CLIMATE AND WEATHER HAZARDS: PACIFIC ISLAND AND OCEAN PERSPECTIVE

CLIMATE AND OCEAN

KEY POINTS

- The ocean drives climate and weather. Increases in extreme weather events with climate change are a threat to Pacific island states – more than 75% of all natural disasters in the Pacific Islands region are caused by severe weather and climate events.[1]
- Extreme weather events threaten key Pacific species and impact coastal marine environments, with resulting impacts on human health and livelihoods. The combination of increased storm severity and sea level rise are putting coastal communities and low-lying islands at greater risk.
- Pacific island countries are highly dependent upon their marine environment for the ecosystem services provided and for marine transport. These are all at risk to increasing storm severity, sea level rise, ocean warming, and ocean acidification.
- Pacific resilience to extreme events and cost-effective maintenance of ecosystem services depends on healthy marine and coastal ecosystems, integrated with terrestrial management, and ecosystem-based adaptation.[2,3]

HOW ISSUE LINKS TO/IMPACTS SDGs BEYOND SDG14 LIFE BELOW WATER

- SDG1, 2,3: Poverty reduction, food security and health in the Pacific depend on local agriculture and shoreline fisheries, threatened by extreme events. In particular, note SDG1.5 – 'build the poor's resilience to climate change and other shocks'
- SDG5, 10: The impacts of disasters are uneven across gender and location, with impacts more strongly felt by developing nations.
- SDG6: Freshwater and sanitation systems are threatened by storms, inundation and salinization.
- SDG9, 11: Resilient infrastructure and sustainable cities and communities rely on an understanding of, adaptation to, and mitigation of extreme events.

BACKGROUND

1. **Pacific island countries and territories are highly vulnerable to natural disasters and climate hazards**, putting at risk the development gains made in recent years. There is a need to ensure responses are better understood, planned for, funded, and coordinated at local, national, regional, and international levels. The Pacific Islands Forum Leaders endorsed the 2016 Framework for Resilient Development in the Pacific, recognising the links between climate change and disaster risk reduction and that an integrated approach is more effective.
2. **Weather and climate affect us all**, not just subsistence economies. According to the Platform on Disaster Displacement, in 2008 to 2014, an annual average of 22.5 million people were displaced by weather- and climate-related sudden-onset extreme hazards.
3. **Meteorology and early warning systems rely on ocean data** for both land and coastal/marine weather forecasting. Coastal inundation has been identified as a priority by regional National Meteorological & Hydrological Services. There is a need for increased training in oceanography and ocean observing for multiple sectors.
4. **Natural environments protect development.** Hard engineering solutions can alter ecosystems[4] and merely delay or worsen, not prevent, expensive infrastructural damage. Seawalls can increase beach erosion and create a false sense of safety.[5] Restoration and protection of wetlands is the most cost-effective method for shoreline and coastal resilience.[2]

SPREP PROE

UN environment

5. **Invasive species make a given environment more susceptible to damage**. Just as invasive trees are more likely to fall during storms and forests are taken over by weeds after storms, marine systems are more susceptible to invasion under the stress of extreme events, and their recovery is weakened. Pacific marine invasives are understudied.

6. **Climate change is a concern of today**. Some Pacific islands have four times greater sea-level rise than the global average of 3.2 millimetres (mm) sea-level rise per year. Communities have been displaced and islands lost due to sea level rise.[6] In 2016, high sea temperatures caused fish-kills in Fiji and Vanuatu and led to a global coral bleaching event. Ocean acidification and temperature rise are threatening Pacific environments, fisheries, and islands through loss of shoreline protection by reefs, a key component of natural disaster resilience.

7. **Climate change is driving more severe storms**. In the past two years, the region experienced two devastating cyclones. For example, Cyclone Winston impacted the livelihoods of 62% of Fiji's population, while damaging reefs and local fisheries.[7] Fish consumption dropped, especially at schools, with potential impacts on the children's nutrition.[3] Such storms threaten humans, other species, and infrastructure as well as underwater cultural heritage, with increased risk of oil pollution from damage to submerged WW II wrecks.

8. **Capacity to measure, plan, adapt, and respond is limited in Pacific island countries.** Climate change adaptation could cost USD 500 billion per year by 2050 in developing nations.[8] By acting sooner, the costs of adaptation can be minimised and if we act now, adaptation, protection, and restoration options remain viable.[9] Business as usual approaches to development increase the risk to infrastructure, communities, and livelihoods and will result in high costs and losses.

1 SPC, SPREP, PIFS, UNDP, UNISDR and USP. Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management [FRDP] 2017 – 2030

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3 Intertwined ocean and climate: implications for international climate negotiations 2015. IDDRI, IAEA, and partners.

4 Gittman et al. 2016. Ecological Consequences of Shoreline Hardening: A Meta-Analysis. BioScience 66:763–773

5 Nateghi et al. 2016. Statistical Analysis of the Effectiveness of Seawalls and Coastal Forests in Mitigating Tsunami Impacts in Iwate and Miyagi Prefectures. PLOS ONE 11:e0158375

6 Albert et al. 2016. Interactions between sea-level rise and wave exposure on reef island dynamics in the Solomon Islands. Environ Res Lett 11:054011

7 Chaston Radway et al. 2016. Impact of Tropical Cyclone Winston on fisheries-dependent communities in Fiji. Report No. 03/16. Wildlife Conservation Society, Suva

8 UNEP. 2016. The adaptation gap report 2016.

9 Gattuso et al. 2015. Contrasting futures for ocean and society from different anthropogenic CO_2 emissions scenarios. Science 349:6243