
PENEHURO FATU LEFALE



pene.lefale@outlook.com



+64 (0)4 387 1088 (landline)
+64 (0)21 162 8829 (mobile)



www.linkedin.com/in/penehurolefale



www.ilea.co.nz

Address:

32 Tirangi Road, Rongotai,
Wellington 6022 NEW ZEALAND

Nationality:

New Zealand/Samoa.

AREAS OF EXPERTISE

Climate Science, Climate Policy
Climate Resilience, International
Cooperation & Development,
Meteorology, International
Environmental Law and Policy,
Strategic Planning, Collaborative

ACADEMIC QUALIFICATIONS

Ph.D. Candidate (part-time), UNIVERSITY OF WAIKATO, 2006-current (suspended).

Doctorate in Philosophy: Climate Change and Disaster Risk Management.

Thesis: Managing extreme weather and climate events in Small Island Developing States of the Pacific; A vital first step towards building local adaptive capacity to anthropogenic climate change.

Master's Degree, The University of Auckland, Faculty of Law, Auckland, New Zealand, 2003

Master in Legal Studies (MLS)/Postgraduate Diploma in Legal Studies (PDipLS), focusing on International Law, Environmental Law, Commercial and Corporate Law (16 Points)

<u>Course</u>	<u>Description</u>	<u>Grade</u>
LLM 708	International Environmental Law	A

Dissertation: Climate Change Negotiations; Observations from the Frontline.

LLM 723	Mining, Energy Natural Resource Law	B+
----------------	--	-----------

Dissertation: Emissions Trading and the Clean Development Mechanism; Transfer of Energy Efficiency and Renewable Energy Technologies (TREE).

LLM 776	Law and Economic Regulation	B-
----------------	------------------------------------	-----------

Dissertation: A Review of the State-Owned Enterprises (SOE) Act 1986; The New Zealand Experiment.

LLM 705	Environmental Law and Policy	A-
----------------	-------------------------------------	-----------

Dissertation: A Review of National Strategies for Sustainable Development (NSSD) in Pacific Islands.

Bachelor of Science Degree, University of the South Pacific, Suva, Fiji, 1987

Majors: Physics & Mathematics.

Research Design and Implementation,
Programme Management.

LANGUAGES

English – fluent

Samoa – fluent

Maori – low

French-low

Spanish-low

Other Polynesian languages –
low/medium

CERTIFICATIONS

◆UNESCO/IOC, US NOAA, MCDM,
IGC/PTWC *Pacific Island Countries
Regional Training and consultation
workshops on strengthening tsunami
warning and emergency response and
ICG/PTWC New enhanced tsunami
products*, Wellington, New Zealand,
2013.

◆*Aligning with your values*, Cultures at
Work/MetService New Zealand, 2012.

◆*Leadership in Management*, The
Training Practice, NZ/MetService,
2011.

◆*South-South Cooperation on weather
and climate*. WMO/Regional Training
Centre, Nanjing University, China,
2010.

PROFESSIONAL EXPERIENCE


Director/International Climate Analyst, LeA International Consultants, Ltd, Wellington, New Zealand, 2015- current.

Co-develop the firm in 2015 with Dr Cheryl Anderson to work on climate change, disaster risk reduction (DRR) and resilience internationally, with focus on Asia-Pacific region

On Research and Development, I have an extensive international network of researchers and academics from the following Universities and development organizations in New Zealand, United States, Australia, United Kingdom, France, Samoa, PNG, Fiji, Japan, Germany, Barbados, Italy, Denmark, Finland, China, Bangladesh, Chile, India, Tanzania, and South Africa.

Selected consulting services:

- *Climate Science*: provision of science based advice on climate change. (Recent projects: Tokelau Living with Change (LivC), 2016-ongoing; IPCC Regional Meeting, 2015-ongoing; Joint Commission on Science and Technology, Pacific Global Climate Observing Systems, 2015-2016; Paris International meeting on Climate Science, 2015: International Conference on Southern Hemisphere Meteorology and Oceanography (ICSHMO), Oct 2015; Tokyo Conference on Climate Geoengineering (2016) and Berlin Conference on Geoengineering (2015), Senior climate adviser, Tokelau delegation to the UNDP Pacific RESPAC meeting, 13-15 March, 2017, Suva, Fiji, Resource person, SPREP, SPC, USP Tokelau workshop on Ocean Acidification, 24-27 Apia, Samoa.
- *Climate Policy*: provision of policy relevant advice on climate change and related hazards. (Recent and current projects; Tokelau Living with Change, 2016-ongoing; Representative on New Zealand's delegation to the UNFCCC COP22 – COP25, Senior Climate Advisor, Tokelau delegation to the Pacific Regional Preparatory Meeting for the UN Ocean Conference, 15-17 March 2017, Suva, Fiji). Currently serve as New Zealand representative on the UNFCCC Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts.
- *International Development*: Provision of advice on development and climate change (Projects: Tokelau LivC; SIDS meeting;



♦ *Regional Technical Meeting in Climate Information and Prediction Services (CLIPS) and Agrometeorological Applications for the Mercosur Countries.* WMO, Embrapa, UNI CAMP, INMET, Brazil, 2005.

♦ *Media/Public Relations, Media/Public Relations Training workshop, SPREP, Apia, Samoa, 1997.*

♦ *Certificate of Training, Coastal Geology, Guangzhou, China, 1987.*

♦ *Certificate in Energy Planning, ESCAP/PEDP/USP Energy Studies Unit (ESU) Suva, Fiji, 1986.*

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

♦ **Member**, United Nations Intergovernmental Panel on Climate Change (IPCC), 1997-current.

♦ **Trustee**, Pacific Development Conservation Trust (PDCT), Ministry of Internal Affairs/Ministry of Foreign Affairs and Trade (MFAT), New Zealand, 2016-current.

♦ **Professional Member**, Royal Society of New Zealand (RSNZ), New Zealand, 2003-current.

♦ **Professional Member**, American Meteorological Society (AMS), 2009-current.

♦ **Chair**, American Meteorological Society (AMS) Scientific and

UNFCCC COP22; Coalition of Atoll Nations on Climate Change (CANCC); Pacific Island Development Forum (PIDF).


- *National Meteorological and Hydrological Services (NMHS) Management Systems:* Assessments of NMHS management systems to improve operations and skills. Analyses include; assessment of current situation, user needs, policy, legal and institutional frameworks, strategic planning, and cost recovery (Recent assignment: Mid-Term Review Finnish-Pacific Project (FINPAC) Reduced Vulnerability of the Pacific Island Country villagers' Livelihoods to the effects of climate change, 2015).

Research and Development services:

- **International Climate and environmental policymaking:** investigate the past and future effects of climate change on selected countries, Pacific SIDS in particular.
- **Pacific indigenous pathways for managing climate risks:** investigate adaptive capacity of vulnerable indigenous Pacific communities to climate change and related hazards.
- **Climate Intervention (Geo-engineering):** investigate the likely implications of climate intervention (Solar Radiation Management (SRM) and Carbon Dioxide Removal (CDR)) technologies on society, the climate and environment to inform decisions and guide future research and development.

April 2014 – September 2015: International Climate and Policy Analyst, Bodeker Scientific, Wellington, New Zealand.

- Implemented four US-NZ Joint Commission Meeting on Science and Technology (JCM S & T) funded international projects:
 - Review of the Pacific Islands Global Climate Observing System (PI GCOS)
 - Health and Climate Early Warning System (H-CLEWS) in Samoa
 - Organised and hosted the American Meteorological Society (AMS) 11th International Conference on Southern Hemisphere Meteorology and Oceanography (ICSHMO)



Technological Activities Committee (STAC) on Meteorology and Oceanography in the Southern Hemisphere (AMS STAC MOSH), 2011-January 2017.

♦ **Chair**, AMS STAC MOSH 10th & 11th International Conference on Southern Hemisphere Meteorology and Oceanography (10ICSHMO, 11ICSHMO), 2012, 2014.

♦ **Member**, AMS STAC MOSH, 2009-2012.

♦ **External Research Affiliate**, Joint Centre for Disaster Research (JCDR), Massey University, Wellington, New Zealand, 2013 –current.

♦ **Board Member**, Wellington Conservation Board, Department of Conservation (DoC), New Zealand Government, Wellington, New Zealand, 2011-2016.

♦ **Member**, Pacific Climate Information System (PaCIS) Steering Committee, 2007-2011.

♦ **Senior Advisor (international)**, Pacific Risk Management 'Ohana (PRiMO), a collaboration of disaster risk management agencies and organizations in the Pacific Islands region, 2010 - current.

♦ **Member**, New Zealand Scientific and Research Delegation, US-NZ Joint Committee on Science and Technology (JCM S&T), New Zealand Government, Wellington, New Zealand, 2010-2016.

♦ **Member**, Deep South Challenge Expert Group, New Zealand National Science Challenges, Ministry of Business, Innovation & Employment (MBIE), 2013-2014.

- Explored the establishment of a Regional Training Centre Meteorology and Climatology at the University of the South Pacific (USP).

October 2012- March 2014: Pacific Manager, National Weather Service (NWS), MetService, Wellington, New Zealand.

The purpose of the position is to ensure (i) effective relationships with Pacific regional stakeholders in relation to meteorological services and (ii) effective management of regional meteorological support services that meet the requirements of development partners and or other contracting agencies.

Key accountabilities include;

- managing MetService/NIWA and other collaborating partners' delivery of international meteorological and related services' support to Pacific Islands. The support is funded by New Zealand government under MetService's contract with the Ministry of Transport (MoT contract), the United States NOAA Global Climate Observing System (GCOS) Technical Support Project (TSP), the United Kingdom Met Office World Weather Watch (WWW) Pacific Fund (PF), set up under the Voluntary Cooperation Programme (VCP) of the WWMO, Australian Bureau of Meteorology (BoM)/AusAid funded meteorological programmes in Pacific Islands, and one-off commercial contracts.
- leveraging business innovations and employment opportunities from international development assistance programme ('win-win-win' value for money makeover approach to delivery of development assistance to Pacific Islands).
- expanding, maintaining, enhancing and sustaining international cooperation and business innovations and services.

♦ **Professional Member**,
Meteorological Society of New Zealand, Wellington, New Zealand, 2006-2014.

♦ **Alternate Permanent Representative (PR)** of New Zealand with WMO, 2011-2012.

♦ **Member/Adviser** to NZ PR, New Zealand delegations to WMO Congress, EC, WMO RA V Sessions, WMO/SPREP's RMSD/PMC, Pacific Climate Change Round Table, Pacific Disaster Platform, 2001-2014.

♦ **WMO Scientific Officer**, represented WMO Secretary General at numerous international technical and scientific conferences (Asia, Pacific, Africa, Europe, North America, Caribbean, South and Latin America), 2005-2006.

♦ **Founding Member**, Alliance of Small Island Developing States (AOSIS), 1990-1991.

RECOGNITION & AWARDS

♦ IPCC Nobel Peace Prize Contributor, 2007.

♦ MetService (NZ) Chairman of the Board's award for contribution to the IPCC, 2007.


♦ British Council of New Zealand (BCNZ), Royal Society of New Zealand (RSNZ), Fulbright and Montana Wines'

September 2006 - October 2012: Manager, International Affairs Office (IAO), MetService, Wellington, New Zealand.

The purpose of the position was to ensure (i) effective relationships with international partners and stakeholders in relation to meteorological services and (ii) effective management of international meteorological support services that meet the requirements of development partners, other contracting agencies and private companies.

Key accountabilities include;

- managing MetService's International Affairs Office, focusing on New Zealand's participation in international weather, climate and water operational and research programmes, in particular, those programmes supported by external donors (e.g. Australian Bureau of Meteorology (BoM)/AusAID, US NOAA, WMO, Finland, Italy, EU, Japan, etc.) for Pacific Island Countries. The support is funded by the New Zealand government under MetService's contract with the Ministry of Transport (MoT contract), the United States NOAA Global Climate Observing System (GCOS) Technical Support Project (TSP), the United Kingdom Met Office World Weather Watch (WWW) Pacific Trust Fund (PF), set up under Voluntary Cooperation Programme (VCP) of the World Meteorological Organization (WMO), Australian Bureau of Meteorology (BoM)/AusAid funded projects in Pacific Islands (Climate, Weather and Tsunami regional programmes) and one off commercial contracts.
- Leveraging business innovations and employment opportunities from international development assistance cooperation ('win-win-win' value for money makeover to delivery of development assistance to developing countries in the WMO Regional Association V (RA V) region in particular).
- expanding, maintaining, enhancing and sustaining international cooperation and business innovations and services (non-financial performance targets).



Masters Scholarship Study tour of the United Kingdom, 2002.

♦New Zealand Ministry of Pacific Island Affairs (MPIA) Louise Crawley Masters' postgraduate scholarship in public policy, 2002.

♦The United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA) National Weather Service (US NOAA NWS) Special Award "In recognition and appreciation of significant services rendered for the National Weather Service", 2000.

♦The United States Department of Energy Atmospheric Radiation Measurement Programme (US DOE ARM) plaque for outstanding contributions to the ARM programme in the Tropical Western Pacific (TWP), jointly with SPREP, 1999.

February 2006 - September 2006: PhD student, International Global Change Institute (IGCI), University of Waikato, Hamilton, New Zealand.

Title of thesis: *Managing extreme weather and climate events in Small Island Developing States of the Pacific; A vital first step towards building local adaptive capacity to anthropogenic climate change.*

March 2005 - January 2006: Scientific Officer/Acting Chief, World Climate Applications and Prediction Services Programme, including the Climate Information and Prediction Services (CLIPS) project (WCAC), World Climate Program (WCP) Department, World Meteorological Organization (WMO), 7 bis, avenue de la Paix, Case postale 2300, CH 1211, Geneva 2, Switzerland.

Contracted by the WCP programme of WMO to manage the WCAC in collaboration with other WCP programmes, other UN Specialized Agencies with climate related mandates (e.g. World Climate Research Program (WCRP), World Climate Impacts, Assessments and Response Program (WCIRP), IPCC, Group of Earth Observation of Systems and System (GEOSS) of the Group of Earth Observation (GEO), and other International Climate Programmes and Activities under the Climate Agenda.

Main areas of responsibilities include; implementation of Regional Climate Outlook Fora (RCOFs) and CLIPS workshops within the six Regional Associations (RA) of WMO (e.g. represented WMO at the first Asian RCOFs in Beijing, China (7-9 April 2005), WMO/International Research Institute (IRI) International Workshop on Climate Predictions and Agriculture – Advances and Challenges, Geneva, Switzerland (11-13 May 2005), the NATO Climate Advanced Climate Study Institute, Gallipoli, Italy (23 May – 3 June 2005), the Regional Technical Meeting of CLIPS and Agrometeorological Applications for the Mercur



Countries (Brazil, Uruguay, Argentina, Paraguay, Ecuador), Sao Paulo, Brazil (13-16 July 2005), and the WMO RA II South America RCOF/CLIPS National Focal Points Meeting, Lima, Peru (08-18 August 2005).

Prepared reports, meeting papers and documents for WMO constituency bodies, technical commissions (e.g. Commission on Climatology (CCI), CCI's specialized Open Program Area Groups (OPAGs), Expert Teams (ET) on various issues (e.g. ET on Climate and the Environment, ET on Climate and Health, ET on ENSO, ET on Seasonal to Interannual Predictions (SIP), ET on Regional Climate Centres (RCC), et) and other WMO specialist scientific bodies' conferences and meetings.

Drafted the WMO's Programme on Least Developed Countries (LDC), WMO's Strategic Action Plan for Small Island Developing States (SIDS) and WMO's Disaster Prevention and Mitigation Programme.


WMO focal point for the organisation of the 2006 WMO Conference on '*Living with Climate Variability and Change: Understanding the uncertainties and managing the risks*', held in Espoo, Finland, July 2006 as well as the World Climate Conference three (WCC3), a follow up to the First (1979) and Second World Climate Conference (1990) organised by WMO and other UN specialised agencies such as UNEP.

2001- March 2005: Pacific Climate Analyst, National Institute of Water and Atmospheric Research of New Zealand (NIWA), NIWA Auckland, Level 3, 269 Khyber Pass Road, Newmarket, PO Box 109695, Newmarket, Auckland, New Zealand.

Areas of Research:

- Adaptation and Mitigation to climate variability and anthropogenic induced climate change: developing a tool (model) on adaptation and





mitigation to climate change for Pacific Islands, with traditional indigenous and ecological knowledge (TEK) of weather and climate forecasting as the basis for formulating locally appropriate adaptation response policies and measures at all levels.

- Seasonal to Interannual climate forecasts: improved understanding of seasonal-to-interannual climate forecasts. This research work complements the traditional indigenous knowledge research work particularly in the verification and validation of local forecasts.
- One of the team of climate scientists producing the NIWA Island Climate Update (ICU) (3-months climate outlooks for Pacific Islands).
- Climate Policy: A Pilot Study on the Evolution of the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto protocol Greenhouse Gas Mitigation/adaptation Regime. This research brings in the political and human dimensions (TEK in particular) of climate change.

1996-2000: Climatology/Meteorology Officer and United States Department of Energy Atmospheric Radiation Measurement for the Tropical Western Pacific (US DOE ARM TWP) Programme Coordinator, Secretariat of the Pacific Regional Environment Programme (SPREP), Apia, Samoa, Los Alamos National Laboratory, University of California, New Mexico, USA.

Scientific and Technical Adviser to the Alliance of Small Island States (AOSIS) between 1996-1997 in the lead up and during the UNFCCC/Kyoto Protocol negotiations.

Instrumental in formulating the Strategic Action Plan for the Development of Meteorology, including climatology, in the Pacific region (SDMP), 2000-2009. The SDMP has been the blueprint for development of meteorology, including climatology, in the Pacific Islands. The SDMP provides the



framework for the 2012 Pacific Islands Meteorological Strategy, 2012 – 2015.

Successful fundraiser for SPREP and the Pacific Island Countries. Secure funding from various development partners (Australia, New Zealand, USA, France, Italy, People's Republic of China, Denmark, etc.) and agencies for implementation of the SDMP and other regional programs and activities in the Pacific (e.g. Annual Meeting of Regional Meteorological Services Directors Meeting, workshops, etc.) Procured funding for the Pacific regional climate bulletin (Island Climate Update (ICU) from various developmental partners.

Successfully negotiated and coordinated the establishment of the two US DOE ARM climate research stations (Atmospheric Radiation and Clouds Stations (ARCS) on Papua New Guinea (PNG) and Nauru.

One of SPREP's staff handpicked by SPREP Management to assist consultants to pull together the SPREP Action Plan 2001-2004, SPREP Corporate Plan, 2002-2005.

Contributor to many SPREP and Pacific agencies (e.g. other CROP) strategic and action plans, meetings, conferences, public awareness and training, resource mobilisation. Examples include the convening of the Pacific Islands Conference on Climate Change in 2000, which formulated for the first time 'The Pacific Islands Framework for Action on Climate Change and Sea Level Rise', the Pacific Islands (PI) GCOS Action Plan, the first Strategic Action Plan for the Development of Meteorology in the Pacific, 1999-2009, the Pacific Meteorological Services Needs Analysis: Meeting the Challenges (MTC: PMS), to name a few.

1995- 1996: Consultant to the Government of Denmark (Danish International Development Agency (DANIDA), Ministry of Foreign Affairs), based in Ottawa, Ontario, Canada.





Contracted by the Danish government to formulate a joint DANIDA-Pacific Islands project proposal on climate change and energy. The proposal 'Climate Change, Energy for Pacific Islands' was accepted and funded by DANIDA (NZ\$1.2 million over ten years).

Scientific and Technical Adviser to Climate Action Network (CAN) Asia-Pacific to the First Conference of the Parties to the UNFCCC in Berlin 1995 (COP1). Spoke on behalf of all Environmental Non-Governmental Organizations (NGOs) to the Ministerial Session of COP1.



PUBLICATIONS

- Lefale, P.F.**, (2021): *Geoengineering our climate: Should-Should-We do it? A compact Commentary*. In: Petra Butler and Catherine Lorns (ED.), (2021). *Environmental Law, Dispute Resolution and Small States*, Institute of Small and Micro-States, United Kingdom (in press).
- Horton, J, P.F., **Lefale, D. Keith** (2021): *Parametric Insurance for Solar Geoengineering: Insights from the Pacific Catastrophe Risk Assessment and Financing Initiative*. *Global Policy Journal*, Durban University, First published: 10 October 2020, <https://doi.org/10.1111/1758-5899.12864>
- Tamasailau Suaali'i-Sauni and Penehuro Fatu **Lefale** (2021): *O le Ua e afua mai Manu'a: A Samoan Indigenous reading of the impacts of climate change*; In: *Environment and Belief Systems – Key Concepts in Indigenous Studies*, (Editors: G.N. Devy, Geoffrey V. Davis), Routledge Taylor & Francis Group, London & New York. ISBN: 987-0-367-67444-1, ISBN: 987-0-367-81427-4.
- Lefale, Penehuro Fatu and Cheryl Lea Anderson.**, (2019): *Climate Engineering and Small Islands: Panacea or Catastrophe?* In: *Geoengineering our Climate? Ethics, Politics, and Governance*, Jason. J. Blackstock and Sea Low, Eds., Routledge, 2 Park Square, Milton Park, Oxon, OX14 4RN and Routledge, 711 Third Avenue, New York, NY 10017, 159-163.
- Lefale, P.F.**, (2018): *Pacific Reset: A new New Zealand foreign policy direction in the Pacific?* Op ed, LeA International Consultants, Ltd, Wellington, New Zealand. http://www.ilea.co.nz/resources/Lefale_Pacific2018.pdf
- Lefale, P.F.**, H.J. Diamond, and C.L. Anderson., (2018): *Impacts of Climate Change on Extreme Events relevant to Pacific Island Commonwealth Member States (Pacific CMSs)*, Confidential report for the Commonwealth Secretariat, London, UK, 24 pages. LeA International Consultants, Ltd, Wellington, New Zealand.
- Lefale, P.F.**, P. Faiva and C. Anderson., (2017): *Living with Change (LivC): An Integrated National Strategy for Enhancing the Resilience of Tokelau to climate change and related Hazards, 2017-2030*. Wellington, New Zealand: Government of Tokelau and LeA International Consultants, Ltd.
- Lefale, P.F.**, P. Faiva and C. Anderson., (2017) *Living with Change (LivC): An Integrated National Strategy for Enhancing the Resilience of Tokelau to climate change and related Hazards, 2017-2030 – IMPLEMENTATION PLAN, 2017-2022*. Wellington, New Zealand: Government of Tokelau and LeA International Consultants, Ltd.
- Sugiyama, M., S. Asayama. A. Ishii; T. Kosugi, J. C. Moore, J. Lin, **P.F. Lefale**, W. Burns, M, Fujiwara, A. Ghosh, J. Horton, A. Kurosawa; A. Parker, M. Thompson, P-H. Wong, L. Xia (2017) The Asia-Pacific's role in the emerging climate engineering debate *Climatic Change* doi: 10.1007/s10584-017-1994-0
- Lefale, P.F.**, (2016): AOSIS: Climate Clubs and the Alliance of Small Islands States (AOS). In: *Climate Alliances après Paris, The Potential of Pioneer Climate Alliances to contribute to Stronger Mitigation and Transformation*, Ott., H, S. Baurer, F. Mersmann, L. Weisher, S. Huq, N. Nadir, F. Rahmen, E. Rovere, C. Cassen, J.C. Hourcade, E. Rennkamp, A. Marquard and R. Bakiika (in press).



- Swennenhuis, J, P. White, P.F. **Lefale**, O. Silfverberg, J. Pelton., (2015): Report of the Mid-Term Review Finnish-Pacific Project (FINPAC) Reduced Vulnerability of the Pacific Island Country villagers' Livelihoods to the effects of climate change, August 2015, FCG International Ltd, 41 pages + annexes (Confidential Report to the Finland Ministry for Foreign Affairs (MFA)).
- Lefale**, P.F. and Cheryl Anderson., 2014 Climate Engineering and Small Islands: Panacea or Catastrophe?, <http://geoengineeringourclimate.com/2014/05/06/climate-engineering-and-small-island-states-panacea-or-catastrophe-opinion-article/>
- Lefale**, P.F. and Howard Diamond., 2014 Pacific Climate Case Study: Tropical Cyclone Evan – A Rare Early Season Major Storm in the South West Pacific, Scientific Poster accepted for the 94th American Meteorological Society (AMS) Conference, Atlanta, Georgia, USA, February 2014.
- Pelton, J and **P. Lefale.**, 2012: Finnish-Pacific Project to Reduce Vulnerability of the Pacific Island Countries' Livelihoods to the effects of climate change (FINPAC) & Improved Capacity of the Pacific Island Countries National Meteorological Services to deliver weather and climate services (FINPAC-FMI), Project Appraisal Final Report, Presented to the Ministry of Foreign Affairs, Finland, Finnish Consulting Group Ltd (FCG), Helsinki, Finland, 51 pp. (confidential report).
- Lefale**, P.F., D. King, A. Ngari, 2012: Managing climate risks using Polynesian knowledge, State of the Climate report 2011, US NOAA and WMO publication, NOAA, <http://www1.ncdc.noaa.gov/pub/data/cmb/bams-sotc/climate-assessment-2011-lo-rez.pdf>
- SPREP, 2012: Pacific Islands Meteorological Strategy (PIMS), Contributor, SPREP and WMO publication, Apia, Samoa.
- Lefale**, P.F., 2009: Ua 'afa le Aso. Stormy Weather today: traditional ecological knowledge of weather and climate; The Samoa Experience. Climatic Change, Vol. 100, Number 2, 317-335, DOI:10.1007/s10584-009.9722-z <http://www.springerlink.com/content/w4170n44610n2431/>
- Lefale**, P.F., 2007: Enhancing Meteorological Services in the Pacific. *Meteo World*, October 2007, World Meteorological Organization (WMO), Geneva, Switzerland. http://www.wmo.int/pages/publications/meteoworld07/_archive/en/october2007/pacific.html
- Mimura, N., L. Nurse, R.F. Mc Lean, J. Agard, L. Briguglio, **P. Lefale**, R. Payet and G. Sem, 2007: Small Islands, Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M. L. Parry, O.F. Canziani, J.P., Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 687-716. <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter16.pdf>.
- Nyenzi, B., and P.F. **Lefale.**, 2005: El Niño Southern Oscillation and Global Warming. In: *Advances in Geosciences*, 6, 1-7, SRef-ID: 1680-7359/adge/2005-6-1, European Geosciences, Germany. <http://www.adv-geosci.net/6/95/2006/adgeo-6-95-2006.html>
- Lefale**, P.F., 2005: Catching a Tuna with an ENSO Prediction, How Climate Information and Prediction Services (CLIPS) is helping Small Island Developing States in the Pacific (SIDS-Pac), In: *WMO Bulletin*, Vol. 55 (1), and World Meteorological Organization (WMO).





- Lefale, P.F., S. Burgess and J.M. Salinger., 2005:** *Weather, Climate and the Squash Industry of Tonga*, Report for the United Nations Food and Agriculture Organization (FAO) Sub-regional Office for the Pacific, Apia, Samoa. National Institute of Water and Atmospheric Research of New Zealand (NIWA), NIWA Report, Published by NIWA Auckland, Auckland, New Zealand. 35 pp.
- Salinger, J.M and P.F. **Lefale.**, 2005: The Occurrence and Predictability of Extreme Events over the South West Pacific with particular reference to ENSO. In: *Natural Disasters and Extreme Events in Agriculture*, Sivakumar, M.V.K., R.P. Motha and P.D. Harièada (eds.), World Meteorological Organization (WMO). Springer Berlin Heidelberg New York, Springer, 39-48.
- Lefale, P.F and D.N.T. King., 2005:** Facing weather and climate variability with indigenous knowledge, Island Climate Update (ICU), Issue No. 52, National Institute of Water and Atmospheric Research of New Zealand (NIWA), NIWA Auckland, Auckland, New Zealand, p.6. Available online at <http://www.wamis.org/countries/southpac/spacClimate200412.pdf>
- Lefale, P.F, 2004:** The role of traditional indigenous knowledge of weather and climate in improving scientific understanding of future climate changes: The Samoa Experience, In: *Asia Pacific Network (APN), University of the South Pacific (USP), US National Oceanographic and Atmospheric Administration (NOAA), University of Hawaii East West Centre (EWC), National Institute of Water and Atmospheric Research of New Zealand (NIWA) Training Institute on Climate variability and Extremes Course Booklet*, Published by the APN/USP/NOAA/EWC/NIWA, Suva, Fiji. 85 pp.
- Lefale, P.F, 2004:** Climate Change Negotiations: Observations from the Frontline, In: *Asia Pacific Network (APN), University of the South Pacific (USP), US National Oceanographic and Atmospheric Administration (NOAA), University of Hawaii East West Centre (EWC), National Institute of Water and Atmospheric Research of New Zealand (NIWA) Training Institute on Climate variability and Extremes Course Booklet*, Published by the APN/USP/NOAA/EWC/NIWA, Suva, Fiji. 85 pp.
- Lefale, P.F., 2003:** Indigenous knowledge in the Pacific, TIEMPO, Issue 49, Available online at http://www.tiempocyberclimate.org/newswatch/xp_feature040730.htm
- Lefale, P.F., 2003:** Seasons in Samoa, Water and Atmosphere (W&A), Vol. 11, 2., National Institute of Water and Atmospheric Research of New Zealand (NIWA), NIWA Christchurch, Christchurch, New Zealand. Available online at <http://www.niwa.co.nz/pubs/wa/11-2/samoa>
- Lefale, P.F., Lehodey, P., Salinger, J., 2003:** *Impacts of ENSO on Pacific Island Countries*, NIWA Client Report AKL 2003-15, Report for the World Wide Life Fund for Nature (WWF), Washington DC, USA, Published by NIWA Auckland, New Zealand, 16 pp.
- Lefale P.F., Salinger, JM., Reid, S., 2003:** *Climate and Weather of Nouakchott, Mauritania*, Report for the National Radiation Laboratory (NRL), Christchurch, New Zealand, Published by NIWA Auckland, New Zealand, 33 pp.
- Lefale, P. F., 2003:** Equity, Climate Change and Sustainable Development: A brief Overview. In: *World Wide Life Fund for Nature (WWF), Workshop Report "The Kyoto Protocol and Preventing Dangerous Climate Change"*, Rarotonga, Cook Islands, 22-24 September 2003, WWF Pacific, Suva, Fiji, 11-12, 23.





- Lefale, P.F., J.M., Salinger, A. Volentras and T. Nakalevu., 2003:** *Your Passport to Climate Change*, Book for the Canadian Development International Agency (CIDA) and South Pacific Regional Environment Programme (SPREP), Apia, Samoa, NIWA publication, Published by NIWA Auckland, New Zealand, 33 pp.
- Salinger, M.J., Clarke, G., Collins, D., Diamond, H., Ngari, A., Nitschke, K., Plummer, N., **Lefale, P.F.**, Pratt, C., Raj, R., and Taiki, H; 2003: *The Pacific Island Global Climate Observing System (PI-GCOS): Action Plan 2003-2008*. ISBN: 982-04-247-6, South Pacific Regional Environment Programme, Apia, Samoa, 29 pp.
- Lefale P.F., Salinger J.M., Reid S., 2002:** *The Climate and Weather of Christmas Island, Kiribati*, National Institute of Water & Atmospheric Research Ltd (NIWA), Report prepared for the National Radiation Laboratory (NRL), Ministry of Health, Christchurch, New Zealand, Published by NIWA Auckland, New Zealand, 35 pp.
- Lefale, P.F., 2002:** *A Review of National Strategies for Sustainable Development (NSSD) in Pacific Islands*. Dissertation Paper (No. 4), International Environmental Law and Policy, Faculty of Law, University of Auckland, Auckland, New Zealand.
- Lefale, P.F., 2002:** *A review of the State Owned Enterprise (SOE); The New Zealand Experiment*. Dissertation Paper (No. 3), Law and Economic Regulations, Faculty of Law, University of Auckland, Auckland, New Zealand.
- Lefale, P.F., 2001:** *Emissions Trading and the Clean Development Mechanism; Transfer of Energy Efficiency and Renewable Energy Technologies (TREE)*, Dissertation Paper (No. 2), Mining, Energy and Natural Resources Law, School of Law, University of Auckland, Auckland, New Zealand.
- Lefale, P.F., 2001:** *Climate Change Negotiations-Observations from the Frontline*. Dissertation Paper (No. 1), International Environmental Law), Faculty of Law, University of Auckland, Auckland, New Zealand.
- Lefale, P.F., 2001:** Impacts of Climate Change on Pacific Islands, Pacific Ecologist, Issue 1, Published by Pacific Institute of Resource Management, Wellington, New Zealand. Available online at <http://www.converge.org.nz/cdn/resources/material/pacificecologist.html>
- Krishna, R., P.F. **Lefale**, M. Sullivan, E. Young, J.C. Pilon, C. Shultz, G. Clarke, M. Hassett., S.B. Power, R. Prasad, T. Veitch, K. Turner., E. Shea, H. Taiki., and R.R. Brook., 2001: Pacific Meteorological Services: Meeting the Challenges, SPREP, WMO and Bureau of Meteorology, 98 pp. Available online at http://www.bom.gov.au/inside/eiab/reports/ar0102/Appendix/13_Publications_2001-2002.shtml
- Salinger J., **Lefale, P.F.**, Wratt D., Mullan B., 2001: *Review of the Working Group I Contribution to the Intergovernmental Panel on Climate Change Third Assessment Report (IPCC TAR); Implications for Pacific Island Countries*, Report for the South Pacific Regional Environment Programme (SPREP), Apia, Samoa, Published by NIWA Auckland, New Zealand, 36 pp.
- Manton, M.J., Della-Marta, P.M., Haylock, M.R., Hennessy, K.J., Nicholls, N., Chambers, L.E., Collins, D.A., Daw, G., Finet, A., Gunawan, D., Inape, K., Isope, H., Kestin, T.S., **Lefale, P.**, Leyu, C.H., Lwin, T., Maitrepierre, L., Ouprasitwong, N., Page, C.M., Pahalad, J., Plummer, N., Salinger, M.J., Suppiah, R., Tran, V.L., Trewin, B., Tibig, I., Yee, D.: 2001, 'Trends in Extreme Daily Rainfall and Temperature in Southeast Asia and the South Pacific: 1961-1998', *International Journal of Climatology*, **21**, 269-284.





- Clements, W.E., F. J. Barnes, L. Jones, A. Haruta, M. Ivey, and P. **Lefale.**, 2000: The Tropical Western Pacific 2000. In: *The 10th ARM Science Team Meeting proceedings, San Antonio, Texas*. Available online at <http://www.arm.gov/publications/proceedings/conf10/title.stm>
- Clements, W.E., F. Barnes, L. Jones, M. Ivey, A. Koontz, T.P. Ackerman, J.H. Mather, P. **Lefale**, A. Pitcher, and J. Cain., 1999: Nauru – The Second ARM Tropical Western Pacific Site. In: *9th ARM Science Team Meeting Proceedings, San Antonio, Texas*. Available online at; <http://www.arm.gov/publications/proceedings/conf09/title.stm>
- Lefale**, P.F., and CR. Lloyd., 1993: Photovoltaics for Household Energy use in Pacific Island Nations (Fiji Study), Renewable Energy (UK), Vol. **3**, No. 2/3., 153-163.
- Lefale**, P and R. Kay, 1992: Not All a Song and Dance, TIEMPO Issue 5, Published by the International Institute for Environment and Development (IIED), London, UK and University of East Anglia, Norwich, UK. Available online at <http://sunzi1.lib.hku.hk/hkjo/view/13/1300033.pdf>
- Pauga, T., and P.F. **Lefale**, 1988: The History of Tropical Cyclones in Samoa, Apia Observatory, Samoa National Meteorological Services, Mulinuu, Apia, Samoa. (unpublished).

REFERENCES

Dr Peter Kiely, ONZM

Chairman, Pacific Cooperation Foundation
Partner, Kiely, Thompson and Caisley
Barristers & Solicitors, PO Box 7359, Auckland 1141

NEW ZEALAND

Tel: + 64 (9) 366 5110

Email: Kiely@ktc.co.nz

Dr Neil Gordon

Former Permanent Representative (PR) of New Zealand with WMO, Former General Manager, NWS, MetService, NZ

262 Te Waka Road, RD 1, Otaki, 005518

NEW ZEALAND

Tel: +64(29)4700 762,

Email: neil.d.gordon@gmail.com





Dr John Zillman

Former President of WMO, Former Director, Australian Bureau of Meteorology (BoM), Former PR of Australia with WMO.

c/-Australian Bureau of Meteorology

GPO Box 1289, Melbourne VIC 3001

700 Collins Street, Docklands, Melbourne, Victoria

AUSTRALIA.

Tel: +(613) 9669 4000, Fax: +(613) 9669 4699

Email: J.Zillman@bom.gov.au

Dr Howard Diamond

Climate Science Program Manager

US NOAA Air Resources Laboratory (ARL), Atmospheric Turbulence and Diffusion Division

Oak Ridge, TN 37830 (based in Silver Spring, MD), **USA.**

Tel: + (1) 301 427 2475 Fax: + (1) 301 427 0033

Email: howard.diamond@noaa.gov

