



## Impacts of tropical cyclones on Fiji and Samoa

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Weather and climate hazards have significant impacts on Pacific Island Countries. Costs of hazards such as tropical cyclones can be astronomical making enormous negative economic impacts on developing countries.

We highlight examples of extreme weather events which have occurred in Fiji and Samoa in the last few decades and have caused major economic and social disruption in the countries. Destructive winds and torrential rain associated with tropical cyclones can bring the most damaging weather conditions to the region causing economic and social hardship, affecting agricultural productivity, infrastructure and economic development which can persist for many years after the initial impact.

Analysing historical data, we describe the impacts of tropical cyclones Bebe and Kina on Fiji. Cyclone Bebe (October 1972) affected the whole Fiji especially the Yasawa Islands, Viti Levu and Kadavu where hurricane force winds have been recorded. Nineteen deaths were reported and damage costs caused by cyclone Bebe were estimated as exceeding F\$20 million (F\$ 1972). Tropical cyclone Kina passed between Fiji's two main islands of Viti Levu and Vanua Levu, and directly over Levuka on the night of 2 January 1993 with hurricane force winds causing extensive damage. Twenty three deaths have been reported making Kina one of the deadliest hurricanes in Fiji's recent history. Severe flooding on Viti Levu, combined with high tide and heavy seas led to destruction of the Sigatoka and Ba bridges, as well as almost complete loss of crops in Sigatoka and Navua deltas. Overall, damage caused by cyclone Kina was estimated as F\$170 million.

In Samoa, we describe devastation to the country caused by tropical cyclones Ofa (February 1990) and Val (December 1991) which were considered to be the worst cyclones to affect the Samoan islands since the 1889 Apia cyclone. In Samoa, seven people were killed due to cyclone Ofa, thousands of people were left homeless and entire villages were destroyed. Damage on Samoa totalled to US\$130 million. Cyclone Val caused damage and destruction to 95% of houses in Samoa and severe crop damage; total damage was estimated as US\$200 million.

Recently, severe tropical cyclone Evan affected Samoa and Fiji (December 2012). Significant progress in operational tropical cyclone forecasting has been achieved over the past few decades which resulted in improving early warning system but death toll attributed to cyclones is still high – at least 14 deaths in Samoa are related to cyclone Evan (luckily, no death reports in Fiji). Cyclone-related economic losses also remain very high making significant negative impact on economies of the countries. Preliminary assessment of damage caused by cyclone Evan in Fiji indicates loses of about \$75.29 million.

By the end of this century projections suggest decreasing numbers of tropical cyclones but a possible shift towards more intense categories. In addition, geographic shifts in distribution of tropical cyclone occurrences caused by warming of the atmospheric and oceanic environment are possible. This should be taken in consideration by authorities of the Pacific Island Countries when developing adaptation strategies to increasing tropical cyclone risk due to climate change.