

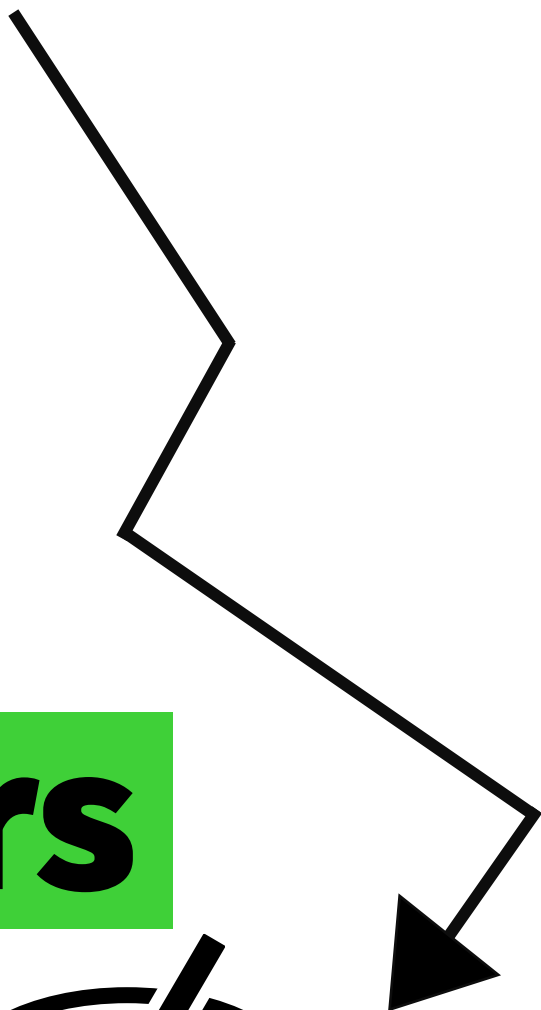
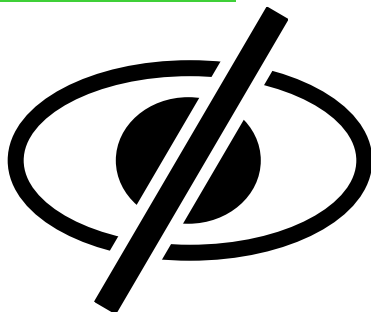
The

Trend

the

Outliers

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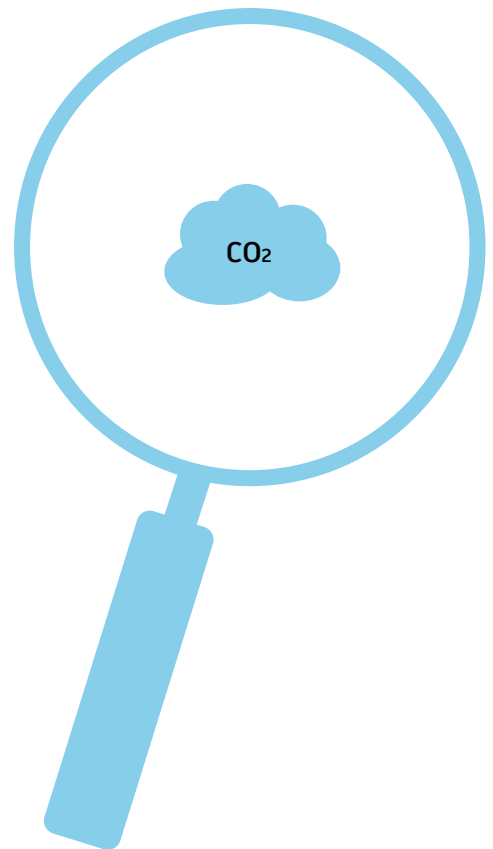
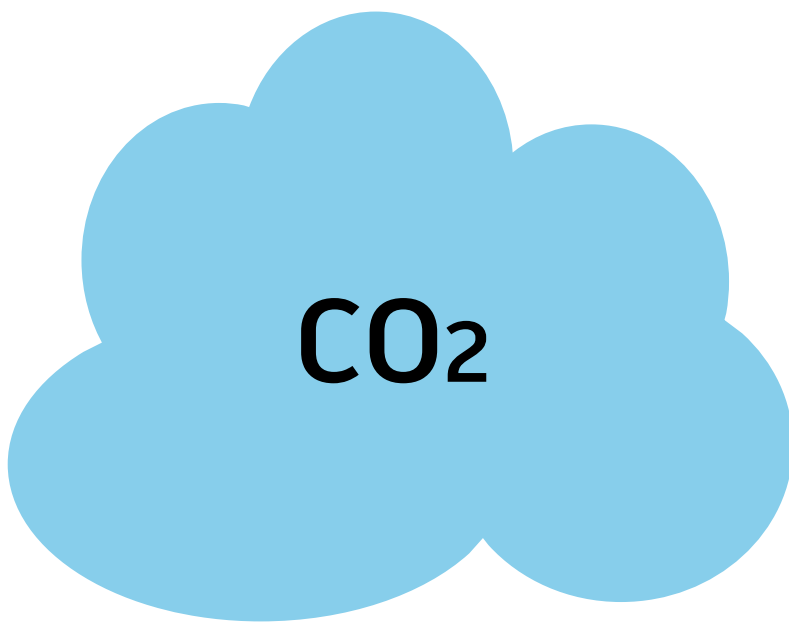


BY: KENDRICK TETEVİ

Introduction



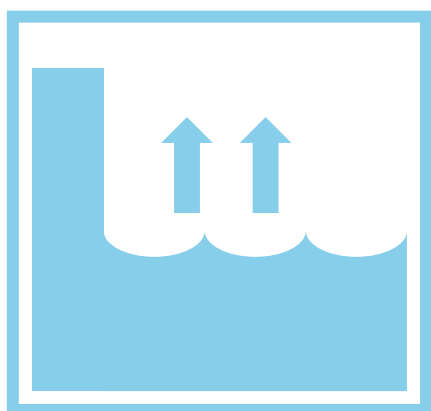
Pacific Island countries contribute only a small share of global greenhouse gas emissions.



GLOBAL CO₂ EMISSIONS COMPARED TO PACIFIC
ISLAND COUNTRIES (NOT DRAWN TO SCALE)

Yet they are among the region's most vulnerable to climate change, facing rising sea levels, more frequent extreme weather events, coastal erosion, and the degradation of marine ecosystems.

IMPACTS OF CLIMATE CHANGE



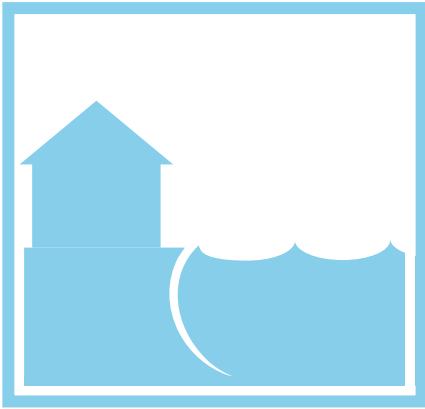
Sea level in the western tropical Pacific has risen 10–15cm since 1993 – close to twice the global rate. Some Pacific island countries experience up to four times greater sea level rise than the global average. Many atoll nations sit just 2–3 metres above sea level.

Source: WMO State of the Climate in the South-West Pacific (2024); SPREP Sea Level Rise Fact Sheet



In 2023 alone, 34 extreme weather events caused over 200 deaths and affected more than 25 million people across the South-West Pacific. In 2022, economic damage from storms and floods reached \$9 billion – four times higher than the previous decade's average.

Source: WMO State of the Climate in the South-West Pacific (2024)



The IPCC projects sea levels will rise 0.61–1.10 metres by 2100 under high emissions, driving widespread coastal flooding, shoreline retreat, and saltwater contamination of freshwater supplies across Pacific island nations. In Small Island Developing States, one in five disasters already wipes out more than 5% of GDP.

Source: IPCC Special Report on the Ocean and Cryosphere (2019); WMO / UN News (2023)



Global coral cover has fallen from approximately 60% to under 20% over the past 30 years. The 2023–2025 bleaching event – the largest on record – affected 84% of the world's reefs. In Funafuti, Tuvalu, 70% of corals inside the lagoon were reported gone by early 2024. Marine heatwaves have doubled in frequency since 1980.

Source: NOAA Coral Reef Watch (2024); earth.org; WMO (2024)

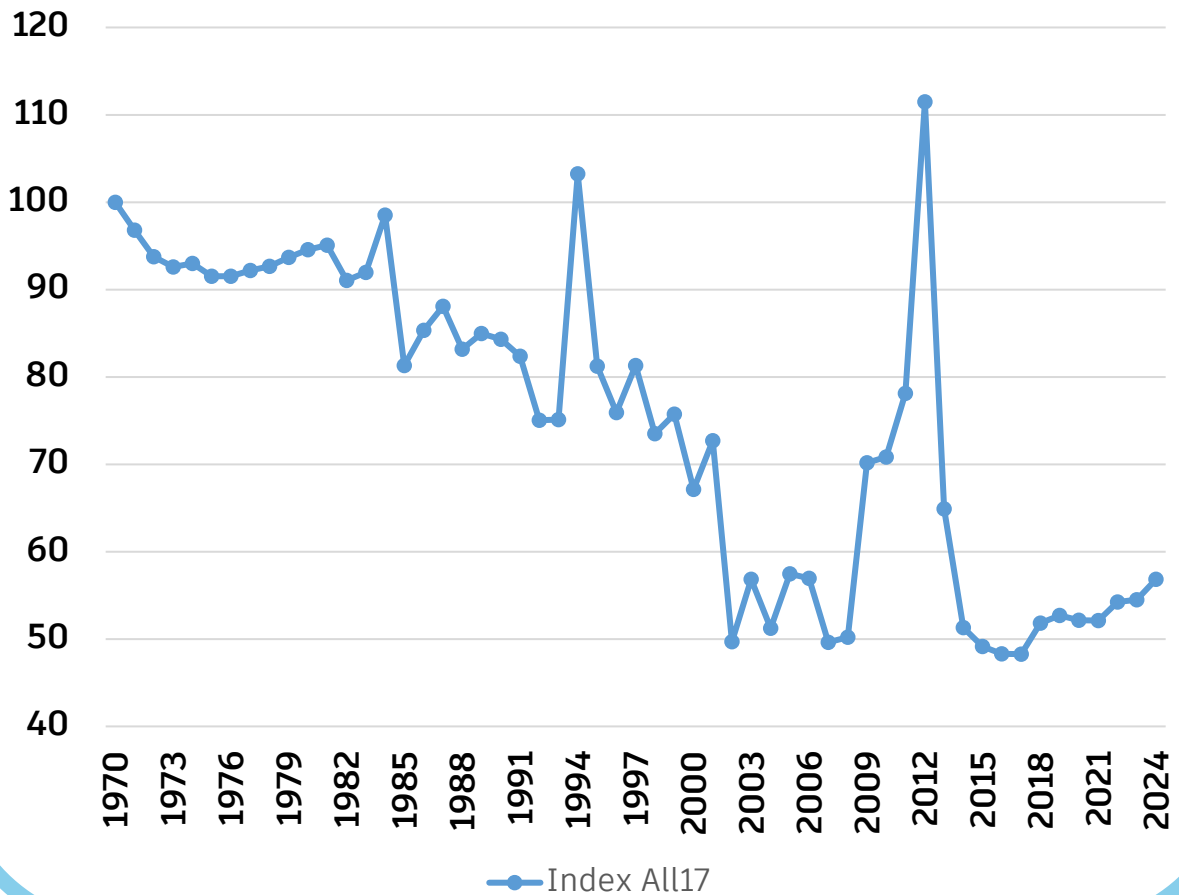
These impacts underscore the urgency of both global and regional climate action.

Using the Pacific Data Hub's greenhouse gas emissions per capita dataset (1970–2024) for 17 Pacific Island countries and territories, I calculated the regional average greenhouse gas emissions per person.



PACIFIC DATA HUB

At first glance, the results appear encouraging: the average falls by approximately 43% over the five-decade period.



LINE CHART SHOWING ALL 17 PACIFIC ISLAND NATIONS

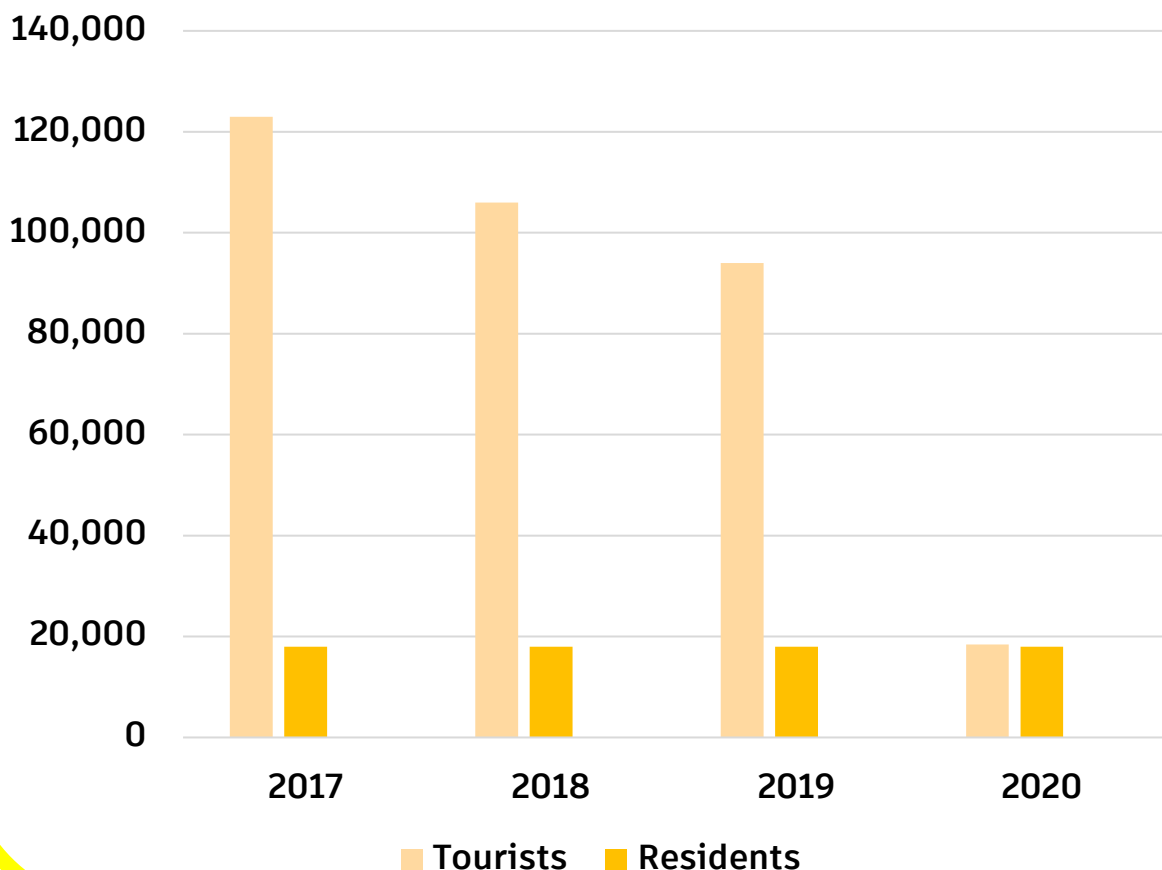
This seems like a success story. However, a closer examination reveals that the apparent decline is heavily influenced by two statistical outliers.

The Outliers



The regional average is dominated by Palau and New Caledonia, whose exceptionally high per-capita emissions differ substantially from those of the other Pacific Island nations.

Palau's emissions are unusually high because the country's very small resident population (around 18,000 people) is used as the denominator for emissions generated by an economy heavily supported by international tourism.



PALAU – TOURIST ARRIVALS VS RESIDENTS

In 2017, Palau welcomed 123,000 tourists against a resident population of just 18,000 – a ratio of nearly 7 to 1. Tourist transport emissions, divided by that small resident headcount, produce one of the world's highest per-capita greenhouse gas figures. The number is a measurement artifact, not a reflection of how residents live.

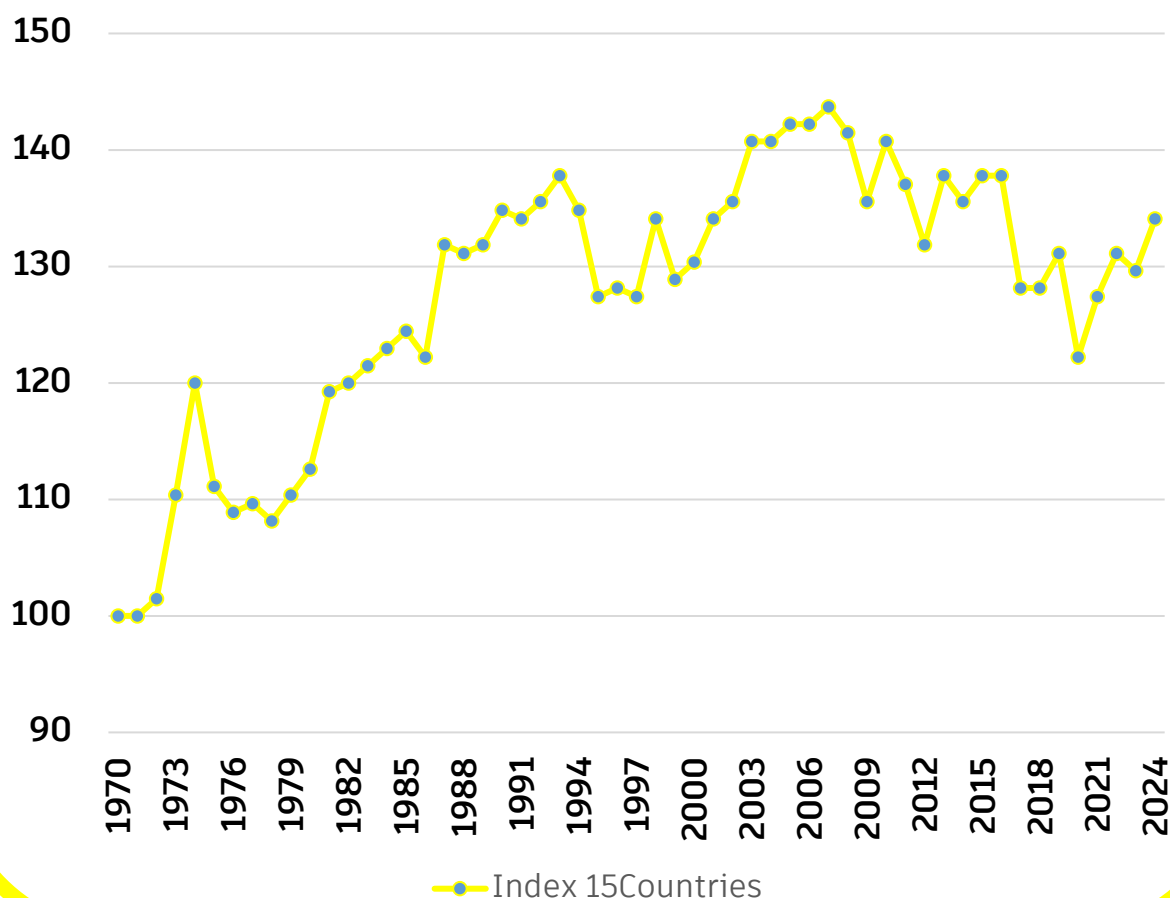
Source: Pacific Data Hub Tourist Arrivals dataset (SPC_DF_TOURISM_ARRIVALS_1_0); IMF Republic of Palau: Selected Issues (2023)

This results in one of the world's highest greenhouse gas emissions per capita. In other words: divide a tourist's footprint by a local's population, and the math gets dramatic fast.

New Caledonia's emissions are similarly exceptional, largely due to its energy-intensive nickel industry, particularly nickel smelting, which contributes disproportionately to the territory's greenhouse gas emissions relative to its population.

Nickel refining accounts for 75–80% of New Caledonia's total energy consumption, predominantly powered by fossil fuels. The Doniambo plant alone – a 160MW heavy fuel oil facility – supplies the SLN pyrometallurgical nickel smelter. One industrial site, visible in an entire territory's per-capita emissions figure.
Source: NZ MFAT New Caledonia Energy Review (2022); Nouvelle-Calédonie Énergie; Global Energy Monitor

When these two outliers are removed from the analysis, a different pattern emerges.



LINE CHART SHOWING 15 PACIFIC ISLAND NATIONS (EXCLUDING PALAU AND NEW CALEDONIA)

Rather than declining, the average greenhouse gas emissions per capita across the remaining 15 Pacific Island countries increase by approximately 34% between 1970 and 2024.

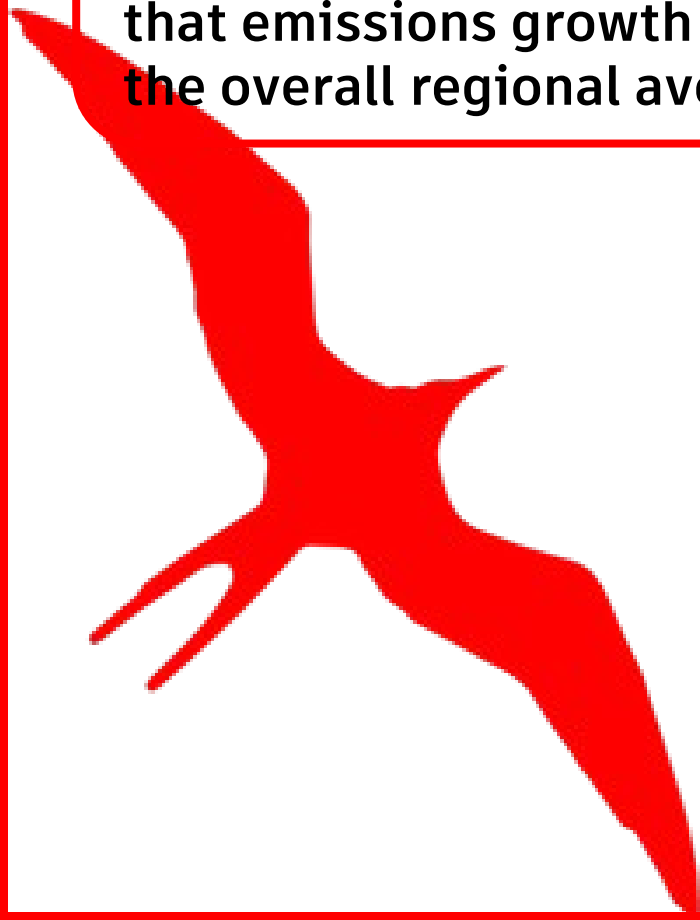
**This illustrates an important statistical lesson:
averages can sometimes obscure the broader
pattern when a small number of extreme
observations dominate the dataset**

Conclusion



Reducing emissions in Palau and New Caledonia remains important. However, focusing solely on these two high-emitting outliers risks overlooking a broader regional trend.

Across the other Pacific Island countries, per-capita greenhouse gas emissions have risen gradually over the past five decades, suggesting that emissions growth is more widespread than the overall regional average initially suggests.



The story is therefore not that the data are misleading, but that the regional average masks two very different realities: exceptionally high emissions in two territories and a slower but persistent increase across the remaining Pacific nations.

Materials and Methods



Data source: Pacific Data Hub greenhouse gas emissions per capita dataset (1970–2024).

Supporting datasets: Pacific Data Hub Tourist Arrivals dataset (Palau, 2017–2020).

Methodology: I compared the average greenhouse gas emissions per capita across all 17 Pacific Island countries and territories with the average after excluding two statistical outliers (Palau and New Caledonia).

Two countries were treated as statistical outliers – not because they did anything wrong, but because averages don't appreciate drama. The average used is an unweighted arithmetic mean – each country contributes equally to the calculation regardless of population size.

Contextual sources: Explanations for the drivers behind each outlier were informed by IMF (2023), *Republic of Palau: Selected Issues*; the European Commission's *Clean Energy for EU Islands* New Caledonia profile; the New Zealand Ministry of Foreign Affairs and Trade *New Caledonia Energy Review* (2022); and the Global Energy Monitor's Doniambo Power Station entry.

Impact statistics drawn from the World Meteorological Organization *State of the Climate in the South-West Pacific* (2024), SPREP Pacific Islands Sea Level Rise Fact Sheet, IPCC *Special Report on the Ocean and Cryosphere* (2019), and NOAA Coral Reef Watch (2024).

Analysis, visualisation, and interpretation are my own. AI was used to assist with data exploration and copy editing.