawaii, Manoa

Indigenous people have historically relied on nature to bolster their resilience. A recent trend advocated by such entities as the United Nations and the United States Federal government seeks to renew a focus on utilizing nature's power to help people adapt to climate change. Ecosystem-based adaptation (EbA) involves sustainable restoration and conservation strategies to harness nature's passion for human and ecosystem resilience. As this practice garners global recognition and investments, there is a need to assess its effectiveness, which enables learning, adaptation, synthesis, and localization, particularly in island contexts where unique vulnerabilities and opportunities exist. Following this, my research evaluates the impacts of an ongoing EbA, a biocultural restoration program on Kauai Island, Hawaii. The Alakoko fishpond suffered neglect, leading to the unchecked growth of invasive red mangrove (Rhizophora mangle). Malama Hulēʻiʻa, a local non-profit, took on the crucial role of restoring the fishpond. Collaborating with community volunteers and incorporating traditional Hawaiian knowledge and practices, they aspire to bring healing and vitality back to the land. Utilizing program theory, we hope to achieve the following objectives; Explore and elucidate critical elements, relationships, and interconnections in the restoration site and determine leverage points; Define outcome indicators that reflect the success of the restoration efforts in terms of community resilience and compare with existing literature on the topic; Gather evidence through rigorous data collection and analysis on the identified indicators; Synthesize the collected evidence to draw meaningful recommendations. Participatory Systems Mapping (PSM): we apply systems thinking approaches and use feedback loops to visualize the interconnections between human and ecosystem components in a system map model built through workshops with land managers and shareholders. Leverage points will be uncovered and used to build monitoring plans. Collaboratively construct a theory of change diagram and, based on the leverage points, identify indicators to measure resilience in the community. Design and administer surveys and interviews to gather credible evidence on the multi-dimensional resilience impacts of the restoration program. Utilizing appropriate methods to analyze and synthesize findings to provide a comprehensive understanding of the program's effectiveness and its contribution to enhancing resilience. Based on our findings, recommend actions and decisions that are consistent with the conclusions drawn from the evaluation. Informed by evidence-based recommendations, this study aims to facilitate informed decision-making, ensuring targeted and impactful approaches to enhance the effectiveness of the restoration program. By adapting strategies to address critical concerns and targeting interventions at identified leverage points, the program can establish equilibrium within the system. Furthermore, the study serves as a valuable baseline for future evaluations of EbA programs, providing essential insights for ongoing adaptive management and the continuous improvement of resilience-building initiatives.

Parallel Sessions | Theme – Pacific Island Developing States		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D1-Session 9 (D1-S9)**	**Communicating science**

Strengthening Access to Innovative Solutions for Resilience through the Pacific Climate Change Centre.

Fred Patison

The multi-faceted impacts and nature of climate change with increasing vulnerabilities of Pacific Island countries requires a complex adaptative and mitigation systems and solution and requires the design of new social, technical, scientific, financial, policy, partnerships, and business models. The PCCC innovation function is meant to draw on the power of "innovation". Innovation helps scope for new approaches and changes, creates new opportunities, and fosters competitive advantage to sustain climate investment. The solutions can take many shapes: from processes to using different innovative technology, to research, to scaling up of new solutions,, to taping into new sources of collaborative financing, or encouraging community engagement for need driven solutions. The PCCC vision is underpinned by four cross-cutting themes, climate science and climate services, climate change adaptation, mitigation and low carbon futures, and climate finance. These cross-cutting themes are fully embedded within the context of the key functions of the centre, which are knowledge brokerage, applied research, capacity building and innovation. The PCCC business plan defined the innovation as a creativity of thinking of something new, workable, practical, cost-effective and making it happen and focuses on turning ideas into solutions, the application of ideas that are novel, useful and relevant to the needs of our people. The PCCC hosted the first Pacific Virtual Climate Innovation exhibition on 4-6 October 2022. The PCCC will convene another exhibition in 2024 with focus on the following three key themes on Islands and Coastal Ecosystems, Climate Change and Health and Climate Smart Agriculture and Food Security. The Pacific innovation lounge will be the main virtual platform from which the exhibition will be hosted and will be launched during the innovation exhibition at the PCCC in Apia, Samoa. Innovative solutions for building resilience will be showcased during the event scheduled for September 2024. The PCCC would like to use the Pacific Climate Change Conference to introduce the Pacific Climate Innovation Exhibition, the PCCC Innovation Lounge and the PCCC-JICA Project for Innovative Solutions for Resilience to Conference Partners and participants. The conference will be a platform to promote the PCCC innovation initiatives as long-term mechanisms to promote innovative climate change solutions in the region. The PCCC will seek further partnerships to convene the exhibition but also draw on ongoing innovative solutions and ideas being promoted in the region.

Using Technology for Building Resilience and Well being in Education in Samoa to offset the challenges due to Pandemics and Natural disasters.

Ioana Chan Mow

The 2050 Strategy for the Blue Pacific Continent(PIFS, 2023) is committed to the issues of resilience and wellbeing, which are highly pertinent in the Pacific given the dynamically changing context, especially in terms of the impact of climate change, and the "importance of continuing to strengthen the capacity of the Pacific, her peoples, communities and nations to respond effectively in times of adversity, including in relation to the environment, while building and sustaining free, healthy and productive livelihoods". In recent years Samoa has faced increasing risk and vulnerability not only due to its remote geographical location, natural disasters such as cyclones, earthquakes as well as epidemics and the current COVID-19 pandemic (Government of Samoa,2020). Building resilience is also a core theme and priority in our national strategy for development - Pathway for Development for Samoa (PDS 2020). This presentation will consider technology interventions in education within the context of this drive for resilience and wellbeing in education at both the National University of Samoa (NUS) and the Ministry of Education (MESC). Initiatives include the NUS COLTEL project, NUS Moodle Implementation plan, Skills for work, SKSI national platforms, NUS and MESC multimodal delivery, NUS and MESC ICT infrastructure/connectivity upgrades and UNESCO -Japan Building Resilient schooling program. Data for this presentation will be based on a desktop review and will focus on i) key technology initiatives for building resilience and well being in education ii) barriers and challenges in implementing these initiatives, iii) results achieved and iv) lessons learnt best practices and recommendations and opportunities for using technology in building resilience in the future.

Exploring Transdisciplinary Research Methods for Understanding Circular Migration and Climate Mobility: Towards Adaptation Strategies in the Pacific Island Region.

Renata Varea

This paper highlights the importance of incorporating transdisciplinary research methods, such as causal loop diagrams, the Vanua research framework, mobility mapping and Q-sort methods to conduct nuanced research on circular migration and climate mobility in the Pacific Islands. The paper shows the steps that have been taken to test and use these methods concurrently as part of inception workshops, research training and community consultations in Samoa and Fiji under the Asia-Pacific Network for Global Research funded project titled: Moving to Remain in Place: Micro-Mobilities and Circular Migration as Adaptive Strategies to Gendered Climate Risks in Fiji and Samoa. Drawing on the experience from these workshops and trainings, we note the various strengths and gaps of each method as well as how they complement each other to better document and map the perceptions of various types of stakeholders and participants when looking at climate mobility. We emphasize that when these methods are used together, we develop a comprehensive methodology that has the potential to be more inclusive of local knowledge, social norms and cultural values when looking at the effectiveness of mobility-based adaptation strategies pertaining to climate change.

Bolstering the Pipeline of Nature-Based Solutions for Reef Health

Amy Armstrong,

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Ana Perez,

Director, Resilient Reefs Initiative, Great Barrier Reef Foundation;

Nicola Thomson,

Director Pacific Partnerships, Great Barrier Reef Foundation

Coral reefs are essential for people and planet. They are the most biodiverse ecosystem on earth, supporting more than 30% of all marine species and providing storm protection, food security, economic benefit and cultural connection for more than 1 billion people. But they are in grave danger from climate change. Nowhere is that threat more acutely felt than in the Pacific. Home to 27% of the world's coral reefs, 94% of the Pacific's 12.7m population rely on reefs for food and economic security. Coral reef ecosystems provide critical safety, food security and livelihoods to Pacific people through the ecosystem services, coastal protection and economic activities they generate. In short, they are essential for the region's resilience and sustainability. These issues are at the forefront of the region's strategic focus. PICTS have developed and endorsed a 2030 Pacific Coral Reef Action Plan, reflecting region wide consensus and an alliance of action that is focused on creating a future for coral reefs, and the people who depend on them. This Plan, combined with strong regional governance, global climate leadership, increasing funding commitments and rapid advances in scalable reef solutions are all hopeful signs. But, despite this progress, there are still major barriers to delivering solutions across the region. They include: Lack of coordinated and collaborative project design and engagement with IPLCs, government and private sector; Lack of translation of proven solutions and science to the field; Inaccessible and insufficient data; Lack of sustained, appropriate, and coordinated capacity development; Requirements, priorities, and expectations from funders out of sync with local priorities and contexts; Lack of mature project pipelines to connect with available capital. Later this year, the Great Barrier Reef Foundation (GBRF) will launch a new AUD$15M effort to respond to these barriers, and to accelerate nature-based solutions across the region. In particular, GBRF are interested in identifying projects that can help communities and governments deliver on the goals of the Pacific Coral Reef Action Plan. We aim for this session to be participatory and generative. It is an opportunity to discuss the issues that this new effort seeks to address, and for us collectively to build momentum towards a more integrated and collaborative resourcing of reef-positive projects region-wide. Please join us in discussing how we can overcome those barriers and accelerate adequate project resourcing and implementation.

Wednesday 22 May 2024

Parallel Sessions | Theme – Governance, Law and Climate Change		
Room/venue	**Session**	**Session Sub-theme**
D101	**D2-Session 1 (D2-S1)**	**Enabling Environments - Policy and Legal Framework**

Disasters as opportunities to adopt climate adaptation policies?

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Climate change is putting Pacific Island countries at increasing risk of climate disasters. Policies to help these countries respond to such disasters when they occur and to adapt to reduce the vulnerability of communities while increasing their resilience exist but have not yet been adopted and implemented enough to adequately protect these countries' communities. This paper reviews claims made by various scholars that climate disasters offer opportunities for communities to transition to more sustainable and resilient trajectories. The paper asks under what conditions do disasters offer communities opportunities to "build back better"? and under what conditions do communities capitalize on such opportunities? Disasters force communities to respond. Most communities adopt reproductive, "build back quickly," policies intended to restore pre-disaster physical, social, and economic infrastructures as much and as quickly as possible. Some, however, adopt transformative, "build forward better," policies, responding to disasters by remodeling and replacing infrastructures to better suit their community's current and future goals in light of climate change (Evenhuis et al. 2021; Siembieda et al. 2012; Manyena et al. 2011). This paper reviews the factors that influence this choice between reproductive or transformative policies (Fedele et al. 2019). I focus on disasters as opportunities to adopt climate adaptation policies that decrease vulnerabilities to, increase future alternative responses to, and improve resilience to future climate impacts. Scholars have identified numerous reasons that adoption of climate adaptation policies in communities vulnerable to climate impacts are limited, delayed, or altogether absent (Klöck and Nunn 2019; Thomas et al. 2020; Mycoo and Wairiu 2022). Given this, disasters that disrupt community social systems may "open up space" for more dramatic, larger-scale, and previously non-viable policy changes. Existing scholarship has identified theoretical reasons to expect disasters to create transformational opportunities as well as empirical evidence that factors that mean such opportunities often go "unexploited" (Mochizuki and Chang 2017; Nohrstedt et al. 2021). Reproductive, "return to normal," responses rather than transformative, "bounce forward," are the norm (Manyena et al. 2011), while "widespread improvements of governance systems" are rare (Bakema 2019). The paper identifies conditions under which disasters create opportunities, factors that lead communities toward reproductive or transformative responses, and opportunities to make climate adaptation more viable as an element in disaster responses. I present a framework to identify conditions and strategies that foster efforts by policy actors to use disasters as opportunities to promote climate adaptation policies. I focus particularly on conditions and strategies that can help communities see disasters, in prospect and retrospect, as opportunities to develop and promote transformative (rather than reproductive) climate adaptation policies.

The Importance of Fish Aggregating Devices in Ensuring Food Security in a Changing Climate.

Jeff Kinch

Food and Agriculture Organization of the United Nations (FAO)

Coastal fisheries have always been an important source of food security and livelihoods for Pacific peoples but are increasingly coming under further pressure from growing populations and associated urbanisation and the projected impacts of climate change. Across the Pacific Islands region, annual national fish consumption per capita ranges from 20–110 kg, up to five times the global average, and fish traditionally caught from coral reefs in small-scale fisheries provide 50–90 % of dietary animal protein for coastal communities. By 2035, population growth and the negative effects of climate change on coral reef fish production will create demand for an additional 75,000 mt of fish per year to feed the estimated additional four million people relative to current populations. With regards to the projected impacts of climate change, there are two major expected impacts to affect access to marine protein in the Pacific Islands region. The first is the degradation of coral reefs, which provide much of the animal-based protein required for current domestic food security. Ocean warming is already causing more frequent coral bleaching, and ocean acidification is slowing the growth of corals, resulting in less structurally complex coral reef habitats. The second major threat is the climate-driven redistribution of tuna which many Pacific Island countries depend upon heavily for revenue to fund basic services for their citizens. In the Western Central Pacific Ocean, skipjack tuna is caught most easily at the convergence of the two tropical ecological provinces − the western Pacific warm pool and the Pacific equatorial divergence. This convergence zone is already known to shift by up to 4,000 km due to El Niño Southern Oscillation events and is projected to move further to the east as the warm pool expands with increasing sea surface temperature. The resulting redistribution of tuna resources is predicted to reduce the average annual combined tuna catch from the exclusive economic zones (EEZs) of tuna-dependent PICs in equatorial waters by approximately 20 % by 2050. In recent years, the introduction of Fish Aggregating Device (FAD) fishing has helped alleviate some of the pressure on coral reef fish stocks by directing artisanal fishers to fish for inshore pelagic species on FADS, helping to ensure greater food security for Pacific peoples. Increasing the benefits of the Pacific's tuna fisheries has formally been endorsed by the Pacific Islands Forum Leaders as part of the combined Forum Fisheries Agency (FFA) and The Pacific Community's (SPC's) Regional Roadmap for Sustainable Pacific Fisheries in 2015, which is further enhanced by the United Nations Food and Agriculture Organisation's (FAO's) Blue Transformation Roadmap and Blue Growth Initiative. This presentation will provide details of the projected impacts to tuna fisheries in the Pacific Islands region as well as provide details of previous projects in relation to FAD fishing, as well as a forthcoming project 'Adapting tuna-dependent Pacific Island communities and economies to climate change' that is led by the Conservation International in association with SPC and FAO to ensure future food security from Pacific peoples access to inshore pelagic fisheries through the wider-scale use of FADs.

Framework tools for quick and effective industry-level climate risk assessments – application in Vanuatu

Carlos Carvajal (Beca)

With growing climate change impacts and constrained response capability, Pacific Island Countries and their industry sectors are in great need of understanding the climate risks they face so as to define and prioritise adaptation planning and response actions. Beca International Consultants Limited, in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP), developed a Rapid Climate Risk Assessment Framework (RCRAF) methodology and screening tool to assist five industry sectors in Vanuatu (Infrastructure, Fisheries, Water, Agriculture and Tourism) to identify, quickly and effectively, where they are most at risk from climate change. Rather than detailed risk assessments, rapid assessments are targeted for use in resource-constrained situations and use qualitative, non-technical available information to build an evidence base for identifying risks and potential adaptation measures at regional, district or local levels. The developed framework and screening tool guides users, with little or no experience in climate change, through potential direct physical climate change risks to sector-specific activities and operations, building off existing data, including the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Vanuatu Climate Futures Portal (VanKIRAP). In alignment with this existing work, the framework considers climate hazards of coastal inundation, drought, extreme rainfall, tropical cyclones, ocean acidification, marine heatwaves, and extreme temperature, and vulnerability to these hazards under a single RCP (RCP8.5) to determine present and future (present, 2050, and 2100) risk. This provides a rapid and high-level screening of climate risks that achieves the conservatism needed to identify the most significant impacts for management and decision planning. The results of the framework consist of a list of the top three climate hazards elements causing the most risk to elements (industry activities and operations) selected by user, and a list of such elements at risk ranked by their average individual risk ratings at present followed by future (2050 and 2100) average risk. Elements ranked at the top are the ones that have the highest overall risks scores affected by one or multiple hazards. Using these framework results with levels of urgency for each risk, users can then identify potential adaptation measures using the PARA (Protect, Accommodate, Retreat, and Avoid) adaptation framework for those risks that pose immediate significant threat, or, for those where there are other adaptation programmes planned or underway, that short-term adaptations could be added to.

Nurturing our Team to sail in the Blue Pacific.

Joseph Certeza

University of Guam, Center of Island Sustainability/Sea Grant
Guam Green Growth Project Coordinator

The uniqueness of us, in the Blue Pacific, is our advantage as we set course for the sustainable world. Listening to chants honoring, retracing, and reestablishing our routes once journeyed by our ancestors as the Pacific people. Guåhan is embarking on the journey to join collectively in navigating the best routes of the infinite highway among our seas of island. Within the region of Micronesia, the University of Guam & the Office of the Governor of Guam has created Guam Green Growth which is a unique extensive public-private program set to achieve a sustainable island by 2030. This initiative is collectively supported by 100 working group members from both public and private sectors of the island, which established the G3 Action Framework plan in 2021. With the numerous initiatives in the framework, creating a workforce and the next generation of changemakers has been a crucial component to our actions on the ground. Guam Green Growth and its partners have established four (4) workforce development programs. G3 Conservation Corps is a (5) month sustainable workforce development, providing training and workshops in sustainability for each of the (3) graduated cohorts. Post-graduation of this program 60% of the members were hired and others continuing education in related fields. Our Workforce development programs extend its opportunity to our island's artist community with the G3 Art Corps. Allowing space for artist to take a creative role in community engagement. It is the first Mural Fellowship Program for the island that engages (17) artists in (2) years for a (5) day intense series of workshops building their capacity to complete murals themed after the United Nation's 17 Sustainable Goals. Our programs created opportunities to engage regionally. G3 Kupu Program is a collaboration with Hawaii's Kupu Program and Hawaii Sea Grant Office, which has members in both Guam and in Saipan, CNMI that support organizations as dedicated personnel focusing on conservation applications and the collection of data. Our G3 Local 2030 Islands Network Conservation Corps program engages post-secondary students from the Republic of Belau, CNMI, & FSM coming to University of Guam and living in the UOG Residence Halls every Saturday for our sustainable workforce development program. Every journey has rough waters, especially today, it is how we navigate in the moment baring the chants as guides, the responsibility of each other on the journey, and more so the conviction of knowing who we are as pacific people to get to calm waters closer to our destination.

Climate Change Pacific Community Action and Global Impact.

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Since its establishment in Samoa in 2003, the Small Grants Programme has supported Climate Change and environment-related programmes, delivering financial resources from the United Nations Development Programme (UNDP), Global Environment Facility Small Grants Programme (GEF-SGP) to small grant projects on climate knowledge and advocacy, capacity building, financing, technology transfer, adaptation, and mitigation. Several capacity building workshops were conducted to assist applicants from local communities to fill out the applications forms, and mentoring is also provided for projects that have been approved for implementation. The SGP has provided opportunities, especially for the most vulnerable communities, to realize critical community-level activities that support sustainable development in one or more of the seven GEF focal areas – biodiversity, land degradation, climate change adaptation, climate change mitigation, chemicals and waste, international waters, and capacity development. The SGP supports national capacities and efforts to address climate change and other environmental areas with projects that can be implemented within 12 to 36 months. The proposals also have a specific gender lens to ensure that grant proposals from women's groups and women's village organizations that put the interests of pacific women and girls at the centre are also considered. This paper discusses the impact of the UNDP GEF SGP programme on the vulnerable communities in increasing their adaptive capacity to mitigate the impacts of climate change.

Inter-Pacific Islands Migration in the Context of Climate Change

Sargam Goundar

University of Otago

Pacific Island countries and territories (PICTs) have globally been at the forefront of research, media, and policy discussions on climate mobility. Despite this widespread interest, significant knowledge gaps remain in understanding the intricate nexus between migration, climate change, and development in the Pacific. This study identifies two critical gaps in the existing climate migration research landscape. First, climate migration research has thus far rarely considered 'inter-Pacific Islands' migration. Second, empirically grounded research on climate migration has predominately focused on the perspectives of people from migrant-origin PICTs, neglecting the views of migrant-receiving communities within the PICTs region. To bridge these research gaps, this study is the first to analyse perceptions of receiving communities in the context of climate-related intra-regional migration in the Pacific Islands region. Focusing on my home country, Fiji, this research explores how local communities of diverse socioeconomic backgrounds perceive the issue of (potential) climate migration to Fiji and how it (potentially) affects their lives and livelihoods. This presentation will (1) discuss the current state of knowledge about inter-Pacific Islands migration, (2) map Fiji's national policies in relation to climate migration, and (3) discuss the perspectives of local Fijian communities concerning regional climate migration. Centring inter-Pacific Islands migration, this presentation contributes a geographically nuanced perspective, rooted in local empirical evidence, to the discourse on climate migration research in the Pacific. It aims to illuminate the disparities between local realities, research priorities, and policy responses in the Pacific Islands region, contributes to decolonising climate migration research and initiatives, and adds to South-South (climate) migration research.

Reimagining the constitutional and legal definition of sovereignty in the face of climate change uncertainty.

Mele Tupou Vaitohi

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It is widely recognised that the many impacts of climate change and disasters have threaten the future of our people and the state of nations. It has impacted the small and vulnerable island nations in the Pacific that their sovereignty and legal statehood have become a pivotal issue. However, there is a growing school of thoughts that complex issues faced by states and persons as impacts of climate change including sovereignty should be provided and informed by sustainable principles, applicable rules and principles of international law. On review of these different tools and mechanism, it is clear that the best way forward is to channel these efforts into a common goal of reimagining the constitutional understanding of sovereignty in a contemporary context. The term sovereignty can be conceptually understood as the independence of a peoples as one state, is a central doctrine to international, public and trading law administration. The definition of sovereignty has been understood in light of statehood as defined in the 1933 Montevideo Convention on Rights and Duties of States (MDRDS). Pursuant to this interpretation, legal statehood applies where a nation is able to show a "defined territory, permanent population, government and capacity to enter into relations with other states". Sovereignty or legal statehood, subsequently, justifies rights of participation in the functionality of international legal bodies, alongside the law these administer. However, with devastating impacts of climate change on legal statehood and the related issues of legal uncertainty, it is time that constitutional definition of sovereignty be adapted to suit the changing times – that the definition should no longer be treated as a privilege but a right and an exercise of autonomy over issues that directly affect the people in the Pacific.

Indigenous Peoples' food and knowledge systems and biodiversity: The Pacific Action Plan for Mainstreaming Biodiversity for Food and agriculture (2024-2030).

Raushan Kumar and Francesca Mancini
Food and Agriculture Organization of the United Nations (FAO)

Pacific Island Countries and Territories (PICTs) encompass thousands of relatively small islands exhibiting unique and highly diverse ecological systems and landscapes. These islands host an array of endemic aquatic and terrestrial species of global importance and vital significance to the lives of Pacific peoples. In the last decades, social, economic and environmental drivers have exerted enormous pressure on these systems and their biodiversity. Although the need to reverse this trend is well established, progress has been modest so far, and efforts need to redouble to achieve the regional targets on nature and biodiversity loss by 2030. There is a growing realization that to address the complex, systemic challenges that are leading to the decline of biodiversity in PICTs, Indigenous knowledge needs to be valued and leveraged. Traditional and Indigenous knowledge systems in the Pacific Islands region have developed and evolved over generations to wisely manage natural resources, ensuring that their abundance is not depleted and the overall ecological balance is preserved. Through centuries of inhabiting these lands, Indigenous and local communities have cultivated an intimate understanding of their environment, acquiring unique knowledge about the utilization of endemic terrestrial and marine biodiversity. Communities are also the custodians of ancestral knowledge on the benefits and uses of medicinal plants. This knowledge pool is particularly vital in remote Pacific Islands, where access to health care facilities is limited. The pathway to increasing resilience in the agricultural sector requires the integration of these customary practices and indigenous knowledge systems with modern science and their institutionalization in policies and programmes. In 2023 FAO, in close collaboration with the Pacific Community (SPC), the Secretariat of the Pacific Regional Environment Programmed (SPREP), and the Convention on Biological Diversity (CBD) conducted a highly consultative, multistakeholder process in the region that led to the formulation of the *Pacific Action Plan on Mainstreaming Biodiversity across Agricultural Sectors* (2024–2030) (Pacific Action Plan). Over 200 national stakeholders representing the public and private sectors, community-based organizations and youth and indigenous groups were engaged in national consultations aimed to revise and update priorities, needs and gaps regarding sustainable biodiversity use and management for food and agriculture. The *Pacific Action Plan* has been endorsed at the 37th FAO Regional Conference for Asia and the Pacific. The *Pacific Action Plan* fully recognize the crucial role that Indigenous Peoples and local communities, including women and youth, play in biodiversity management and invoke gender-responsive, equitable and effective participation of the whole of society in decision-making processes. It identifies priorities for the countries, including the need to integrate into their national policy and legislation frameworks the fair and equitable sharing of benefits arising from the utilization of genetic resources, following the guidance provided by the CBD. Key actions are the mapping of indigenous and local organizations and networks active in the PICTs, the utilization of existing platforms to support exchanges, learning and sharing among and with indigenous and local communities, and the definition of legal and policy procedures associated with the utilization of and access to traditional knowledge. Countries, during the formulation of the plan, have also proposed the establishment of a community of practice for biodiversity mainstreaming, with the inclusion of traditional and indigenous leaders, non--governmental organizations (NGOs), civil

society organizations, farmer organizations and the private sector to support the implementation of actions.

Adaptation Research Priorities for Pacific Island Countries and Territories

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The Pacific Climate Change Centre (PCCC) Research Partnership Framework vision is for the PCCC to be a centre of excellence for applied research through enhanced strategic climate change research partnerships to meet the medium- and long-term needs of pacific island countries and territories. The key objectives are for engagement for partnership on research to have a clear shared vision and goal and as aligned to the key themes of the PCCC to have improved engagement of countries in delivery or research and research outputs and to contribute to national, regional, and global climate change research. To inform the adaptation priority theme of the Research Partnership the PCCC hosted at SPREP partnered with the University of Melbourne to conduct a region-wide and on-line survey to understand priorities for research on climate change adaptation. This paper will present the results of this survey, including a) respondent's views about the sectors that should be the focus of adaptation research, b) the topics that should be the focus adaptation research (for example adaptation pathways, or gender), and c) priorities for how adaptation research should be conducted (for example incorporating spatial information, or local and traditional knowledge). Results are analysed by the country, sector, and the fields of expertise of respondents. The results will be utilized to prioritise research topics for the thematic area of Adaptation to inform the PCCC Climate Change Research framework.

Can civil society organisations and faith-based organisations in Fiji, Samoa and Solomon Islands access climate finance?

Ofusina Toamua

Despite global rhetoric to increase climate finance to civil society organisations and faith-based organisations (CSOs-FBOs), little is known about how to accessible climate funds are to these organisations in the Pacific Islands. In seeking to address this knowledge gap, we posed three broad questions: 1) what type of climate finance did CSOs and FBOs obtain? 2) what barriers did CSOs and FBOs face to obtain climate finance? And 3) what innovative approaches or solutions did CSOs and FBOs use to obtain climate finance? In 2022, researchers conducted key informant interviews and focus group discussions in Fiji by House of Sarah, in Samoa by Samoa Women's Association of Growers and in Solomon Islands by Coalition of Youths for Environmental Sustainability. The study revealed that CSOs and FBOs generally pursued funding aligned to their values, priorities, and needs. None of the organisations had obtained funds from the large multilaterals such as Green Climate Fund and Adaptation Fund. Their funds were seen as poorly suited to local organisations. The main barriers to accessing climate finance were: 1) poor dissemination of information on the availability and suitability of funding sources for CSOs and FBOs; 2) overly complex donor processes and requirements; 3) insufficient capacity to write grant proposals and to manage funds; 4) poor recognition by donors of the role of CSOs and FBOs in development; and 5) difficult relationships with government and donors marked by differences in power. To overcome barriers, some CSOs and FBOs partnered with regional or global organisations with the capacity to absorb the administrative burden of writing proposals and managing grants. In other cases, CSOs and FBOs made use of professionals with experience of donors, who volunteered their time to draft or edit proposals. The policy implication of this study is clear: donors can create or inhibit equitable access to climate financing. If donors are genuinely committed to helping CSO-FBOs obtain climate finance, they should reduce the complexity of grant-making and tailor it to local context and priorities. They should also work through regional or national intermediaries o reach grass-roots organisations.

Parallel Sessions | Theme – Governance, Law and Climate Change		
Room/venue	**Session**	**Session Sub-theme**
D201	**D2-Session 2 (D2-S2)**	**Island Solutions and Private Sector Innovations & Technology**

A Clean Energy Plan for Samoa.

Nicollo Moeono

University of Waikato, Ahuora – Centre of Smart Energy Systems

In response to the adverse impacts of climate change, Pacific Small Island Developing States (PSIDS) including Samoa have developed ambitious renewable energy targets, aiming to reduce GHG emissions, while providing reliable and clean electricity to all. However, a significant research gap exists that hinders the achievement of energy targets, curtailing PSIDS from identifying appropriate methods and concepts to developing a fit-for-purpose energy plan. To overcome this challenge, this research introduces a smart energy system, which is a shift from a singular sector towards an integrated multi-sectoral approach, focusing on Samoa. This research creates several energy scenarios to identify the most cost-effective, flexible, and robust pathway towards a sustainable future. The research will anticipate the coupling of the electricity and transport sectors as the first step towards an integrated energy system. The novelty of this research consists of constructing an energy scenario that utilises a cultural framework, and a bottom-up step-change plan that involves multiple sectors and energy system levels in Samoa. This research will provide a comprehensive energy plan for Samoa; however, the approach can be replicated across PSIDS, paving the way for integrated, sustainable, and holistic energy planning.

Climate-Smart Urban Planning and Resilient Investment – Malekula and Tanna Islands, Vanuatu.

Beth Toki[1], Paul Walter[2], Fahim Tonmoy[3], George Beck[4]

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A holistic approach to resilient urban planning was demonstrated for two towns in Vanuatu: Lakatoro, Tanna Island and Lenakel, Malekula Island. The objective of the project was to support sustainable and resilient development of through Town Plans based on sound planning principles for urban growth taking, and into account natural hazard and climate risks that may impact the two locations. Our approach comprised three stages, namely: 1) natural hazard and climate change risk assessment; 2) development of risk-based town concept plans for supporting safe and orderly urban growth, considering resilience building in the context of the key climate change and natural hazard risks; and 3) identification of Resilient Investment and Development Options (RIOs) for realizing sustainable growth and economic benefits. By assessing climate change influences on risk, the town plans will help to increase resilience of these towns into the future. The town Concept Plans are intended to be a tool for future decision making, supporting town-building initiatives for individuals, groups, and institutions. They present findings in a set of simple conceptual maps and data that reveal the patterns to ensure well-informed public and private investments in the town. The subsequent RIOs seek to "join the dots", by recognising overarching patterns and identifying target opportunities for immediate investigation and action. Specifically, the RIOs summarise the major existing economic sectors and associated drivers, scrutinise their strengths and weaknesses, and identify a set of investment opportunities and projects that can foster longer-term local economic activities in a resilient and sustainable manner. The RIOs intend to support the value chain across a range of economic activities by strengthening the infrastructure and transport connections between resources (human and natural resources) and markets. Together, these tools will allow decision makers at all levels to make risk-informed decisions for future development of the two townships, which will impact the livelihoods of all communities on the islands.

New Climate Change Projections – An update from NIWA.

Andrew Tait

Peter Gibson, Neelesh Rampal, Isaac Campbell, Olaf Morgenstern, Ahsley Broadbent, Stephen Stuart, Daithi Stone, Abha Sood

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The development of updated CMIP6 climate change projections for New Zealand and extending into the Pacific Islands region, is underway. There are two streams of work: Firstly, NIWA is dynamically downscaling six global climate models (ACCESS-CM2, NorESM2-MM, EC-Earth3, GFDL-ESM4, AWI-CM-1-1MR and CNRM-CM6-1) using the CCAM climate model with a stretched grid configuration, in collaboration with CSIRO. The downscaling will generate high resolution data (12km over NZ and 25-30km over the Pacific Islands region) for the recent historic period plus three future SSP scenarios out to the year 2100. The three SSPs are: SSP1-2.6, SSP2-4.5 and SSP3-7.0. This work is one of the key actions in New Zealand's National Adaptation Plan and will be completed by June 2024. Secondly, NIWA is developing a Machine Learning AI model to downscale many more CMIP6 global models (at least 20) and extend to SSP5-8.5. This work, to be completed in 2025, will complement the dynamically downscaled projections by providing information based on a wider range of models and scenarios. This two-pronged approach is consistent with NIWA's previous climate downscaling work, but this is the first time we have extended the downscaling to the Pacific Islands region, made possible by using CCAM.

Climate Proofing Port Moresby's Urban Development: Reducing the Impact of Urban Heat Island Effect.

Samuel Awayang

Research Officer at Papua New Guinea National Research Institute

As urbanization increases in intensity and space the use of impervious surfaces for urban development also increases resulting in the Urban Heat Island (UHI) effect Phenomena. Urban Heat Island Phenomenon is where an area or metropolitan is significantly warmer than its surrounding rural area. The Urban Heat Island effect is observable in Port Moresby, the capital city of Papua New Guinea through the use of Geographical Information System and Remote Sensing technology. The objective of this research is to examine the Urban Heat Island effect in Port Moresby and recommend Urban Heat Island mitigation measures that can be implemented in Port Moresby's Urban Development Plan. To analyze Urban Heat Island effect, thermal infrared data was acquired from Copernicus Open Science Hub website and processed in Sentinel Application Platform (SNAP) to determine the radiative skin temperature of the earth's surface. Quantum Geographical Information System (QGIS) software was then used to assign geographical coordinates to the data through a process known as Georeferencing, and to convert the temperature unit from Kelvin to degree Celsius respectively. Through processing of the thermal Infrared dataset for Port Moresby, the Urban Heat Island effect was evident in Port Moresby. To mitigate Urban Heat Island effect, the use of high reflective materials (High albedo) is important. For instance, the use of thermoplastic roofing, this form of roofing reflects incoming solar radiation. Also, materials that allows liquid or gases to pass through must be encouraged. Adapting to greening city concepts is also proven to reducing urban heating. This adaptation methods include incorporating vegetation into urban development. Vegetation helps cools urban areas through evapotranspiration. Vegetation also helps filter carbon dioxide and good shades for pedestrians commuting by foot.

Accelerating Sustainable Development Goals in the Pacific Island Countries: The Role of Artificial Intelligence.

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Akio Takemoto, PhD, Head of Programme and Administration at UNU-IAS

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The Pacific Island countries (PICs) face several issues in their quest for economic and sustainable development due to their characteristic of "islandness," i.e., economic and geographical smallness, remoteness, and dispersion (e.g., Juswanto and Ali 2016; Malua 2003; UNESCAP 2006; World Bank 2021), raising concerns over the overall progress towards achieving the Sustainable Development Goals (SDGs). Notably, progress in areas related to environmental development, such as responsible consumption and production (Goal 12), climate action (Goal 13), life below water (Goal 14), and life on land (Goal 15), has been slow (UNESCAP 2021). Several studies, e.g. Galaz et al. (2021), Korwatanasakul and Takemoto (2021, 2022), Nishant, Kennedy, and Corbett (2020), and Sætra (2021), suggest that introducing artificial intelligence (AI) technology is a potential catalyst to accelerate progress toward SDGs in developing countries. They have highlighted the positive impact of AI applications in achieving SDGs globally. AI positively affects 79% of the 169 SDG targets, including 93% of environmental targets, 70% of economic targets, and 82% of social targets (Vinuesa et al. 2020). Developed economies worldwide have successfully leveraged AI to fulfil the SDGs, and developing countries are poised to follow suit. AI-enabled initiatives have demonstrated potential benefits in various developing countries, e.g. initiatives for improved urban planning, crime prevention, and health-related projects. Moreover, collaboration with international partners has created tools for monitoring and managing environmental challenges, such as plastic waste and ocean pollution. Despite the potential benefits, the PICs face challenges in adopting AI technologies. These challenges include a lack of AI preparedness and resilience compared to more developed economies. AI preparedness involves the ability to seize opportunities arising from AI, while AI resilience involves adapting to structural changes due to AI and technological disruption. Indicators such as investment in AI technologies, innovation capacity, digital literacy, human capital, and data infrastructure can gauge AI preparedness. Meanwhile, government vision, governance, ethics, digital capacity, and adaptability are proxies for AI resilience. According to our preliminary policy analysis based on the data of Oxford Insights (2021), Salesforce (2021), IIC and TRPC (2020), and OECD.AI (2021), the findings underscore that inadequate levels of AI resilience and preparedness hinder the PICs' utilisation of AI technologies to achieve SDGs. In particular, the existing challenges include 1) the business sector's underinvestment in AI, 2) the governments' deficient effort and inadequate digital capacity and adaptability, and 3) a mismatch between the public and private sectors' technology adjustment and fast-growing supply of AI technologies and their potential user pool. To respond to these challenges, governments should formulate national AI strategies for accelerating the development of fundamental AI

policy frameworks while prioritising the adoption of AI in key sectors, and these efforts must strike a balance between ecosystem developments and regulatory approaches. Governments can also boost private sector investment in AI through incentive programs, such as financial support and safe and secured cyberspace creation. Finally, these measures can be complemented by promoting education and capacity-building programmes introducing AI-related knowledge to accelerate the adoption of AI technology among the public and private sectors.

MMEL Tool.

Kimberley Worthy, Principal Consultant, Spatial Vision (Australia)

Semi Qamese, Project Manager, PACRES, SPREP (Samoa)

Sam Saili, CEO, SkyEye (Samoa)

To support community, sub-national and national planning processes across the Pacific Islands region, an online climate mainstreaming, monitoring, evaluation and learning (MMEL) decision support tool has been developed on behalf of SPREP. The MMEL tool provides resources for planners to mainstream climate change and planning in decision-making processes to ensure climate change adaptation and national development plans are implemented. Through consultation with stakeholders across 15 Pacific Island countries, requirements were captured to ensure resources within the MMEL tool support government, the private sector and communities. Resources aligned to these requirements were sought-out and made available through an online open-source tool. The MMEL tool considers the long-term vision of sustainable national development plans for the Pacific region and provides users with guidance, tools and templates for initiating, planning, managing and learning relating to climate. The outcomes of this work have allowed government, private sector and community groups to easily find and access resources relating to their climate MMEL initiatives. Having these resources available aids the Pacific region to enhance resilience building capacities and capabilities. This presentation will include a demonstrate the tool. This work was delivered for SPREP with Samoan company SkyEye, partnered with Australian company Spatial Vision.

Climate Knowledge is Power: the development and application of tools to maximize Afulilo Dam water storage for energy generation.

Molly Powers-Tora, NIWA; **Kotoni Fa'asau**, Samoa Meteorology Division

Alan Porteous[1], James Sturman[2], Molly Powers-Tora[1], Hannah Marley[1], Matt Wilkins, Kotoni Fa'asau[3,] Tauiliili Ekiumeni Fauolo[4], Leata Tangatauli[5], Emarosa Romeo[6]

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As the largest renewable power system in Samoa, the Afulilo Hydropower Scheme is central to the national goal of becoming 100% renewable in the energy sector by 2030. Efficient use of the Afulilo stored water resource helps to reduce reliance on diesel-power generation, moderate fluctuations in energy costs, and mitigate national greenhouse gas emissions. The system is administered by the Samoa Electric Power Corporation (EPC) and is highly dependent on rainfall, balanced against the need to retain storage for energy needs. To support efficient management of the Afulilo Dam, the Australian and New Zealand-funded Climate and Oceans Support Programme in the Pacific (COSPPac) has been working in partnership with EPC and Samoa's Water Resource and Meteorology Divisions to develop an operational water balance tool. The *Afulilo Water Storage Outlook Module* (*AWSOM-1*) was first developed in 2012 to quantify the effects of rainfall variability on reservoir storage volume. AWSOM-1 was implemented at the Samoa Meteorology Division (SMD) as a desktop excel spreadsheet, relying on manual data entry each month to produce a forecast of the change in reservoir storage. Over the past decade, advances in technology have enabled the upgrade of AWSOM to a modern platform. The spreadsheet has been redeveloped as a semi-automated web-based application, implemented on the CliDE and CliDEsc data management and product generator platform at Samoa Meteorology Division-- the Afulilo Water Storage Outlook Module v2 (AWSOM-2). AWSOM-2 draws on weekly, monthly, and seasonal rainfall forecast products from a range of global forecast models. Additionally, AWSOM-2 draws on rainfall observations from the dam, dam level measurements conducted by EPC and the Samoa Water Resource Division, and power generation rates. The model incorporates physical relationships derived from studies of how the reservoir responds to rainfall, water runoff from the upper catchment, and losses from evapotranspiration and seepage. As in AWSOM-1, model inputs are incorporated from on-board reference data developed in earlier studies, including interactive effects on changes in water storage level due to physical reservoir features. At run-time, input parameters can be adjusted to test a range of storage usage scenarios. Samoan Met staff operationally review model outputs, add interpretive commentary from local

knowledge and perspectives, and then forward the reservoir storage outlook report to EPC. This enables EPC to consider options for optimising water use for power generation while maintaining a guaranteed electricity supply. AWSOM continues to be tested and developed in consultation with key stakeholders and in accordance with available data, technology, and local needs.

Parallel Sessions | Theme – Governance, Law and Climate Change		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D2-Session 3 (D2-S3)**	**International law and negotiations**

Community Engagement in American Samoa.

Sabrina Suluai-Mahuka, Finafinau Founder and Executive Director
Stevie Iakopo, Finafinau National Student Council President
Matalasi Kim, Finafinau National Student Council Media Coordinator

Climate change poses significant challenges to communities worldwide, impacting various aspects of their social fabric. This abstract focuses on the *Fa'asamoa* way of life, a communal and traditional way of living in Samoa, and examines how climate change influences community engagement within this cultural context. The *Fa'asamoa* way of life is deeply rooted in communal practices, where individuals rely on strong social bonds, shared responsibilities, and a connection to the environment. These events create spaces for dialogue, consensus-building, and the transmission of cultural knowledge from one generation to the next. Methods of community engagement in Fa'asamoa involve reciprocity and collective decision-making. *Finafinau* plays a vital role in fostering community engagement by providing a platform for individuals to come together and collectively address local challenges. These clubs often serve as hubs for social interaction, and collaborative problem-solving. Through various initiatives and activities, such as community service, Finafinau contributes to the overall well-being of the community. Their impact extends beyond social connections, promoting a sense of unity and shared responsibility among members. As climate change intensifies, altering weather patterns, rising sea levels, and increasing temperatures, the *Samoan* community faces disruptions to its established norms. This study employs a qualitative approach, integrating interviews, participant observations, and community discussions to explore the nuanced ways in which climate change shapes community engagement. Preliminary findings suggest that environmental changes are not only impacting the physical landscape but are also reshaping social dynamics within the *Samoan* community. The heightened frequency of extreme weather events, such as cyclones and floods, prompts collective responses, strengthening community solidarity. However, the long-term implications of these climate-related challenges pose threats to the sustainability of *Fa'asamoa* practices. Moreover, this abstract discusses various methods employed to adapt and reduce the effects of climate change within the *Samoan* community through localized knowledge and traditional ecological practices which are essential tools for resilience, as well as sustainability. The community engages in collaborative decision-making, integrating traditional wisdom with contemporary strategies to address climate-induced challenges. The implications of this study extend beyond the *Samoan* community, offering insights into the broader discourse on climate change adaptation and community engagement. By understanding how traditional societies respond to environmental shifts, policymakers can develop more culturally sensitive and effective strategies for climate resilience. This research contributes to the growing body of literature bridging climate change science and cultural anthropology, offering valuable perspectives for sustainable development. Our objective is to delve into the multifaceted impacts of climate change on both the cultural and everyday life within our community as well as its effect on community engagement.

From Faith to Awareness to Action: Aotearoa's Religious Diversity Centre in Support of Climate Justice for Oceania.

Paul Blaschke,

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The Religious Diversity Centre Trust Aotearoa has a mission of promoting understanding, appreciation and respect for religious diversity among the religious, spiritual and secular communities in Aotearoa. For the last three years its Climate Action Group has implemented programmes aimed at awareness and action on the climate crisis that threaten people of all faiths and none. Early work was focussed on climate-related submissions with a national focus, such as New Zealand Zero Carbon legislation and urging ambitious carbon mitigation targets. Through its webpages https://rdc.org.nz/rdc-climate-action-group/, the group also worked to raise awareness among people of faith, religious leaders and organisations. Through the first half of 2023, the group worked to present a mid-year webinar series around the theme "*Building a Climate of Hope*." An outstanding group of international and Oceania keynote speakers and commentators addressed hope for the planet, for Aotearoa's future, for the Pacific region, and for our world. An ambitious programme attracted very good attendance, interest and financial support. Two significant programmes followed the webinar series. Firstly, shared viewing and discussion sessions led to effective follow-up local action in some towns, with tangible positive effects on local climate action. Secondly, following a forceful webinar talk from the Pacific Climate Warriors Aotearoa group, we acted in support of Pacific leadership in global climate justice through the international *Fossil Fuel Non-Proliferation Treaty*. Governments around the world are not taking the climate emergency seriously enough: this is what makes the voice of the Pacific Climate Warriors so important. Their advocacy has proclaimed their people not as helpless victims, but as resilient beacons of hope. Accordingly, later in 2023 we ran a national campaign for endorsement of the FFNPT among New Zealanders of faith. More than 100 faith leaders and institutions from throughout New Zealand endorsed the treaty and their signatures were sent to the international organisers. As advocates we recognise the unique wisdom of traditional knowledge among Oceania's and other Indigenous people, who have always been the guardians of the earth and oceans wherever they have lived, and we see its importance to us all today. Many religious leaders recognise the importance of this knowledge too and link it to concepts of 'integral ecology', 'cultural ecology' and 'Creation Care', articulated in Dharmic and Abrahamic religions and most recently by Pope Francis. In 2024, we will likely turn back to more effort on local community action, partly in response to an unfavourable national political environment. From our earlier work, we know that people of diverse faiths recognise the severity of the climate crisis and wish to play their parts in response. There is still crucial work to raise awareness among people and leaders and translate that into action for climate justice, both nationally and locally. Last but not least we recognise the moral

authority and international leadership of small island Pacific nations and of activist Pacific youth. This inspires us to continue our work.

The Role of Churches in Building Resilient Communities through Values, Rules and Knowledge Framework (VRK) in Fiji.

Nunia Bari

Pacific Center for Environment and Sustainable De elopement (PaCE-SD), The University of the South Pacific (USP).

Lau Dr Viliamu Iese, USP and University of Melbourne.

Human induced climate change has increasing effects faced globally, threatening livelihoods, wellbeing, and security. The IPCC (2021) report stated that the subtropical central Pacific will experience more intense tropical cyclones (Category 4 and 5), but decrease in frequency in the 21st century. Fiji is highly vulnerable to climate change, and requires adaptive strategies and environmental policies relevant to its context, which includes cultural and faith systems (Gomez and Brincat, 2021). Churches play important roles in Fiji with a wide presence in all communities (Iese et al., 2021) influencing communities' perception of climate change and disasters. The influential role of churches in communities can contribute to the action or inaction on environmental issues (Havea et al., 2018). It is important to understand the factors that help influence decision contexts in communities for resilience and sustainability. Decision contexts are co-evolving values, rules and knowledge systems (VRK) (Gorddard et al., 2016) that enables the evaluation and construction of options for building resilience. This research will be focusing on the roles of churches and faith-based organizations (FBOs) in influencing decision contexts in households and communities for actions to build disaster resilience. Given that Fiji is vulnerable to intense and frequent weather and climate extremes, it is vital to maximize and mobilize resources, implement disaster-ready plans and ensure that outcomes of resilient building projects are long-term. The IPCC report (2021) stated that there will be more intense weather and climate extremes, thus churches and communities will need to establish better decision contexts and mobilize resources for risk reduction. Currently, there is no research based on understanding the decision-making context and actions of households, communities, and churches for disaster resilience and how the church or faith-based organizations influence the decision-making contexts. The results from the case study will help understand decision contexts for resilience by households, communities, and churches. This study will show that capacities built and decisions made will benefit the community years after the completion of any project led by churches and FBOs.

Is there a role for event attribution research in Loss and Damage.

Dáithí Stone

Sam Dean, Peter Gibson, Suzanne Rosier
NIWA, Wellington, Aotearoa New Zealand

20 years ago Myles Allen, as he watched flood waters approach his kitchen door, proposed that we could actually say something quantitative about the role of anthropogenic greenhouse gas emissions in damages experienced from single extreme weather events. This founded the field of "event attribution" research, and there are now hundreds of studies of specific events as well as continual development of research methods and resources (see my other presentation!). So far the conclusions of event attribution analyses have mostly been paraded in the media, but with no specific involvement in the sort of litigation or loss and damage activities as Myles Allen initially envisaged. Nevertheless, there is quite a bit of discussion and debate within the event attribution community of how event attribution may or may not serve the emerging Loss and Damage mechanism (L&D) within the UNFCCC. This talk will review possible ways that event attribution could inform L&D activities, from strategic, to tactical, to operational levels. We will also review potential issues were it to be required in an operational capacity. This talk is intended to start a discussion within and after the conference on if and how event attribution could support L&D activities.

Launch of the Otin Taai +20 Declaration: Stories, Reflections and Aspirations on Ecological Stewardship and Climate Justice by Pacific Churches.

Bedi Racule and James Bagwan

The Otin Taai Declaration of 2004 in Kiribati andMoana Declaration of 2009 in Fiji ushered in the prophetic role of Pacific churches to engage with the devastating impacts of climate change and climate induced displacement and relocation. 20 years on from the Otin Taai meeting, the Pacific Conference of Churches will reconvene Pacific church leaders, climate witnesses and other stakeholders on 6-9 May of 2024 for the Otin Taai +20 Conference. This meeting will be an opportunity to commemorate the monumental journey of environmental leadership by the Pacific Household of God and enable their recommitment to climate action through regional and ecumenical collaboration. PCC proposes for a session at the Fourth Pacific Climate Change Conference to: Launch the outcome statement from the Otin Taai +20 Conference, detailing stories, reflections and aspirations on ecological stewardship and climate justice by Pacific Churches (Note: the name of the outcome statement is subject to be determined by the Conference and may change from "Otin Taai +20 Declaration."). Spark dialogue/talanoa on the role and prophetic voices of churches and faith based organizations in climate action. Combine theology with indigenous values and experiences to confront the dominant economic paradigms which have resulted in economical, ecological and ecumenical discordance. This session will be based on Talanoa methodology. The implications for this session are that participants will be able to Highlight faith and community led approaches for pastoral, practical and prophetic climate action. Inform the work on ecological stewardship and climate justice from faith-based and indigenous perspectives, leading to holistic climate action and solutions. Forge pathways and multi-stakeholder collaboration between communities/churches and public and private sector, CSOs, international partners and other stakeholders.

Laudato Si Mandate approach to Climate Change: a case study in Samoa.

Sr Vitolia Mo''a[1] and Dr. Maria Kerslake[2]

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Walk your Land "a sustainable development project to protect the environment and its biological ecosystems that supports biodiversity whilst promoting sustainable livelihoods for local people and enhancing their resilience to Climate Change. The project committee started the project on the 1st of December 2022 as a continuation of the work that was established through the Laudato Si mandate by Pope Francis. One of the areas the Ladato Si focuses on is the disproportionate effect of environmental change on the poor and on the developing world. The pope states that focus on the poor is one the central themes of the encyclical, and he provides many baneful examples of the effects of climate change, whose "worse impacts" are felt by those living in the developing countries for example Samoa. SMOGA 64 established the project proposal to the UNDP GEF Small Grants Programme (SGP) with grants to assist in the fulfilment of their stance in protecting the environment, by maintaining biodiversity, and mitigate against impacts of Climate Change. This paper will discuss the progress of activities for the project which includes the initial five communities where the project was implemented with practical actions to adapt to the impacts of Climate Change. The paper will also discuss upscaling of actions for future partnerships and grassroots movement.

Adum! Where are you? A call for a public Faifeau in response to Climate Change.

Sam Amosa

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Pacific island nations are amongst the most vulnerable to our ever-changing climate, with many currently facing higher temperatures, changes in rainfall patterns, rising sea levels and changes in the regularity and intensity of life-threatening climate incidents. Accordingly, everyone is called to act in response to the issue of climate change. While schools, institutions, civil societies and citizens have all played functional roles in responding to climate change, the position of the church (or *faifeau*) is noticeably absent. This paper therefore appeals to *faifeaus* to play their role as prophetic voices by becoming public *faifeaus* to speak out and about the issue of climate change in the public space of Samoa and the Pacific. Put simply, there ought to be a public pulpit, where the *faifeaus* need to be involved beyond the confinements of church buildings, their church responsibilities and be mobile in the public space to collaborate with government, non-government, educational institutions, policy makers and its people to address the issues of climate change.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
D101	**D2-Session 5 (D2-S5)**	**The Future is Here**

Why is it important to teach Pacific students to ask questions today?

Thomas Hukahu

Fiji National University (Department of Communication and Media)

Students attending schools, colleges and universities in the Pacific are said to be usually quiet in class. Additionally, they do not ask questions in relation to a concept discussed in a lesson or lecture when time is given for them to do so. Is that not what you, educators in the Pacific, are observing? This paper draws examples from some observations made in different situations and classes in universities in the Pacific and Australia over 30 years and give reasons, with support from articles by other educators, why students in the Pacific need to be taught to ask questions and develop that skill to better prepare them for the future where some of their careers may require such skills. The paper also states that the challenging times the island states are in demands that people, old and young, must ask questions to receive answers to assist them in their preparation to better address issues like Climate Change, pandemics and dumping of waste into their sea. The paper emphasises that even though traditional cultures may have taught young people to remain quiet and accept most of what the big men or women tell them, they must change that mentality when entering today's modern classroom. They must develop their questioning skills, which are vital skills, and the paper urges teachers and lecturers to review their teaching strategies to plan and facilitate for lessons where students are given opportunities to develop such skills regularly.

Pacific Carbon Effect: How carbon intensive are construction aid projects in Samoa?

Ryan Simpson, Robyn Phipps, Robin Skinner

Wellington School of Architecture, Victoria University of Wellington, New Zealand

Low carbon buildings are necessary to ensure all developed countries meet their commitment to the Paris Agreement of limiting the increase in global average temperature below 2 degrees Celsius above the preindustrial levels. Developing countries such as those in the Pacific Islands struggle to construct good quality infrastructure let alone low carbon buildings because of their capability, geographical isolation, availability of good quality materials and financial constraints. Donor countries such as New Zealand, Australia, Japan and China fund these aid projects from design to construction in their support of developing countries. The design stage becomes a vital check point to determine the size of the building and the quantity of specified materials. The majority of materials in construction aid projects are procured from overseas, and are frequently sourced from the donor country, with transportation over long distances creating a significant increase in carbon footprint. A research project has commenced to conduct a Life Cycle Analysis (LCA) methodology of the superstructure for a new educational building located in Faga primary school in Western Samoa funded by JICA. The framework will build on traditional LCA approaches and include an examination of durability and maintenance requirements in a harsh maritime tropical climate, and the carbon footprint specific to the unique elements to the Pacific Islands. The aim of this research is to quantify the carbon effect in recent Pacific aid projects and identify strategies to achieve climate resilient projects in the Pacific Islands with a focus on carbon reduction.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
D201	**D2-Session 6 (D2-S6)**	**Partnerships: Climate change is everyone's business**

Climate change and its diplomatic impacts in the Blue Pacific: a necessary – or post(neo)colonial – evil?

Eric Frécon

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Besides the critical impacts in terms of human security, climate change can also affect the national and regional diplomacies. At the bilateral level, firstly, it is worth seeing how Tuvalu signed a strong agreement with Australia primarily because of its climate refugees in a near future. However, some other states are still more concerned by short-term priorities (infrastructure, investments, soft loans), without any specific questions regarding durability and environment. That said, as another option, beyond the rising bipolarisation between China and the USA (or AUKUS and the Partnership in the Blue Pacific – or PBP – more generally), climate change could push PICs (Pacific Islands Countries), away from these spheres of influence, towards none of these two poles but middle-ranked powers, which have more to offer in this field rather than in terms of money or hard security. For instance, environmental security is one of the key pillars of the French Strategy in Indo-Pacific in general and in the Blue Pacific in particular. Similarly, the European Union (EU) Global Gateway aims to primarily fund eco-friendly projects. Last example: India, which also promotes multi-alignment and an inclusive Indo-Pacific, multiples offer for solar infrastructure in Pacific Islands Nations. In this context, will climate change facilitate a hypothetical and so-called "third path" or "third way" across the Pacific diplomacy – together with 'partners' instead of ('benevolent') 'hegemons'? At the regional and multilateral level, secondly, climate change could be a more decisive driver. It not only gives a unique opportunity to update the definition of security in the main official documents and strategies. It could also promote a more 'Pacific' or 'insular' regionalism, based on the very active Pacific Small Island Developing States (PSIDS), made up of the Pacific Islands Forum (PIF) members… minus Australia, New Zealand and the two French territories. Does it follow the same trend as in 1970, when Pacific islands created the PIF, alongside the South Pacific Commission (which included Western powers)? In the shorter term, climate change could help promote a proper regional and insular centrality, around the 14 small PICS, as well as the fight against communism and the economic crisis contributed to the idea of an ASEAN (Association of Southeast Asian Nations) centrality. This is the reason why the PIF secretariat in Suva is working on similar mechanisms, to deal with partners and great powers without losing its own agency. In conclusion, as Professor Bertrand Badie said in his 2018 book entitled *When the Global South reinvent the World*, climate change could emerge as a key diplomatic leverage for the PICs. He called for a new definition of the 'power', as these micro-States

could eventually take a post-colonial lead – knowing that, meanwhile, the Great powers show domestic weaknesses and are stuck in an obsolete 'Cold War 2.0'. Furthermore, the PICs could subsequently decide for the agenda in global affairs and world fora, with an increasing focus on environment. (Diplomatic) work in progress: to be continued…

Community resilience to climate change and disaster risk – how do we know what success looks like?

Anna Gero, Tazrina Chowdhury, Keren Winterford – University of Technology Sydney, Institute for Sustainable Futures (UTS-ISF)

Christine Lemau, Paulini Vakacegu, Ilimeleki Kaiyanuyanu– Adventist Development and Relief Agency (ADRA) Fiji

Climate change is an immediate and existential threat for countries across the Pacific region and continues to cause significant adverse impacts on communities. Diverse investments are being made that aim to strengthen resilience to climate change impacts at community level. Whilst there is a growing field of literature which defines resilience, there is limited understanding of how best to assess whether resilience is actually being strengthened through the monitoring and evaluation (M&E) of resilience investments. This presentation explores the 'what and how' to assess resilience investments, with a practical focus on indicators to monitor change from the lens of the impacted communities. The presentation will be of interest to communities, civil society organisations, governments and development partners. Researchers from the University of Technology Sydney, Institute for Sustainable Futures (UTS-ISF) and Adventist Development and Relief Agency (ADRA) Fiji, undertook empirical research with a Fijian community in 2023, aiming to learn about monitoring and evaluating community resilience through the application of the UTS-ISF Community Resilience Framework. Drawing on the framework, UTS-ISF and ADRA Fiji researchers co-designed appropriate processes to learn about how to monitor and evaluate community resilience using participatory activities with diverse community members. Findings from the research demonstrate that defining what success looks like, and designing indicators to monitor and evaluate changes in community resilience, requires a bottom-up process based on the locally contextualised definitions and diverse perceptions of resilience. Community members themselves need to be involved in designing indicators to measure changes in their own resilience. Based on research findings, this presentation describes five key principles to guide context and project specific indicators that measure changes in community resilience. We describe how to put these principles into practice, and provide examples of indicators across the five elements of the UTS-ISF Community Resilience Framework. The insights from this research have implications for the multiple and diverse stakeholders working on community resilience programming across the Pacific. M&E of resilience programming offers an opportunity to bring multiple actors together for shared commitment and collaboration to build resilience through a common language and transparent way to track change over time. Locally defined indicators places communities at the centre of resilience programming and enables communities to be the owners of M&E and learning, which can be utilised for continuous resilience building. The key principles and process described in our presentation is intended to be adaptable for others working to strengthen resilience of communities in the Pacific. This multidisciplinary conference aims to bring together diverse perspectives and knowledge to address the pressing issues of climate change in the Pacific region. With a focus on adaptation and climate resilience building in the Pacific region, we seek to foster collaboration, locally led and locally informed adaptation and innovation for a more sustainable future.

Opportunities for Strengthening Climate Knowledge Brokerage and Informed Climate Decision-Making in the Pacific Islands Region.

'Ofa Ma'asi-Kaisamy, Manager, Pacific Climate Change Centre, SPREP
Mr Henry Tufah, Deputy Director, Climate Change Division, Ministry of Environment Climate Change Disaster Management and Meteorology, Government of the Solomon Islands
Seona Meharg, Sustainability Pathways, Environment, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Government of Australia
Rachel Nunn-Crichton, Technical Advisor, Information, Knowledge Management and Brokerage, Pacific Climate Change Centre, SPREP

The Pacific Climate Change Centre (PCCC), hosted the Secretariat of the Pacific Regional Environment Programme (SPREP), was established in 2019 and is the regional Centre of excellence for climate change information, research, capacity building and innovation. Through the Knowledge Brokerage function at the PCCC, the overarching goal of recently endorsed PCCC Partnership Framework for Knowledge Brokerage is to *ensure that Pacific Governments and Stakeholders receive timely, robust information in user-friendly formats that will support informed decision-making and climate action*. Climate knowledge brokers play a key role in information dissemination as well as tailoring and synthesising climate information for actionable use and decision-making – All encompassed along the Knowledge Brokerage journey. In the Pacific, the term '*Knowledge Brokerage*' is fast becoming realised, however, the concepts behind it are ingrained our ways of life, our interactions with others, and our connections to '*home*'. This event will showcase the outcomes of two sub-regional workshops on knowledge brokerage for each of the three Pacific sub-regions, as well as a national workshop held in the Solomon Islands all held in 2023, where specific priorities, gaps, and opportunities were shared. Capacity Building on Knowledge Brokerage has been identified as one of the biggest priorities, therefore, the partnership with CSIRO and APCP in terms of the co-development of the Knowledge Brokerage Support Program (KBSP) Manuals and open learning course on the PCCC E-learning Platform will be showcased as key products and resources for decision-support in the Pacific region.

Addressing the Adaptation-Finance Gap: Pathways for the Green Climate Fund in the Pacific.

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The Green Climate Fund (GCF) seeks to balance mitigation and adaptation financing to promote a 'paradigm shift' towards low emission and climate-resilient development pathways in the Global South. Yet, as climate change impacts become more severe, the gap between adaptation needs and climate finance is increasingly evident. This is nowhere more apparent than in the Pacific, which is extremely vulnerable to climate change. This paper first identifies the recent structural innovations the GCF has incorporated to prioritise the needs of recipient countries, while highlighting the ways in which accreditation requirements for direct access and enhanced direct access modalities continue to limit connections with local stakeholders. As a result, the GCF continues top-down programming and project processes that do not serve the most vulnerable Pacific communities. The paper then develops a framework for evaluating small scale climate adaptation project financing, drawn from Community Based Adaptation (CBA), which can be applied to design and evaluate the effectiveness of funding windows for small-scale climate adaptation project financing for vulnerable communities in the Pacific. Using the metrics for success identified in the CBA literature, we examine four GCF cases to make recommendations for constructing a new funding window that would enable the GCF to finance a greater volume of small grants for climate adaptation for vulnerable communities in the Pacific.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D2-Session 7 (D2-S7)**	**Climate Displacement and Security Law as a tool for change**

Fostering Resilience and Justice in Climate Migration.

Samantha Velluti,

Sussex Law School, UK

The proposed paper looks at the nexus between climate change, migration and development, with a focus on the normative gap in the international protection regime for climate-induced human mobility, which has important human rights implications. Recognising the legal status and protection of affected individuals who are forced to move emerges as both a moral imperative and a practical necessity. While the connection between climate change-related disasters and displacements has long been acknowledged and widely discussed there is still a legal void with no decision – neither multilaterally or regionally– to grant climate displaced persons any special status. In addition, there is no international body that is specifically entrusted with assisting and providing for climate displaced persons. The starting point of the paper is that while migration is impacted and driven by climate change, migration can be an important adaptation strategy to the climate breakdown. Conceiving migration as adaptation becomes part of a broad set of sustainable development tools and measures to address various forms of migration and displacement which take place in different settings and contexts. The paper draws on an ecological ethic of care to take into account the relational configurations between the environment and local communities (Holder & McGillivray 2020), and climate change ethics to show how decisions concerning climate change are moral issues and involve value judgments (Somerville 2008). It also builds on the principle of Common Concern of Humankind (CHH) as first adopted by the 1992 UN Framework Convention on Climate Change. Considering climate-related migration as CCH (Cottier & Losada 2021) provides the foundation for establishing an international framework of cooperation between countries with legal obligations stemming from the UN Sustainable Development Goals SDGs (such as SDG 6 on Clean Water and Sanitation, SDG 7 on Affordable and Clean Energy, SDG 13 on Climate Action and SDG 15 on Life on Land), including duties to act and compliance, thereby promoting coherence and helping devise apposite mechanisms and effective national practices to support both sending and receiving communities. By bringing together socio-ecological resilience, environmental justice and climate adaptation (Wenta, McDonald & McGee 2019) it is possible to design and implement resilient and just climate migration rules. The UN 2030 Agenda for Sustainable Development, which outlines these SDGs and related targets, explicitly acknowledges the importance of integrating migration into development strategies. The main argument of the paper is that integrating migration into environmental and sustainable development policies helps to tackle the problems generated or aggravated by the effects of changing climates and migration flows. At the same time, it helps to address the normative gap in the international protection regime for climate-related migrants.

The Climate Adaptation Research Programme (CARP): Developing local research capacity and capability within the Pacific region.

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The Climate Adaptation Research Programme (CARP) promotes a new generation of applied climate adaptation research with a focus on building a strong collaborative network of academic partners to support emerging scholars and young professionals working in the climate adaptation and disaster risk reduction knowledge domain. The programme is guided by key objectives, including: Collaboratively extending and embedding research capacity within the Pacific region to accelerate understanding and management of climate change-related disaster risks. Fostering a research environment through engagement and collaborations with university institutions to mentor and nurture a new generation of university researchers and postgraduate students. Providing policymakers, development organizations, and donor agencies with improved scientific and research-driven knowledge on climate adaptation and disaster risk reduction that can inform public decision-making and development programming. While most of the globe is vulnerable to climate change and its associated impacts, Pacific nations are disproportionally more at risk than most to a diverse range of hazards that are induced or exacerbated by changing climatic conditions. Despite most Pacific governments and development agencies widely acknowledging the need to invest in strategies and actions that reduce the impacts of changing climatic conditions, they are constrained by a lack of data and knowledge generated locally. Consequently, it is critical that research and knowledge creation on climate change and disaster risk reduction at local and regional levels be prioritized and supported. Such knowledge will augment and strengthen the capabilities of at-risk communities, policy and decision makers and other stake-holders to collectively enhance climate change adaptation, resilience, and sustainability. This project will specifically focus on collaborative engagement with three Pacific universities and other national and regional stake-holders, to collectively advancing these partners' internal institutional capacities and arrangements for climate change adaptation research. It also seeks to further strengthen research and support indigenous knowledge teaching/capacity development to advance climate adaptation and disaster risk/development research. This includes building and nurturing new research capabilities that draw on local and traditional knowledge. In addition, the project foresees unlocking and creating climate change adaptation research implementation opportunities through multiple avenues (e.g. postgraduate student research, applied research for emerging researchers, and collaborative studies with other partners). These include community-based and civil society organisations, local and national authorities, as well as regional and international agencies. Funding resources will support peer-development, and several online webinars and in-person workshops will be held to assist. CARP is supported by the United States Agency for International Development (USAID) through its Bureau

for Humanitarian Assistance and is co-managed by the Humanitarian Assistance Technical Support initiative at the University of Arizona. Core to the CARP programme is the development of a sustainable collaboration that can support emerging and early-career climate science scholars, as well as strengthen higher education institutions to assist and nurture these scholars throughout their academic journey and beyond. These young and emerging researchers and professionals, as well as their host institutions working across fields related to climate change, disaster risk, and resilience, are a critical resource in tackling climate change-induced challenges. CARP constitutes an effort to mobilize this potential and empower this emergent generation of researchers, whilst building the institutional expertise and capacity to maintain, enhance, and grow this capability.

Science-based climate information services informing sectoral adaptation planning and associated decision-making in Vanuatu (Van KIRAP).

Sunny Seuseu[1], Moirah Matou[2], Nathan Eaton[3], Leanne Webb[4], Kevin Hennessy[5], Savin Chand[6], Kate Morioka[7], Rebecca Gregory[4] and Geoff Gooley[4]

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[7]Kate Morioka Consulting (consultancy)

A key outcome of the GCF-funded project *Climate Information Services for Resilient Development in Vanuatu* (Van KIRAP) has been the development of a new sovereign climate risk capability for Vanuatu, featuring a comprehensive new portfolio of science-based climate information services (CIS). These CIS are tailored to meet the priority needs of target sectors at national and sub-national (provincial/island) scale, and are specifically designed to inform adaptation planning, climate-related disaster risk management and associated decision-making relevant across current and future (multi-decadal) climate change timescales. A variety of open-source, multi-hazard analytical methods and delivery formats have been utilised by the project, leveraging combined scientific expertise, local knowledge and user-friendly cloud-based digital technologies to deliver the CIS products. These include updated national/sub-national climatologies for a suite of climate variables (viz. temperature, rainfall, sea level rise, tropical cyclones and drought), analysis of coastal hazards related to sea level extremes and coastal inundation, ocean acidification and marine heatwaves, multiple case studies demonstrating sectoral application of the new CIS products, and a new cloud-based digital platform for real-time accessing visualised and spatially-referenced data, information, real-time and 'pre-packaged' analytics, and related CIS communication/knowledge brokering collateral such as fact sheets, brochures, videos, guidance materials etc (Vanuatu Climate Futures Portal: https://vanclimatefutures.gov.vu). The deliberate 'science-informed, user driven' approach to project co-design, and participatory governance and technical implementation across a consortium of collaborative, multi-disciplinary partners, is intended to facilitate a tangible and sustainable on-ground impact pathway for Van KIRAP underpinned by new in-country capability and capacity. In this context the project has provided a new technical benchmark for climate action in the Pacific, and a compelling case for ongoing investment in Pacific climate 'science informing services informing decisions'. This presentation will provide a brief overview of the scope of work, key learnings, achievements and next steps for the Van KIRAP project, including an introductory 'walk-thru' of the new Vanuatu Climate Futures Portal functionality.

Using randomised control trials to evaluate climate change response options.

Paul Dargusch

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Randomised control RCTs can be used to evaluate the effectiveness of a policy or practice intervention. Randomisation reduces bias and provides a rigorous tool to examine cause-effect relationships between an intervention and outcome. This is because the act of randomization balances participant characteristics (both observed and unobserved) between the groups allowing attribution of any differences in outcome to the study intervention. This is not possible with any other study design. We often have many options to choose from when responding to climate change. The Government will often have various policy options that could be implemented. RCTs provide a rigorous cost-effective way to choose between these alternatives. If RCTs show that one policy option can be effective in realizing its objectives, this provides evidence to justify rolling out the policy on a broader scale. Experimenting with RCTs represents an opportunity for countries like Samoa to be an exemplar for their Pacific Islands neighbours in how to design policy. When RCTs are implemented in areas touching on climate change, they potentially produce a double dividend - an opportunity to be a regional leader in policy design and reinforce leadership addressing climate change. In this presentation I will review a few examples of how RCTs can be applied to evaluating climate change response options.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
D101	**D2-Session 9 (D2-S9)**	**Women and Climate Change**

Measuring the connections between Gender and the Environment in Samoa and the Pacific.

Mele Maualaivao

SBS, MWCSD, CSO rep, and UN Women

The objective of this session will be to showcase the key findings from the first Gender and Environment Survey in Samoa along with findings from the survey conducted across the Pacific (Tonga, Kiribati, and Solomon Islands) with the intention to trigger conversation with policy makers about possible responses to the issues highlighted by the data. The session will be an opportunity to formally release the survey report and highlight key findings around the gendered effects of climate change, women's and men's contributions to climate change mitigation and adaptation, women's and men's roles in environmental conservation and degradation, and their different levels of participation in environmental decision making in Samoa and the Pacific. The session will also be an opportunity to highlight the unique experience of Samoa with the implementation of this survey, as one of the first countries globally to conduct it. The survey is unique in the sense that, for the first time, environment data is collected from a gender perspective, with a gender-sensitive sampling strategy, and with targeted questions to capture gender differentials within and between households. The event will bring together statisticians, policy makers, Civil Society, and other experts to discuss the findings and identify potential solutions to put in place in Samoa and regionally to respond to these gender challenges. The event is planned as a panel discussion with a moderator. Discussants will represent UN Women, SBS, and MWCSD. Their insights into the data and related policy responses are expected to ignite conversation in this regard, as a first step to finding solutions to tackling the effects of climate change from a gender-sensitive perspective.

Participation of women with disability in disaster and climate resilience building in Fiji.

Metuisela Gauna

Research Assistant for USP Pacific Ocean and Climate Crisis Assessment Project & Part-time research assistant for the UN Women consultancy at NDMO led by: Dr. Sainimere Veitata on women leadership in disaster and climate resilience in Fiji. University of the South Pacific.

Fiji's journey towards attaining sustainable development remains at risk due to disasters and climate-related effects. Among the objectives that the island nation aims to prioritize and integrate is goal number 5 of the SDGs, which focuses on achieving gender equality. The Asian Development Bank's 2022 report on women's resilience in Fiji emphasizes that while the country has made commendable progress in promoting women's rights and gender equality, persistent disparities persist and hinder women's capacity especially those with disability, to enhance their resilience against escalating climate and disaster risks. This research aims to investigate the significance of involving women with disabilities in the process of enhancing disaster and climate resilience in Fiji. It will explore how their active participation and perspectives can play a vital role in assisting the government to develop gender policies that are comprehensive, fair, transparent, responsible, and above all, sustainable. A total of thirteen publications were analyzed to gain a comprehensive understanding of the gender and social inclusivity landscape in Fiji, with a specific focus on Women with disability perspective. These publications, which encompass materials from government entities, non-governmental organizations, and development partners, shed light on the context, findings, gaps, and implications related to gender and social inclusivity. The primary emphasis of these works is on advocating for the involvement of women with disabilities in disaster and climate resilience building initiatives within Fiji. Based on the findings, it is evident that there are significant gaps in the participation of women with disabilities in disaster and climate resilience building. One of these gaps is attributed to cultural norms that prioritize male dominance in decision-making and participation in discussions, particularly in the context of disaster and climate resilience. This norm undermines the valuable experiences and knowledge that women with disabilities bring to this field of study. Another major barrier is related to health issues, which further hinders their participation in disaster and climate resilience building. Non-disabled individuals often perceive including women with disabilities in discussions related to this field as futile due to these health barriers. However, such exclusion can be seen as a violation of their human rights. Moreover, the budgeting process poses another obstacle, as the unequal distribution of financial resources hampers the involvement of women with disabilities in the field of disaster and climate resilience. In order to address these concerns and promote the participation of women with disabilities in disaster and climate resilience efforts, it is crucial to implement gender-responsive actions that cater to the needs of individuals with disabilities. This includes the creation of targeted initiatives that facilitate the meaningful engagement of women with disabilities in policymaking, development planning, and budgeting processes related to disaster and climate resilience. Additionally, it is important to prioritize capacity building, tailored support services, and establish close collaborations and partnerships with disability organizations. By doing so, we can ensure a safe and inclusive participation of women with disabilities in disaster and climate resilience activities, while simultaneously fostering transformative and sustainable development in the country.

Migration, poverty and gender issues in the face of climate change.

Janet Oge

Solomon Islands has high vulnerability to natural disasters resulting from disaster recurrence, severity and scope, environmental degradation and risk of climate change impacts, in comparison to other Pacific nations. Disasters typically pose heightened risk to women and Girls. Global evidence indicates that women are generally disproportionally affected by disasters and have different and uneven levels of resilience and capacity to recover. women experience significant gender inequality, lower socio-economic status compared to men, lower access to paid employment, lower access to information and early warnings, less control and access to economic resources and high levels of sexual and gender-based violence. Yet, women and girls are often first responders in crises and, when given the opportunity, have capacities to lead in disaster preparation, response and resilience building. Gender inequalities that limit, women's access to financial resources, land, education, health and other rights and opportunities also limit heir capacity for coping with and adapting to climate change impacts. Women's unequal participation in decision-making processes and labor markets further compound these inequalities and prevent them from fully contributing to climate-related planning and policymaking, and implementation. Systematically addressing persistent gender gaps in the response to climate change is one of the most effective mechanisms for building climate resilience and reducing emissions. The current economic system and the related business practices, production and consumption and governance systems are influencing poverty. Indeed Solomon islands vulnerable to the coastline erosion hazards and already we are victim of climate change. Village face different natural hazards that negatively impacted with resulted in the community building stone walls to prevent the sinking of their islands. The increased impact of the climate change severely affected the island. As a result, the community decide to relocate to the mainland for safety reason from the restless sea. Relocating to the mainland is quite challenging for people in many affected villages. But they have to fit in to stay in land. Most Villages build sea wall to protect their community against coastal erosion.

Improving the Selectivity of a Traditional Stone weir (Ere Ere) Design in the Solomon Islands.

Serema Kwato'o

A traditional stone trap fishing method involves using rocks and stones to create a barrier in a body of water that traps the fish restricting escape once passed through. This allows the fisherman to catch fish in the area behind the weir. The study was executed to understand how the traditional stone trap could be improved to increase the effectiveness and sustainability of fishing practices. By incorporating modern knowledge, the hope was to find ways to increase the catch, while also protecting the environment. Since traditional fishing methods such as the stone traps aren't as efficient as modern fishing gear, locals who rely on them for their livelihoods have had to switch. Because of that, local communities can't preserve their cultural heritage because they've lost traditional knowledge and skills. Interviews and observations were conducted to acquire essential knowledge significant to understanding the stone weir fishing method. The result shows that stone trap fishing method is unselective because it captures both large and small fish, as well as other organisms, indiscriminately. It also causes destruction to the corals and the environment because it requires the construction of large stone walls that can disrupt the balance of the coral reef ecosystem. Nevertheless, documentation of the stone trap fishing method helps to ensure the accuracy of the research findings, by providing new ideas on the design allowing fishers with more efficient and cost-effective ways to use this traditional method sustainably. This makes it attractive to fishermen and provides them with more incentive to use the method. The fishing method is more advantageous with the new ideas that have improved it in terms of cost efficiency and effectiveness and sustainability. However further research is necessary for deeper understanding via collecting data from a larger group to better articulate the entire fishing process from various viewpoints.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
D201	**D2-Session 10 (D2-S10)**	**Tusitala: The Storyteller**

The Power of Pacific Stories: Resilience in the Narratives and Poetry of Creative Writers of the Pacific.

Sina Vaai

Epeli Hauofa and Albert Wendt with their seminal essays on the importance of Pacific writers telling their own stories initiated a creative body of work that empowers Pacific islanders, encouraging them to claim centre stage in our region and refuse the marginalization and belittlement of the colonial and post-colonial past. These insider perspectives have gained momentum with the call for a New Oceania and the interconnectedness of Our Sea of Islands within the garland or ula of the Blue Pacific. These ties or relationships remain stronger than ever. They have been accentuated as the climate change crisis worsens and the calls from the latest global meeting COP28 focusses on loss, damage and compensation for those countries falling under the SIDS umbrella, especially here in our Pacific homelands whose risk of survival is debated with each recent severe weather event. However, despite the sense of uncertainty, crisis and conflict after COVID, Pacific creativity flourishes in text and performance of various genres. This creativity is fueled by shared Pacific values of faith, hope and *alofa* or *loloma*, charity at its most ideal in the love of neighbour and family as well as compassion for our common home, the earth and oceans as Laudato Si so aptly puts it. This paper examines, analyses and discusses the resilience of Pacific islanders in the literary representations of selected contemporary Pacific writers whose narratives demonstrate the power of Pacific stories in the spiral of the *va*, circling from the past into the present and going forward with confidence into the future.

Reimagining Knowledge Sharing, Informed Decision-making, and Anticipatory Action in the Pacific.

'**Ofa Ma'asi-Kaisamy**, Manager, Pacific Climate Change Centre, SPREP
Kristina Fidali, Solomon Islands Country Coordinator, Pacific Bioscapes Programme, SPREP
Theresa Fidow Pese, Principal Media and Communication Officer, Ministry of Natural Resources and Environment, Government of Samoa
Joseph Certeza, Guam Green Growth Project Coordinator, University of Guam

The Pacific Climate Change Centre (PCCC), hosted the Secretariat of the Pacific Regional Environment Programme (SPREP), was established in 2019 and is the regional Centre of excellence for climate change information, research, capacity building and innovation. Through the Knowledge Brokerage function at the PCCC, the overarching goal of recently endorsed PCCC Partnership Framework for Knowledge Brokerage is to ensure that Pacific Governments and Stakeholders receive timely, robust information in user-friendly formats that will support informed decision-making and climate action. Climate knowledge brokers play a key role in information dissemination as well as tailoring and synthesising climate information for actionable use and decision-making – All encompassed along the Knowledge Brokerage journey. In the Pacific, the term 'Knowledge Brokerage' is fast becoming realised, however, the concepts behind it are ingrained our ways of life, our interactions with others, and our connections to 'home'. This event will highlight the role of the PCCC in pursuing best practices in climate knowledge brokerage in the region through the PCCC Partnership Framework for Knowledge Brokerage, lessons learnt in sharing knowledge and informed decision-making from each of the three (3) Pacific sub-regions, as well as the opportunities that knowledge brokerage bring to the table in the context of anticipatory climate action aligned to Pacific Island livelihoods and well-being.

The Effects of Climate Change on Literacy in Samoa.

Judy Pouono

In many parts of the world, climate change seems to be affecting both urban and rural communities alike. While some areas and societies suffer minor damages, other groups endure long term physical, emotional and financial constraints. This paper hopes to illustrate the effects of climate change on education, with particular emphasis on literacy in two (2) selected areas on the island of Upolu (Samoa).

Food histories in the Pacific Islands: An international law inquiry into indigenous sovereignty and food sovereignty.

Theodora Valkanou

Pacific Island states top the list of countries at risk of suffering a disaster being especially vulnerable to climate change and natural disaster risks. As the Food and Agriculture Organization of the United Nations (FAO) has recently confirmed in a 'flagship' report, food and agricultural systems are most susceptible in the context of disaster risk due to their great dependence upon natural resources and climatic conditions. This paper focuses on the organisation of food systems in the Pacific Islands and inquires into the enduring effect that imperial legacies – based on an ethic of extraction and exploitation – have on 21st century Pacific food systems. Drawing upon the food regime theory, I reveal the critical role that international legal norms and institutions have played in the construction of a region that is highly dependent on food imports and susceptible to food price spikes, and where local diets have profoundly changed causing a rise of so-called 'lifestyle' diseases. At the same time, however, I also draw attention to the resistance of several Pacific Island states which upon formal decolonisation sought to advance legislative reforms with a view to reclaiming control over their means of food production. Having these early decolonial visions as a starting point, I explore current possibilities in the ongoing process of decolonisation in light of the latest normative developments in food governance. By focusing on indigenous sovereignty and food sovereignty recognised under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the United Nations Declaration on the Rights of Peasants and Other People Working in the Rural Areas (UNDROP) respectively, this paper reflects on international law's potential to mobilise a structural reorganisation of food systems in the Pacific towards greater autonomy, and the restoration of indigenous foodways and cultures.

Parallel Sessions | Theme – Pacific Climate Partnerships		
Room/venue	**Session**	**Session Sub-theme**
Niule'a Seminar Room	**D2-Session 11 (D2-S11)**	**Climate Finance**

Our Islands, Our Culture, Our Identity. Stories of Pacific Islander Experiences of Non-Economic Loss and Damage Due to Climate Change.

Filomena Nelson
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The Pacific is already experiencing Non-Economic Loss and Damage due to the negative impacts of climate change. The worsening frequency and severity of slow-onset and extreme weather events place Pacific cultures, identities and security at the frontlines of the climate crisis. Non-Economic Loss and Damage is a recent addition to the climate policy negotiation space and as a result has received minimal attention in academia. Importantly the Pacific is severely underrepresented despite facing some of the most significant Non-Economic Loss and Damage impacts. This paper aims to bridge this problematic gap by centring Pacific experiences of Non-Economic Loss and Damage, arguing for the importance of sharing these stories, and underscoring the urgency of addressing Loss and Damage issues. Non-Economic Loss and Damage is complex and multifaceted and, therefore, impossible to capture through quantitative data alone. Therefore, this paper will draw from qualitative data from stories shared through case studies on six Pacific islands: Tuvalu, Fiji, Niue, Vanuatu, Samoa, and the Republic of the Marshall Islands. The countries prepared these case studies to submit to the UNFCCC to provide evidence of climate change's devastating impacts on the non-economic intangible elements of Pacific life. This paper will synthesise and analyse data from these case studies to build a comprehensive argument for the Non-Economic Loss and Damage felt in the Pacific. The case studies are built on sharing Pacific stories through qualitative data collection. This is important as Pacific Islander storytelling practice as a conduit of these Loss and Damage experiences is essential in building holistic Non-Economic Loss and Damage arguments and databases, paving the way to greater understanding and action. The discussion will draw on a theoretical framework model devised by the authors to synthesise the complex data in a concise and clear understanding of the Non-Economic Loss and Damage felt by the Pacific Islanders. Preliminary findings from the case studies indicate that the paper will provide a rich discussion of a myriad of interconnected impacts, including the impact on traditional knowledge, food and water security, sense of place and identity, physical, mental and emotional health, social cohesion and culture. Ultimately, the stories of the Islanders from the five case studies will be interwoven to create a tapestry of the impacts of NELD in the Pacific, presenting a comprehensive argument for greater NELD attention and the need to measure NELD through community-focused and grounded methodologies that centre Pacific voices.

MIRAB as Climate Resilience.

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The term MIRAB was initially coined by New Zealand economist Geoff Bertram and geographer Ray Watters in the mid-80s to describe the unique ways in which small island states in the Pacific have sustained their economies, primarily relying on foreign aid and migration-based remittances. However, it has since evolved into a widely recognized term highlighting the dependency, vulnerability, and unsustainable aspects of development pursed by Pacific states. The increasing popularity of Pacific labour mobility schemes and the associated rise in remittances have reignited discussions on the MIRAB economy's dependence on external sources and its long-term viability, especially in the midst of climate change. Focusing on the case of Samoa, this paper seeks to challenge this perspective, exploring how MIRAB serves as diplomatic leverage, strengthening interdependent relations between donor and recipient countries, as well as host and sending nations of seasonal workers, thereby promoting climate resilience and sustainability.

Economic and Social Impacts of Climate Change in Samoa.

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The rise in the prices of imported commodities because of the increase in the external suppliers' costs has given Samoa no option but a price taker of all these foreign imported commodities. Recently, a sudden rise in the prices of local produces such as coconuts (niu), fish, and so forth has seriously affected Samoa, particularly due to the impact on the welfare of poor and vulnerable population and local consumers. This paper describes the local produce price crisis and its effect on the region and then goes on to outline some factors that countries in the region need to put in place, as well as policies in order to mitigate the risks associated with the adverse effects of the local commodity boom. National policies are needed to improve agricultural productivity and reduce speculative activities that threaten food price stability in Samoa.

Recommendations to improve access to adaptation finance for Tuvalu.

Lisepa Paeniu

Tuvalu is at the forefront of the adverse impacts of climate change and has been experiencing these effects more regularly in the last two decades. The science is complemented by the evidence of the disappearing islets as the global earth temperature rises causing sea level rise, extended droughts, coral bleaching, severe storms coupled with king tides causing flooding and destruction to livelihoods and infrastructure. Given the high vulnerability to the adverse effects of climate change, lack of exports and resources, heavy reliance on foreign aid and development partners the emphasis placed on climate change efforts is centred on adaptation. There needs to be many changes to obtain effective climate adaptation finance for Tuvalu. Major problems include but are not limited to the absence of an agreed definition of what counts as climate adaptation finance, the rigid rules to access the finance, the fragmentation of the funding, high transaction costs with small project sizes, data limitations for adaptation projects and limited capacity, expertise and human resources to implement projects. Recommendations for better and effective climate adaptation finance access for Tuvalu include: Financing to be provided at scale, Financing to be readily accessible, Financing to be responsive to country needs not donor preferences, Financing to be in the form of grants and soft concessional terms not loans as Tuvalu is already in high debt distress, A special funding window for SIDS within global financing mechanisms. The research was conducted through available policies, laws, reports, high level dialogue Tuvalu government is involved in and interviews with department of climate change staff. There needs to be policy reforms and high-level dialogue and lobbying in order to implement these recommendations. To have effective climate adaptation finance there is more need to build capacity at local level therefore the focus shifts on country priorities and internal financial system overhauls. The strengths and shortcomings of these proposed reforms will also be discussed.

Thursday 23 May 2024

Parallel Sessions | Theme – Climate Finance and Oceans		
Room/venue	**Session**	**Session Sub-theme**
D101	**D3-Session 1 (D3-S1)**	**The Blue Pacific in a Changing Ocean & Climate Change Nexus**

Blue Carbon Ecosystems – Pacific.

Richard MacKenzie

Blue Carbon Climate Fellow
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Blue carbon ecosystems (mangroves, seagrasses, ocean) provide food, fiber, and fuel that help support Pacific nations and their people. BCEs are also critical elements in climate change mitigation and adaptation due to their massive carbon stores. These carbon stores can be used by Pacific Island nations to offset their GHG emissions in national communications, to help meet their NDCs, or to be potentially used in various C markets. While this has become an important topic globally and around the world, few Pacific Island nations are positioned to take advantage of BCEs. Palau appears to be further along in terms of Blue Carbon compared to other Pacific Islands due to the establishment of a permanent monitoring network in 2010. These plots have resulted in data that we have used to develop Palau's Climate Change Policy and in our 3rd national GHG Communications. Annual C sequestration rates determined from plot remeasurement has also resulted in data that has allowed us to pursue the possibility of participating in C markets or look at how much carbon we are losing when a mangrove is developed. This presentation will identify what blue carbon is, what the most actionable BCEs are, and how to work together across the Pacific so that other Islands can have similar national assessments of their blue carbon ecosystems.

A quantitative study of the intertidal seagrass carbon stocks spatial distribution in Bootless Inlet, Papua New Guinea.

Lynette Petsul

University of Papua New Guinea.

Coastal Blue Carbon vegetation includes Mangroves, Seagrass and Tidal Salt Marshes, these particular vegetations are well known for their capacity as nature-based solutions to the coastal impacts of Climate Change and variability. Seagrass meadows are significant effective Carbon sinks, sequestering atmospheric carbon dioxide (CO2) and capturing allochthonous organic material. The efficiency of the Carbon sink is highly dependent on inter-habitat linkages within the surrounding landscape that regulates carbon fluxes and maintain a healthy ecosystem state. Locating and sampling the intertidal Seagrass could offer a deeper look into Blue Carbon mitigation within the Bootless Inlet Marine Protected Area. Ten (10) Seagrass species have been recorded in Bootless Inlet of which the need of a baseline Carbon data was yet to be established. The objectives of the study were to obtain a preliminary Seagrass Carbon estimation, establish the Carbon relationships between its various Carbon pools and to use this particular data to determine its Carbon stocks spatial distribution within the Bootless Inlet, Marine Protected Area. The study was carried out in one (1) location- Bootless Inlet, Marine Protected Area divided to two (2) sample sites: (a) estuary and (b) island; a global positioning system (GPS) points were collected on every sampled locality and georeferenced on a surface aerial map of Bootless Inlet. Quantified Carbon measurements from three (3) compartments: (a) substrate, (b) standing stocks and (c) sea water were analyzed using two (2) chemical analysis to determine the Organic and In-Organic Carbon matter: 1). Loss On Ignition (LOI) was performed on a muffle furnace to calculate the organic Carbon and acidification titration was performed to calculate the inorganic Carbons, sea water was also titrated to estimate its alkalinity. The results from the analysis indicated that a greater amount of organic carbon was deposited within the estuary locality than from the island locality, whereas the inorganic Carbons was quite the opposite where a greater amount was deposited at the island than the estuary locality. From the three (3) compartments, findings showed that greater amounts are stored in the substrate (sediments) followed by the standing stock, sea water indicated Carbon mobility which plays a crucial role in Carbon management. All calculation of Carbon stocks was added to give an estimation of a sample Carbon fluxing in the study area. The Carbon stocks from seagrass adds intrinsic value to Blue Carbon Management and Climate Change Mitigation in the Bootless Inlet Marine Protected Area, such data are paramount in decision makings and development of Blue Carbon policies for Climate Change coastal mitigation in Papua New Guinea.

Assessing Blue Carbon Management Strategies in the Asia-Pacific Region.

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As global environmental concerns heighten, the effective management of blue carbon ecosystems emerges as a pivotal force in mitigating climate change and advancing sustainable development. The critical role of these ecosystems in carbon sequestration and biodiversity conservation underscores their significance. Amidst the escalating challenges of climate change, understanding how nations in the Asia-Pacific region, particularly Japan, China, Taiwan and Indonesia, address blue carbon management becomes imperative. This study employs UCINET 6 software to analyze and categorize blue carbon management strategies made by different stakeholders in Japan, China, Taiwan and Indonesia. The categorization includes key domains such as environmental education, research and technology, the economy, law and regulation, and regional and international cooperation. It considers a wide range of documentation such as published articles, data papers and public policies. The investigation serves as a crucial bridge between scientific knowledge and policy implementation. By systematically categorizing diverse approaches in the studied countries, the research aims to unveil patterns and variations in blue carbon management strategies. Simultaneously, it observes the interconnectivity of actors involved in these management strategies. The comparative analysis provides insights into the effectiveness of different pathways, offering valuable information for policymakers, environmentalists, and researchers. Additionally, as part of the research plan, recommendations specific to Taiwan's blue carbon management will be developed. In addressing the imperative for informed decision-making amidst a rapidly changing climate, this research anticipates contributing to the development of globally adoptable, robust policies, and strategies. As an integral part of the broader environmental sustainability discourse, the study seeks to empower stakeholders with transcendent knowledge, fostering collaborative and collective efforts towards a more resilient and sustainable future.

Comparative Assessment of Food Loss and Climatic risks in Dairy Farming Systems between Fiji and Australia.

Christian-Yves Amato-Ali

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Postharvest loss in dairy farming systems between Fiji and Australia remains a significant challenge that affects food security resilience and the livelihoods of farmers. There is a significant gap in knowledge concerning the comparative assessment of food loss in these dairy farming systems, with specific reference to the factors contributing to this loss. These factors such as climatic hazards, play a crucial role in diminishing the quality of dairy products and resulting in economic losses for farmers. This study sought to investigate and compare the key factors contributing to food loss in dairy farming systems, both on-farm and post-harvest, in Fiji and Australia. Additionally, the research examined the extent to which climate and environmental conditions impact food loss in both regions. The data was collected through a combination of on-farm surveys, post-harvest assessments, and climate data. The findings of this study are invaluable for the development of region-specific strategies aimed at reducing food loss in dairy farming systems within Fiji and Australia. Such strategies are essential for enhancing food security and economic stability in these regions, ultimately contributing to the overall development and sustainability of dairy production.

Food Security and Climate Change-Case study in Samoa.

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The emergence of the COVID-19 pandemic has worsened existing challenges related to food security, particularly in rural households where access to resources and services is often limited. While numerous studies exist to measure food security, the specific impact of COVID19 on rural households remains relatively unexplored, particularly in regions like Samoa. Given the novelty of the COVID-19 pandemic, there is a lack of empirical data on its impacts on food security in rural households. Thus, this study aims to fill this gap by providing baseline data needed to develop a better understanding of the existing status of food security impacted by the COVID-19 pandemic in rural households of Samoa. The study examines the impact of COVID-19 on food security across five rural districts in Samoa in relation to Socioeconomic Factors such as income levels, employment status, and resource access. Employing a mixed method approach, the study integrates quantitative and qualitative household survey interviews to capture multifaceted food security challenges faced by rural households in districts of Aana Alofi 1, Aleipata Itupa I Luga, Anoamaa East, Safata, and Siumu. Findings reveal widespread income reduction (73.42%), disruptions in food supply chains (90%), and increased food prices (94%). Health and nutrition issues affected 56% of respondents, with livelihoods significantly impacted. Factors contributing to food security challenges include income loss, transportation restrictions, and limited access to land. The findings highlight the importance of addressing these challenges through community-driven initiatives, awareness programs and sustainable agriculture practices for food security. Targeted interventions are crucial to building resilience and ensuring food security for future crises in Samoa.

Correlation between macroinvertebrates and the distribution of rainfall and water temperature in Rural Rivers of Upolu Island, Samoa: Implications of Climate Change.

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The effects of global climate change on freshwaters are still poorly known in Samoa, particularly in systems where they interact with other environmental variables. Two rivers on the south coast of Upolu Island were investigated to determine macroinvertebrate abundance and diversity. The temperature and rainfall data were also collected in June and July of the dry season to determine potential links between the macroinvertebrates and these physical parameters. Our observations show that macroinvertebrate abundance and richness decreased with increasing water temperature and increased with increasing rainfall distribution during the two sampled months. Over the period of two (2) months, the average temperature in the study area increased by a range of 1.40C to 2.60C. This study highlighted that temperature has a greater impact compared to rainfall distribution on macroinvertebrates of the two selected rivers.

Rising Health Risk of Women Due to Climate-Induced Disaster & Challenges to Access Healthcare Services: An Empirical Study on South-West Coastal Belt Areas of Bangladesh.

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Climate change is becoming a concerning issue globally. Its extreme effects are visible in the coastal areas of Bangladesh. Women and children are at hotspot and most vulnerable groups in these situations. This study aims to find the rising health risks of women due to climate induced disasters and challenges to access health care services empirically. A mixed research method was followed in this study. This includes a questionnaire survey with 120 respondents, 4 focus group discussion FGD) with 27 participants, and KII (Key Informant's Interview). The key findings of these three methods were merged and exhibited through DPSIR model. QGIS has also been used to locate the health infrastructures around Banishanta and Sutarkhali unions of Dacope Upazila which is the study area of the study. These two areas are surrounded by salt water due to its geographical locations. It creates different health problems like skin disease, hypertension, uterus problem of women and so on. Due to poor economic conditions women cannot ensure hygiene and health facilities as the government health care system cannot provide them good services due to misconducts and corruptions. The unavailability of medical equipment is also a reason behind it. Overall, the study results show that women in these areas are under severe health threat as the health facilities and infrastructural development is still not able to help them to surpass the obstacles.

PARTneR-2, strengthening resilience in Pacific Island Countries through the use of Climate Risk Decision Support Tools.

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Geospatial hazard risk management tools are essential decision support platforms enabling operators and decision-makers to better plan and prepare for, respond to, recover from, and build resilience to climate disasters. Such tools should have the flexibility to account for multiple hazard and asset exposure types as well as vulnerability characteristics that are representative of local contexts. While the use of such tools in Pacific Island Countries (PICs) is gaining momentum, there are challenges in data availability and quality, technical capacity and capability, and longer-term resourcing to ensure uptake, relevance and usability. To help address some of these gaps, the Pacific Risk Tool for Resilience (PARTneR) programme funded by the New Zealand Ministry of Foreign Affairs and Trade, aimed to build PIC capability in co-developing and using hazard risk modelling tools, data and information to support risk-informed, sector-based, decision-making. Now in its second phase, PARTneR-2 focuses on developing baseline fit-for-purpose modelling tools to enhance capability in managing climatic hazard risks in the Cook Islands, Republic of Marshall Islands (RMI), Samoa, Tonga, Tuvalu and Vanuatu. Delivery is framed around two overarching co-identified decision-support use cases: 1) Development of national scale climate-induced sea-level inundation risk profiles and projected changes over time to help inform and support adaptation and resilience planning initiatives including projects development; 2) Development of Tropical Cyclone (TC) Rapid Exposure Forecast (REF) reports for wind and potential flood hazards within 3-5 days of an imminent TC making landfall, and national Initial Damage Assessment (IDA) 1-2 days after the TC threat has impacted/passed as well as regional Post Disaster Needs Assessment (PDNA) 3-4 weeks after an event. The TC use case in particular is designed for decision-support usage by National Disaster Management Offices (NDMOs) and inter-related Emergency Operation Centres (EOCs) for response and recovery activities. Key assets or exposure types encompassed in the quantitative/geospatial damage and loss output reporting for both sets of use cases include buildings, population, critical infrastructure, lifelines/utilities, and landcover including agriculture. Here, we present the progress to

date regarding the baseline system tools, with particular emphasis on the developed national scale digital elevation models (DEMs) and hazard layers, and the compiled exposure datasets. Additionally, we describe the semi-automated analytical workflows, from the numerical and analytical models to the user-friendly visualization and uptake by core users (e.g., hazard risk information dashboards and reporting templates). Finally, lessons learnt, challenges and opportunities, are discussed to help guide/scope the ongoing work and project development.

Advancing Climate, Health, and Equity Outcomes through Local Action in the Indo-Pacific.

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The health impacts of climate change in the Pacific will be extensive yet there has been limited cross-sectoral engagement with climate-related health considerations in many Pacific countries. To address the need for cross-sectoral responses to climate-related health impacts, The Pacific Climate Change Centre and the University of Melbourne developed and delivered a training program on climate, health and equity to a cohort of 15 policy makers and researchers from the Pacific and Southeast Asia. Pacific Fellows have previously completed the PCCC's training on 'Health Systems and Climate Change: Enhancing Resilient and Low-carbon Development in the Pacific' from 29 August – 6 October 2022 and are members of a Community of Practice currently administered under the core function of the PCCC on capacity building. The program enabled knowledge exchange and enhanced capabilities through mentoring and the development of policy/practice outputs for implementation post-program. This includes the development of health-specific funding proposals and prioritized research. The cohort are also collaborating on a series of publications ahead of the development of the 7th IPCC Assessment Report. Bringing together program designers and cohort representatives, this panel session seeks to demonstrate the multiple benefits of gathering an interdisciplinary, cross-country cohort to learn from one another on core components of successful climate decision-making for resilient development. The session presents three case studies from Fellows across the Pacific on the application of their learnings and outputs upon returning home. The two-stage program commenced with the first stage in-person in Melbourne, Australia, in November 2023 and ran for six weeks. The second stage of the program was delivered in-person over a week in Samoa in March 2024. The cohort were supported prior to, during and following the program via an online platform that facilitated a Community of Practice. The session presents an exemplar of capacity building activities that extend knowledge, develops research and networks across the Pacific to strengthen regional climate resilience efforts.

Parallel Sessions | Theme – Climate Finance and Oceans		
Room/venue	**Session**	**Session Sub-theme**
D201	**D3-Session 2 (D3-S2)**	**Private Sector and Entrepreneurial Innovations**

Navigating the Nexus of Global Warming, Agriculture, and Food Security in a Changing Climate.

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In the 21st century, humanity faces a critical juncture with the unprecedented challenge of climate change. Anthropogenic activities like burning of fossil fuels and deforestation drive rapid climate transformations, impacting eco-systems, weather patterns, and societies. As temperature rise and extreme events increase, understanding climate dynamics is crucial. This sets the stage for exploring causes, repercussions, and the urgent need for collective action against this existential threat.This abstract delves into the complex challenges posed by global warming on agriculture and the ensuing impact on global food security. The study explores the multifaceted effects of rising temperatures, altered precipitation patterns, and extreme weather events on crop yields, water availability, and the overall stability of food production systems. The findings underscore the following key aspects: Crop Yield Variability: The study reveals that global warming contributes to shifts in temperature and precipitation, influencing crop growth cycles and yields. Some regions face heightened heat stress, resulting in diminished yields for specific crops. Water Scarcity: Changes in precipitation patterns and increased evaporation, exacerbated by higher temperatures, contribute to water scarcity in numerous regions. This poses a direct threat to agriculture as consistent and sufficient water supplies are essential for crop cultivation. Shifts in growing seasons: Warming climates disrupt traditional growing seasons, impacting the timing of planting and harvesting. This shift poses challenges to established agricultural practices, necessitating adaptability in crop choices and cultivation practices. Pests and Diseases: The study highlights how global warming alters the distribution and prevalence of pests and diseases affecting crops. Warmer temperatures may expand the range of certain pests, necessitating novel approaches to pest management in agriculture. Food Insecurity: The cumulative impact of these factors contributes to heightened food insecurity, particularly in vulnerable regions with limited adaptive capacities. Communities relying heavily on agriculture for livelihoods face increased challenges in securing a consistent and sufficient food supply. The research employed a comprehensive set of methods to investigate the interplay between global warming, agriculture, and food security which include Literature Review, Data Analysis, Remote Sensing, Crop Modeling, Case Studies, Interviews and Surveys, Policy Analysis, Modeling Future Scenarios, Stakeholders Workshops. Overall, the findings underscore the urgent need for comprehensive and adaptative approaches to address the challenges posed by global warming on Agriculture and global food security. Implementing these findings into policies and practices is crucial to building resilience in the face of a changing climate and ensuring sustainable food systems worldwide. In conclusion, the research illuminates the intricate and impactful relationships between global warming, agriculture, and food security. The findings underscore the urgent need for comprehensive and adaptive strategies to address the challenges posed by a changing climate on agricultural systems and, consequently, global and security. In moving

forward, a holistic and collaborative approach is essential. This involves continued research, knowledge-sharing, and the implementation of evidence-based policies to build resilience within agricultural systems. Stakeholders at local, national and international levels must work cohesively to mitigate the impacts of global warming, safeguard food security, and pave the way for sustainable and resilient agricultural practices. The findings from this research contribute valuable insights to inform such efforts and inspire a collective commitment to a more resilient and sustainable future for global agriculture.

ReefCloud: automated image analyses and statistical modelling to support Pacific coral reef monitoring and sharing of actionable data.

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The Pacific is home to 27% of the worlds coral reefs, and exemplifies everything we value about these marine habitats: from their outstanding biodiversity and beauty, to the deep cultural connection as foundations of atoll nations, and their role in providing food, jobs and coastal protection for the 13 million people that call the Pacific home. Because Pacific reefs are so central to people, biodiversity and economies, they also highlight our vulnerability to climate change: the theats facing coral reefs are also threats to our security and way of life. Despite their critical importance, only a relatively small proportion of Pacific coral reefs - 4000 reef sites out of 70,000 km2 of reef according to the Global Coral Reef Monitoring Network – are regularly monitored. Our global tracking of benthic community composition change is still heavily reliant on compiling in-water observations made by snorkelers and divers. Temporal and spatial inconsistencies in field data collection and barriers to integration and data sharing limit our collective understanding of regional-to-global reef health trends. ReefCloud is a collaboration between coral reef scientists and managers from the Pacific, Australia, and other collaborators across the globe, to build a purposeful tool that promotes collaboration and supports coral reef conservation efforts in the region. It is an open-access, cloud-based platform that uses machine learning and artificial intelligence to analyse photographs of coral reefs to extract and share data. In this presentation, we will share some of the features of ReefCloud, that brings together automated image analyses, statistical modelling, and reporting tools to communicate on the condition of coral reefs more efficiently. Through ReefCloud.ai, machine-learning-enabled automated image analysis can replicate expert observations from photo quadrats with an 85-95% confidence to produce accurate estimations of benthic composition (3% error), at a rate 700-fold faster than manual assessment. Through partnerships with SPREP and the GCRMN, institutions, and community groups, we highlight how ReefCloud is being used to facilitate regional reef monitoring and reporting.

Can Indigenous knowledge and practices of food preservation be an *insurance* for coping mechanism in the face of extreme events. A case study in Nabuna, Koro Island.

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Food preservation in the Pacific region is a critical aspect in ensuring food security and sustainability in a geographically diverse and culturally rich area. Most of these Pacific countries rely on subsistence agriculture and fishing. The practices of food preservation differ for each Pacific country. These practices include sun drying, smoking, and salting to ensure that access supplies from the plantation or sea have extended shelf life for daily consumption and not merely wasted away. Modern technologies for food preservation including refrigeration, canning, and freezing have also made inroads especially in urban and rural- urban areas, however, due to geographical locations not all communities have access to such infrastructure. This abstract provides an overview of the various traditional food preservation methods employed by the people of Nabuna in Koro Island, Fiji. It presented the findings of opportunities of being resilient during and after an extreme event and how this knowledge plays a pivotal role in ensuring food security during and after cyclones. Due to the island geographical location, access to infrastructures such as full supply of electricity is a barrier to preserve excess food supply, thus the use of traditional knowledge of food preservation is an ideal tool of insurance during such times. Community based initiatives are vital in addressing food preservation in Nabuna. These efforts will empower local communities with knowledge and ensure being resilient in any given situation.

KI MUA: Towards A Fossil Fuel Free Pacific.

Auimatagi Joe Moeono-Kolio

Chief Adviser - Pacific
The Fossil Fuel Non-Proliferation Treaty Initiative

The 15 largest greenhouse gas emitting nations are responsible for 71.88% of all annual global emissions. The 14 Pacific Island Countries (PICs) are responsible for just 0.23% of annual global emissions. The upfront estimated cost of replacing all existing fossil fuel electricity generation in the eight PICs profiled in this report ranges from $691 million USD to just over $1 billion USD, depending on the specific technology mix. A full decarbonisation of Pacific economies will lead to benefits quite apart from the obvious climate mitigation gains, including in the areas of public health, energy accessibility and economic development, disaster resilience, political independence, and global climate mitigation advocacy. A just transition must go beyond replacing one technology with another and encompass a holistic approach to economic development in the Pacific, characterised by economic diversification, poverty eradication, decentralised renewable energy systems, and the retraining and redeployment of fossil fuel workers. A genuine and full energy transition in the Pacific will not be possible without Global North nations providing substantial climate finance and expertise sharing in relevant sectors.

Explore the Potential of a Climate Financing Initiative for Tourism in Samoa.

Isabella Partick

Recent Graduate of Master of International Development, Massey University,
Aotearoa New Zealand
Regina Scheyvens
A VSA volunteer at the Samoa Tourism Authority (STA) as a Climate Change Finance Assistant

The objective of this research was to explore the potential of a climate financing initiative, namely Green Tourism Bonds, in Samoa. Furthermore, to align the initiative with their sustainable tourism development and climate financing approaches that are both currently present and within Samoa's future aspirations. Green Tourism Bonds is a climate financing initiative that connects tourism and provides capital where needed in restoration, recovery and adaptations to climate change in the tourism accommodation sector that draws on present forms of community resilience. This research was achieved through qualitative methods namely semi-structured interviews of experts in climate change, climate financing, resilience, and sustainable tourism in Samoa. These key informants were comprised of the Government of Samoa (incl. the STA) officials, tourism accommodation owners, Samoa's development partners and relevant financial institutions. The development issue/research problem is that globally-led climate financing initiatives are largely inaccessible and do not allow for Pacific island regions, in reference to Samoa, to tap into their already present forms of community resilience. An example of this resilience can be seen through Latai-Niusulu et al. (2020) cultural-ecological lens on climate change resilience, which directly draws from the knowledge that Samoans have been resilient throughout their history (Alefaio et al., 2019; Berkes et al., 2004; Crook & Rudiak-Gould, 2018b; McNamara et al., 2019; Meleisea, 1987; Walshe & Stancioff, 2018; Westoby et al., 2020). These historic, dynamic and adaptable patterns of resilience continue to be drawn upon in the contemporary climate change environment (Latai-Niusulu et al., 2020) and also ensure food security and sustained livelihoods (Berkes et al., 2004; Movono et al., 2017; Nunn, 2009). To achieve this, two discourses; sustainable tourism development and climate financing were connected using the award-winning Pacific Tourism Organisation (SPTO) "Pacific Sustainable Tourism Policy Framework". Ultimately, it was found that for climate financing to be long-term, in-country resilience, such as cultural ecological resilience needs to be at the forefront, and if it is to be connected to tourism, climate financing also needs to uphold how the principles established by the SPTO are conceptualised in Samoa. Green Tourism Bonds achieves both in theory and has proven contributions to the sustainable tourism development founded within Samoa. However, due to the enabling environment of the economic COVID-19 recovery and the 'newness' of climate financing, this approach is not recommended in the short- to medium-term in Samoa. This research presentation will discuss the importance of climate financing for the tourism sector in Samoa, and how sustainable tourism development needs to be involved.

Where is the climate money? Impacts of cyclones and droughts on farmers and fishers' livelihood and income and strength of resilience in Vanua Levu, Fiji.

Viliamu Iese[1,4], Filipe Veisa[1], Rarokolutu Ratu Tevita[1], Anamaria Tagicakiverata[1], Mesake Volau[1], Jioje Fesaitu[1], Simione Naivalu[1], Epeli Waqa[1], Nasoni Roko[1], Nasalo Salote[1], Navunicagi Otto[1], Jyoti Prasad[1], Timoci Koliyavu[1], Rahul Prasad[1], Sereana Rabalotu[1], Maluseu Tapaeko[1], Ruci Kurucake[1], Adi Davila Talemaimaleya[1], Christian Amato-Ali[1], Alistair Christopher Ward[1], Sioata Lota[1], Isireli Qionimua[1], Lasarusa Donuvakayanuanu[1], Elisabeth Holland[1], Giulio Paunga[1], Reginald Singh[2], Simione Veilawa[2], Jennifer Cisse[3], Jennifer Philip[3], Krishnan Narasimha[2].

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Our research explores the details of impacts of climatic hazards (cyclones and droughts) on 489 fishing and farming households in Vanua Levu, Fiji. In addition, understanding options for Disaster Risk Financing and demand for insurance and different types of products were discussed with farmers and fishers. Farmers and fishers have diversified and rely on different commodities for their livelihoods, but the impacts of cyclones and droughts on crops, livestock, fishing and farmers livelihoods are intensifying but with similar characteristics. The diversity of actions they are implementing to cope and adapt are mostly incremental types of adaptation. The loss and damage suffered by farmers and households are severe, despite different mechanisms employed to reduce risks on commodities. It takes about a year for households to recover from the impacts of cyclones or droughts. Unfortunately, households rely heavily on their own limited savings to respond and recover after an event. Most of the savings only lasted between one to three months. The savings were meant to improve education, health, food security of the households. After a cyclone or drought, the households divert limited savings to respond to the losses, leaving nothing for long term recovery, education and other important priorities for the household. Disaster Risk Financing Mechanisms (DRFM) such as insurance, credits and loans were highlighted as potential options to help farmers recover faster after disastrous events. Smart resilient investments to support farmers and fishers are needed. More awareness on financing mechanisms and understanding of details of different DRFM options are needed at the household level in Vanua Levu. Finally, the continuous suffering of farmers and fishers poses a question, on where is the climate money governments talk about, and how can governments, regional and international organisations “channels” climate change financing, including the new loss and damage funds to “avert, minimise and address” losses experienced by the farmers and fishers at the community level?

“

Deconstructing the barricades to direct access funding modality of climate finance in the Solomon Islands.

Bradley Dalipanda

Master of Energy and Resources Law candidate-2023/2024
Melbourne Law School, The University of Melbourne, Australia.

This research paper analyses key barriers that SI needs to overcome to have direct access to the funding modality of climate finance. It proposes a more appropriate option to finance its strategies under its recently launched Renewable Energy Road Map ('RERM') and the ambitious Nationally Determined Contributions (NDCs) under the Paris Agreement. One of the key objectives of the RERM is to convert the Honiara grid to 100% Renewable Energy by 2030. In this regard, the critical question for SI is how it will effectively leverage financial support for its renewable energy projects to achieve this target by 2030. Similarly, SI has also made ambitious commitments to tackle climate change through greenhouse gas emissions, climate resilience targets, and climate finance targets. However, the commitments set forth by SI in its NDCs and the successful implementation of its RERM by 2030 are conditional upon sustainable climate financial support from developed countries. There are several sources of external climate funds available that the SI could access to address issues relating to climate change. However, SI needs to enhance its Public Financial Management capacity to access these funds so the country may benefit from these financial resources. According to the IPCC, AR6 and Global Stocktake both indicate global emissions need to fall 43% by 2030 to reach the 1.5oC target enshrined in the Paris Agreement. However, the current levels of investment are insufficient to meet the temperature goals of the Paris Agreement, and private-sector funding shortfalls are acute. Therefore, a transition to decarbonizing the global economy is critical, which requires a significant increase in funding for low-carbon infrastructure such as the country's renewable energy projects. For SI, although SIG has mobilized USD 86 million from the Green Climate Fund (GCF), the current portfolio is highly concentrated, with one hydropower project managed by the World Bank. With the inception of its RERM in April 2022 and the existing ambitious NDCs, the current mobilization through the World Bank is simply inadequate. Simply put, SI needs an innovative strategy to ramp up financial support for its renewable energy projects. This, therefore, calls for global acceleration in investment through public finance. In that context, SI needs a new financial institution to de-risk capital, enhance knowledge sharing, operationalize friend-shoring, and better coordinate between project developers and financiers.

Combating Climate Change through Natural Products Research: A Perspective from Samoa.

Sekotilani Aloi

National University of Samoa

With growing concerns around climate change, the untapped potential of natural products research in Samoa presents an additional avenue for mitigation efforts. Natural products encompass a diverse array of chemical compounds derived from living organisms, offering an additional toolbox with versatile solutions for addressing climate challenges. Apart from their applications in human health as therapeutic drugs, natural products play an essential role in nutrition and food technology; cosmetics and biomaterial development; and agriculture. By harnessing the rich biodiversity of Samoa and the Pacific region, natural products chemistry can contribute to carbon sequestration, the development of sustainable biofuels, green chemistry practices, and the creation of plant-based materials. Advancing the field of natural products research in Samoa can empower our nation to continue to play a proactive role in climate change mitigation efforts through leveraging its unique natural resources for a sustainable and resilient future.

Parallel Sessions | Theme – Climate Finance and Oceans		
Room/venue	**Session**	**Session Sub-theme**
D101	**D3-Session 4 (D3-S4)**	**Community-Based Approaches and Traditional Knowledge**

Outcomes of the II Session of the UN Global Indigenous Youth Forum and priorities for Indigenous Peoples' Food and Knowledge systems in the Pacific region.

Yon Fernandez de Larrinoa[1]

Head, Indigenous Peoples Unit of the Food and Agriculture Organization of the United Nations (FAO)[1]

In October 2023, 186 Indigenous Youth from the seven socio-cultural regions, representing 54 countries, 98 Indigenous Peoples and speaking 93 languages gathered at FAO headquarters in Rome to participate in the II Session of the Biennial UN Global Indigenous Youth Forum (UNGIYF). The Pacific region delegation was composed by 15 Indigenous Youth from 11 countries. The establishment of the UNGIYF results from the recommendation 90 made by UNDESA to FAO through the UN Permanent Forum on Indigenous Issues (UNPFII) in 2019. The First Session of the UNGIYF was held online in 2021, resulting in the Indigenous Youth Global Declaration on Sustainable and Resilient Food Systems, which fed recommendations directly in the 2021 UN Food Systems Summit. The II Session of the UNGIYF, held at FAO Headquarters on 16-21 October 2023, and co-organized with the GIYC and the World Reindeer Herders Association, provided a space of dialogue between Indigenous Youth and Countries, UN agencies, universities and other actors to discuss policies affecting the future of Indigenous Peoples' food and knowledge systems in the context of climate and biodiversity action. New Zealand was one of the sponsors of this Session. The resulting Declaration on Safeguarding Seven Generations in times of Food, Social, and Ecological Crisis shed light particularly on (i) the future of Indigenous Peoples' food and knowledge systems in the context of climate and biodiversity action, (ii) the impact of ultra-processed foods on Indigenous Peoples' health, (iii) the protection of Indigenous plant genetic resources, and (iv) the importance of Indigenous-led education. During the II Session of the UNGIYF, Indigenous Youth from the Pacific delegation shared their concerns on the impacts of climate change and biodiversity loss on their traditional livelihoods. They presented key initiatives that they lead with aim to preserve their food and knowledge systems, culture and spirituality in face of those global challenges. Those were ranging from Indigenous-led ways of learning to school meals programmes, from traditional fishing methods to marine species monitoring. Key highlights presented by the Indigenous Youth resonated with the work of the Global-Hub on Indigenous Peoples' Food Systems highlighted in the White/Wiphala paper on Indigenous Peoples' Food Systems, and the FAO-Alliance of Bioversity International and CIAT publication on Indigenous Peoples' Food Systems: Insights of resilience from the front line of climate change. The Global-Hub is a space of co-creation of knowledge between Indigenous and non-Indigenous experts from Indigenous Peoples, universities, research centers and UN Agencies. Together, the 31 members bridge the gap of knowledge on Indigenous Peoples' food and knowledge systems and generate evidence on their sustainability and resilience elements in order to influence

global policy processes. Together with two Indigenous Youth from the Pacific Delegation (tbd), Yon Fernandez de Larrinoa will present the outcomes of the UNGIYF with a specific focus on the Pacific Region. Building on the existing work of the Global-Hub, the need to revitalize Indigenous Peoples' food and knowledge systems and to better understand the impacts of ultra-processed foods on Indigenous Peoples' health will be showcased.

Nature-based Solutions for Urban Climate Change Adaptation in Te Moananui Oceania: Centring Wellbeing and Indigenous Knowledge.

Maibritt Pedersen Zari[1,2]*, Paul Blascke[1], Sibyl Bloomfield[1,2], Luke Kiddle[1,3], Victoria Chanse[1,3], Mercia Abbott[1], Anita Latai-Niusulu[1, 4], Susana Taua'a[1, 4].

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[4]National University of Samoa, Apia, Samoa

Nature-based solutions (NbS) aim to enhance the resilience of ecosystems, their capacity for renewal and their ability to provide ecosystem services. As such they are valuable strategies to address societal challenges such as climate change and the pressures of urbanisation. Multifaceted NbS work with, rather than against, nature and can lead to more effective and culturally rooted solutions to societal challenges, by concurrently resetting socio-cultural systems through the restoration of ecological systems across interconnected landscapes, ocean ecologies, and the built environment. NbS have gained growing recognition globally as integrated approaches for responding to climate change, biodiversity loss, and broad sustainable development and resilience challenges. NbS, linked with traditional ecological knowledge (TEK), provide a critical opportunity to generate innovative adaptation responses to climate change in Te Moananui Oceania. Although considered to be innovative in terms of urban infrastructure design, the practice of working closely with nature to create and design effective and resilient human settlements while maintaining healthy ecosystems, has always been a cornerstone of traditional societies in Te Moananui Oceania. Indigenous knowledges, recognising the oneness of nature and culture, have long held that human wellbeing is inextricably connected to ecosystem health. Building on Indigenous framings of wellbeing and partnering TEK with NbS, leads to specific place-based urban design responses that offer long-term benefits in diverse Te Moananui Oceania contexts. This is particularly significant given climate change pressures faced by Te Moananui Oceania coastal communities and is important in the Te Moananui context given that most NbS research, framing, and definitions have emphasised approaches from the Northern Hemisphere with very different conditions and considerations. A team of researchers from across the region has been investigating how nature-based urban design solutions, rooted in Indigenous knowledges, can support climate change adaptation and individual and community wellbeing in various urban Te Moananui Oceania settings as part of the NUWAO (Nature-based Urban design for Wellbeing and Adaptation in Oceania) project. A variety of research and engagement methods including participatory mapping and design; fieldwork; ecological, climate, and cultural mapping; community workshops and interviews; design competition; collation of NbS design strategies into a regional guide; and other design-led research, have been used to investigate a way of approaching nature-based climate change adaptation that is unique to Te Moananui Oceania, grounded in climate justice and framed around local notions of human health and wellbeing. Principal project findings demonstrate that working with nature is likely to have deeper cultural meaning in the region as well

as potential political implications. This means there is a need to apply a cultural, values-based approach to adaptation that acknowledges the interconnected notion of living ecologies prevalent in TEK of Te Moananui Oceania, rather than adopt just a strictly technical Western science model approach. A framework for advancing nature-based adaptation in Te Moananui Oceania is presented that acknowledges the unique and diverse contexts and human-nature relationships found in the region.

Climate change impact on indigenous knowledge and traditions: Recognising the importance of indigenous knowledge and traditional practices in adapting toclimate change and preserving cultural heritage.

Solamalemalo Dr Hai-Yuean Tualima,

Faculty of Law, Te Herenga Waka—VictoriaUniversity of Wellington

Indigenous peoples' knowledge, heritage and experiences need to be acknowledged and integrated into dominant climate policies, climate research, and international, regional, national, and local responses to combat climate change. In the Pacific knowledge sharing is governed by custom, as well as international and national intellectual property (IP) laws, traditional knowledge laws and access and benefit sharing agreements with external collaborators. Custom and Pacific institutions familiar with custom, are poorly integrated into law and policy decision making that facilitates access to and use of Pacific knowledge and heritage. This presentation aims to start a regional discussion about how custom, and bureaucracies familiar with custom, can play a greater role in Indigenous Knowledge governance in light of the climate emergency. The proposed format is a Panel Discussion centred on practical examples that illustrate where custom has a relevant role to play. The concept for the Panel draws upon PhD fieldwork conducted in Samoa 2018-2022 using the Talanoa Research Method. Discussants included relevant government officials, village matai (chiefs), village participants, creators, healers, and small businesspeople. For those interested, a Fieldwork report which includes recommendations supported by this research will be available as pre-reading. Selection of practical examples will be settled through pre-meeting conversations with invited speakers. In addition to Dr Tualima, invited Panelists may include personal with experience in managing particular policy proposals. Possible topics are: Vanuatu International Court of Justice legal opinion on climate change, Climate change and traditional knowledge Database, TK's significance to climate change. Professor Kathy Bowrey (UNSW) has agreed to Chair. Relevant national and regional civil servants, community leaders, NGO personnel and international subject matter experts will be invited to the session. Following Panel speakers, the session will move to Q&A inviting any attendees to share their perspectives, experiences, responses and to help map future directions. This session seeks to address obstacles to consensus building and move past stop/start policy implementation that falters due to inadequate consideration of the on-ground resources and priorities. It hopes to facilitate greater consistency and granular consideration of local needs and interests in formulating regional approaches to governance of TK, heritage and knowledge sharing. The hope is to bring Pacific nations and communities into closer connection with each other through recognising the importance of custom and heritage in decision making about environmental management.

Assessing the effectiveness of traditional knowledge methods on climate and weather forecast within local communities of Samoa.

Roya Ieremia[1], Ioana Chan Mow[2], Taema Imo-Seuoti[2]

[1]Department of Science, National University of Samoa
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This study aims to assess the effectiveness of traditional knowledge methods in climate and weather forecasting within Samoa's local communities. The research methodology incorporates descriptive statistics to synthesize data from designated sites in Savai'i and take on inferential analysis to determine correlations among variables such as weather changes, plant growth rates, animal movements, and the timing of weather patterns. The data collection adopts a mixed approach, utilizing surveys and interviews to gain insights into common data patterns and the most effective indicators utilized by local communities for weather and climate predictions. Additionally, the study undertakings are to identify strategies for documenting and implementing new methods or indicators to improve the utility of traditional knowledge in these areas. The primary goal of this research is to bridge the divide between traditional knowledge and modern meteorological systems, thereby enhancing the reliability of weather forecasts in Samoa's local communities. By evaluating the effectiveness of traditional knowledge methods and exploring ways for improvement, this study contributes to a more strong and integrated approach to weather forecasting that honours and utilizes indigenous knowledge systems effectively.

Guardians – An Environmental Educational Programme fostering environmental literacy in Samoa.

Le'ausalilo Leilani Duffy-Iosefa

Oceans Director, Conservation International

"Guardians" is an experiential learning platform which was initiated by Conservation International and its partners, to improve the environmental literacy of Samoa and foster future Guardians of nature to strengthen Samoa's resilience to the impacts of climate change. There was a gap in the primary level environmental education and many students lack a critical understanding of crucial environmental concepts before entering college. Recognizing this gap, Guardians was designed to bridge and address early environmental education. To date, Guardians has been implemented in 7 districts in Samoa and more than 1000 students aged 10 – 13 have completed the programme. The experience and feedback have been exceptionally positive from students, parents and teachers alike, with strong recommendations for the programme to continue to engage more children. The objective of the session is to go into the development process of Guardians, shedding light on its inception and the reflective integration of ocean, coastal and cultural elements. Key components of Guardians will be highlighted, showcasing the approaches used to captivate young minds. The session will also explore implementation successes, emphasizing the program's adaptability and scalability. The lessons learned during the execution of Guardians will also be shared, providing valuable insights for future environmental education initiatives. This session aims to inspire and inform conference attendees about the transformative power of targeted environmental education and genuine partnerships. Guardians aspires to contribute to the development of a generation in Samoa that is environmentally conscious and able to undertake pro-environmental actions.

Parallel Sessions | Theme – Climate Finance and Oceans		
Room/venue	**Session**	**Session Sub-theme**
D201	**D3-Session 5 (D3-S5)**	**Sustainable Livelihoods for Pacific People**

Implications of the changing climate to Kava; lessons from Kava Farmers inVanualevu, Fiji.

[1]Ratu Tevita Rarokolutu, [1]Anamaria Tagicakiverata, [1]Jioje Fesaitu, [1]Claude Daveta

Viliamu Iese[2], Filipe Veisa, Mesake Volau, Simione Naivalu, Epeli Waqa, Nasoni Roko, Nasalo Salote, Navunicagi Otto, Prasad Jyoti, Koliyavu Timoci, Prasad Rahul, Rabalotu Sereana, Tapaeko Maluseu, Kurucake Ruci, Talemaimaleya Adi Davila, Amato-Ali Christian, Ward Christopher, Qionimua Isireli, Lasarusa Donuvakayanuanu, Elisabeth Holland, Giulio Paunga, Reginald Singh, Simione Veilawa, Krishnan Narasimha[1].

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Climate change is considered as the major catalyst to the increasing frequencies and intensity of disasters worldwide. Small Islands Developing States including the Pacific region are amongst the most vulnerable groups to the changing climate. Agriculture plays a pivotal role in the socio-economic development of many SIDS and its vulnerability to disastershas increased tremendously over the past decade. The depth and gravity of the implications of the changing climate to farmers is essential to recognize and document. Studies on '*farmers resilience'* in times of disasters is limited let alone access to disaster finance and insurance. The United Nations Capital Development Fund (UNCDF) in partnership with UNDP and the United Nations University (UNU) developed the Pacific Insurance and Climate Adaptation Programme (PICAP) to partner with local insurance companies aiming at providingimmediate financial assistance to affected individuals in vulnerable communities, especially tofarmers, fishers, small businesses, and cooperatives after disasters. This paper focuses particularly on Kava, a significant crop that is widely used across the Pacific, known for its cultural and socio-economic significance. The data was obtained by a cross-sectional study conducted selected communities from Vanua Levu, Kioa and Taveuni in the Northern part of Fiji. A total of 125 Kava farmers were interviewed using a contextualized toolkit developed by a working group consisting of researchers from UNU-Germany, UWI-Jamaica and USP-Fiji to study the demand for disaster risk insurance. The quantitative data were recorded on android tablets which captured household information on indemnity-based insurance and other traditional types of insurances. Finding of the study revealed that there is an increasing interest and participation of women in kava farming. Climate change impacts of changing weather patterns, frequent disaster occurrences affecting kava farming and harvesting. Despite these setbacks, kava farmers are resilient survivors, and the majority of these farmers depend on their savings to cater for their livelihood after disasters as access to disaster finance is a major challenge. Therefore, providing financial access and support to farmers in post disaster recovery and response will enhance their resilience in the face of changing climate.

Historical Mobilities and Contemporary Rootedness as Resilience in Climate Change: Tuvaluan Diaspora Within Oceania.

Fetaomi Tapu-Qiliho

In response to historical mobilities in colonialism, modern day Tuvaluan spaces in new host countries manifest resilience through ethnicity and belongingness within 'our Sea of islands' (Hauofa, 1994) and offers an optimistic perspective in the Climate Change conversation. The vulnerability, loss, and displacement discourse that abounds in Climate Change scholarship today is challenged through this heritage preservation and ecologically diverse resilience perspective. Diasporic communities within Oceania are spaces of rootedness in the uprootedness of the flux and flurry of climate change. The diaspora within Oceania conceptualises the existence of settler communities of Tuvaluan heritage on Kioa Island in Fiji and in the village of Elise Fou in Samoa and validates existing ties they have with their home of origin. Little is known about the immense potential of Tuvaluan communities that exist in other parts of the Pacific as opportunities to re-shape the vulnerability narrative. This presentation contributes unheard stories of diasporic spaces within Oceania as resilient ecologies in climate change uncertainty. Historical malaga of Tuvaluans borne out of 'loto fenua' and the existence of Kioa islanders and Elise Fou villagers in the modern day nations of Samoa and Fiji exemplifies the temporal and spatial dimensions of indigeneity. The settler communities that exist today in Samoa and Fiji manifest a different perspective to the Tuvaluan narrative in Climate Change. It contributes to the possibilities that answers to climate change adaptations and mobilities lie within Oceania and through an Oceania-centred focus.

Sustainable Agricultural Intensification in Pacific Countries as a Pathway to Transformational Climate Change Adaptation.

Tim Reeves[1], David Ugalde[1], Dorin Gupta[1], Gayathri Mekala[1], Surinder Singh Chauhan[1], Lau Viliamu Iese[1,2], Joeli Veitayaki[2], John Oakeshott[3], Ellen Iramu[3], Rainer Hofmann[4]

[1]The University of Melbourne, Australia
[2]The University of the South Pacific, Fiji
[3]The Secretariat of the Pacific Community, Fiji
[4]Lincoln University, New Zealand

This presentation reports the outcomes stemming from a recent collaboration in the Pacific region (https://www.aciar.gov.au/project/crop-2020-185). The partners involved in the project encompassed the University of Melbourne, the University of the South Pacific, The Secretariat of the Pacific Community (SPC), the Samoa Farmers Association, MORDI Tonga Trust and Lincoln University. The primary objective of the project was to investigate the potential of Conservation Agriculture and Sustainable Intensification (CASI) practices within smallholder farming systems as an adaptive response to climate change in Pacific Island Countries (PICs), with the aim to identify transformative changes for future implementation. The project entailed assessing research, technological, social, and policy interventions necessary for future implementation and upscaling of these more sustainable agricultural systems. Conducted across four farming systems in Samoa and Tonga, the project was characterised by close interaction with farmers, other local stakeholders and Project Advisory Groups. It used a mixed-methods approach that included qualitative data collection from primary and secondary sources, as well as quantitative data collection through focus group discussions and interviews. The study recommended various integrated CASI strategies tailored to each farming system. These strategies included trialling optimal genetic materials (crops and livestock) with nutrient cycling to enhance soil health, integrating legumes as rotational cover crops during fallow periods, and adopting no-till/minimum tillage practices alongside superior crop genetics. The findings highlighted the potential of CASI to yield significant and multifaceted benefits for farming systems in PICs, spanning productivity enhancements, financial gains, environmental improvements, social and gender equity advancements, as well as heightened resilience to climate change and reduced greenhouse gas emissions. Additionally, the project outlined several recommendations for future endeavours, such as channelling additional resources towards field validation for CASI implementation in PICs, leveraging newly established partnerships and networks, and closely aligning insights from this and subsequent projects with agricultural education and training providers in the Pacific Islands region.

Redefining the humanitarian landscape: Exploring Pacific-diasporic disaster resilience.

Malcolm Andrews (PhD student)

Petra Satele (PhD student)

Under the supervision of Professor Siautu Alefaio-Tugia. Our research is part of Dr Siautu Alefaio-Tugia's Rutherford fellowship study- titled 'Redefining the humanitarian landscape: Pacific-diasporic disaster resilience.'

University of Otago

The Pacific is recognised as the most disaster-prone region globally- Pacific communities within the Pacific Islands themselves, and the diaspora in Aotearoa NZ continue to face the impacts of cascading disasters. These events, a direct result of climate change, see natural hazards and disasters continue to increase in both frequency and intensity. These cascading disasters mean communities have less, if any, time to recover and prepare before the next event occurs. This continual disruption to everyday life overwhelms communities and also exposes societal inequities. Despite these challenges, Pacific communities within the Aotearoa NZ diaspora and across the globe, continue to come together and respond to disasters collectively- as families, churches and communities. Their response is often more swift, agile and enduring than that of aid agencies and governments, as kinship ties and regular systems of remittance are stronger and already in place. This research shines a light on Pacific diasporic and community-led responses to disasters and aims to: Explore and examine Pacific-diasporic responses to disasters and understand how resilience manifests in Pacific-diasporic communities before, during, and after a disaster. The Fijian Indigenous proverb, "*E sega ni vuka na kaka me biu toka na buina*" (a parrot will not fly leaving its tail in its nest) emphasises that we cannot build forward better from disasters without adopting cultural context and indigenous worldview. To embody this vital insight, we are committed to using Pacific indigenous methodologies- ensuring our research yields inclusive and relevant results for Pacific communities. Our research aims will be accomplished through using the Pacific methodology of *fa'afaletui-talanoa*, to capture experiences of Pacific responders and leaders across community, health and church organisations to recent cascading disasters in Aotearoa NZ and across the Pacific. Additionally, these aims will be met by mapping the visibility of Pacific-diasporic responses for redefining a future humanitarian landscape, and examining frameworks and policies grounded in indigenous knowledge and community resilience. Our findings will help to redefine a disaster response and humanitarian landscape, by contributing to policies and frameworks that will recognise and are inclusive of Pacific-diasporic community resilience, indigenous knowledge, culture and values.


"Embracing our Blue Pacific home, let us forge resilient pathways to weather the storms of climate change, ensuring a sustainable future for generations to come."

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