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### **Climate Change's Impact on Food Insecurity in Fiji**

Fiji is an island group in the South Pacific Ocean, consisting of an archipelago of 333 islands and 540 smaller islets scattered over about 1,000,000 square miles. Of the over 300 islands, 100 are inhabited, with most people living on the two largest islands, Viti Levu and Vanua Levu. Fiji's population is 931,070 (Worldometer, 2025). 41.29% of people in Fiji live in rural areas, while 58.71% live in urban areas. Unfortunately, 10.2% of the population faces food insecurity. Fiji has a parliamentary democracy with the Prime Minister as the authority of government (Australian Government, n.d.)

The average farm size is 2.35 hectares or 5.8 acres. According to Trading Economics (2025), 17.06% of land is currently being cultivated for agricultural reasons. Major exports in Fiji are sugarcane, kava, papaya, pineapple, mango, cassava, and yams. Sugarcane plays a vital role in the economy. The sugar industry not only provides livelihoods for thousands of Fijians but also contributes about 15% of total export earnings (Trading Economics, 2025).

Fiji has a tropical rainforest and tropical monsoon climate, as the islands are split. They have warm temperatures year-round, high humidity, and frequent tropical cyclones (Macrotrends, n.d.). Fiji's capital, Suva, on the eastern more "wet" side of Viti Levu, averages 120 inches of rain annually. The western and northern sides of the island are drier and sunnier. Fiji also has rocks forming the interior hills and volcanic rocks of the coast (Foye, 1917).

The average family size in Fiji is 3.96. Fijians work mostly in tourism and agriculture, including housekeeping, food and beverage, farming, and marine activities (GlobalDataLab, 2023). The average wage for full-time employment typically ranges from FJD 1,200 to FJD 2,000, or USD 515.16 to USD 858.60 (VisitWorld, n.d.). Rice, sweet potatoes, taro, coconuts, cassava, breadfruit, and fish have made up most of the Fijian diet for centuries (Southern Cross Travel Insurance, n.d.). Families get food from local markets, where they cook it using a method called "lovo," which involves an underground oven where food is wrapped in banana leaves and slow-cooked on hot stones. (Backe, 2014). According to CountryReports (n.d.), education and healthcare are accessible, in most cases free, and affordable in certain parts of Fiji.

However, those living in rural areas are farther away from more advanced medical centers. Staff training is limited and there can be shortages of medicine and supplies in these areas, so although healthcare is affordable and accessible, it can be more limited in certain regions. (Khan, 2022). Additionally, infrastructure such as clean water, toilets, electricity, telephones, roads, and local markets can vary in urban and rural areas. Around 82% of Fiji's population has access to safe drinking water. Only 28% of the population can access the central sewerage system (International Trade Administration, 2024). Many rural communities do not have full access to electricity. However, most people in these rural areas have at least a few hours of electricity a day provided by a generator (Peace Corps, n.d.)

In Fiji, various cultural and social factors influence the lives of typical families, including gender roles, extended family systems, and the frequent occurrence of extreme natural disasters. Women are often

encouraged to prioritize domestic responsibilities, which limits their opportunities for education and employment (Evason, 2016). On the other hand, the extended family system fosters a sense of communal support and enhances resilience in the face of natural disasters. These cultural values demonstrate Fiji's dedication to integrating traditional practices with modern approaches to combat climate change. For example, communities have begun planting mangroves through international climate adaptation programs to protect against coastal erosion (Barnes, 2024). Such initiatives highlight Fiji's commitment to blending its cultural heritage with innovative solutions to address the challenges posed by climate change.

Fiji is considered one of the most vulnerable countries globally to climate change, with worsening conditions (Environmental Protection Agency, 2024). Human activities have dramatically increased the presence of atmospheric greenhouse gases, primarily through the burning of fossil fuels over the past 150 years. Logging and development have led to the widespread destruction of forests, wetlands, ecosystems, and other carbon sinks. Overconsumption has caused additional harm to both humans and the environment (Turrentine, 2022). The natural processes include volcanic eruptions, variations in solar radiation, and the movement of crustal plates (Climate Science Investigations, 2023).

This immensely affects communities in Fiji. According to the Pacific Islands Climate Change Assistance Programme (PICCAP) & Fiji Country Team (2005), over 90% of the population, both rural and urban, can be considered coastal dwellers, making them extremely defenseless against rising sea levels, coastal erosion, natural disasters, and disruption to agriculture. The Environmental Protection Agency (2024) states that people living on floodplains, coastlines, or in areas prone to severe storms are more vulnerable to extreme weather. Those living in poverty may be less able to prepare for or respond to extreme events. As a result, these individuals are expected to have greater impacts from climate-related hazards. Specifically, socially vulnerable people, indigenous populations, older adults, people with chronic medical conditions, people with disabilities, and workers. Pregnant, breastfeeding, and postpartum women are most at risk.

Sindra (2014) of the London School of Economics, estimates that across the Pacific Islands, home to 10 million people, up to 1.7 million could be displaced due to climate change by 2050. Fiji's 300 volcanic islands include low-lying atolls (ring-shaped coral reefs, islands, or series of islets surrounding a lagoon) that are highly susceptible to cyclones and floods. Due to this, Fiji is no stranger to the devastation caused by climate change (United Nations Climate Change, 2017). These environmental challenges are closely linked to food insecurity, as they disrupt agriculture, fisheries, and access to freshwater resources. Addressing the environmental impacts of climate change is not only vital for Fiji's ecosystems but also the well-being of its communities.

Rising sea levels are a critical concern for coastal communities in Fiji. Over the past 30 years, sea levels have risen 29 cm in Suva, with an estimated increase of 18 cm over the next 30 years (NASA, 2024). This climate crisis means that dozens of villages could soon be underwater (Lyons, 2022). Rising sea levels lead to coastal flooding during storm surges, economic impacts, and degradation of agriculture, all of which are a major concern. In 2012, Vunidogoloa became the first village to begin relocating to higher ground due to sea-level rise as a result of climate change (Meakins, 2012). The issue with this was that the community was divided, as some wanted to stay while others decided to move. This was due to the lack of preparation.

Another significant factor affecting Fiji's environment is cyclones, floods, and droughts (United Nations Climate Change, 2017). Recurring weather events are destroying vital public infrastructures such as electricity and water stations, roads, schools, and hospitals. For instance, Tropical Cyclone Winston in

2016 incurred US \$1.3 billion in economic losses, including US \$700 million in damages and US \$600 million in losses (Singh & Cooke, 2022). This Cyclone destroyed the forests, crops, and ecosystems of Fiji. With much of the farmland destroyed, food security remained an issue for many communities. Efforts to replant crops and restore farming practices were slow, and it was expected to take years for the agricultural systems to fully recover (Ingram, 2024). As these events become more frequent due to climate change, Fiji must prioritize resilient infrastructure, disaster preparedness, and sustainable agricultural practices to protect its communities and ensure long-term food security.

Fiji's neighboring country, New Zealand, is also taking proactive measures to combat climate change, as both nations face significant challenges from rising sea levels and extreme weather events. Like Fiji, they often collaborate on international initiatives to address this. (Banjo, 2024). Notably, New Zealand has been a global leader in sustainable agriculture. Almost half of New Zealand's greenhouse gas emissions come from agriculture, so the government enforced The Climate Change Response (Zero Carbon) Amendment Act. This puts in place targets to reduce net emissions of greenhouse gases to zero by 2050 (NIWA, n.d.).

They've also been pioneers in regenerative agriculture, specializing in rotational grazing since the 1970s. The quality of New Zealand pastures allows both sheep and cattle to graze in the same pastures at different stages of the grazing process, utilizing the pastures at maximum efficiency with minimal need for agricultural inputs like fertilizer, feed, or other chemicals (Fulmer, 2023). If Fiji implemented a similar solution, it would be highly beneficial for enhancing its agricultural productivity and reducing the environmental impact. By adopting regenerative agricultural practices, Fiji could improve soil health, increase crop yields, and reduce reliance on chemical fertilizers, which are costly and often harmful to the environment.

To solve climate change, Fiji should invest in climate-resilient infrastructure and utilize international collaboration through the Green Climate Fund to accelerate the transition to renewable energy sources such as solar, wind, and hydroelectric power to reduce reliance on imported fossil fuels. It is essential to prepare Fijians for the permanent consequences of climate change. This will reduce their reliance on imported fossil fuels and strengthen the country's ability to withstand and recover from the devastating impacts of natural disasters.

Developing climate-resilient infrastructure is essential for protecting Fiji's agricultural systems, homes, and public services. This includes building storm-resistant housing, elevating roads to prevent flood damage, and protecting water and power systems. This ensures that vital services like healthcare, education, and agriculture remain operational during disasters. In the event that communities need to be relocated in the future, this process would be more efficient and less disruptive for Fijians.

Implementing these cyclone-resistant architectural designs can help prevent the widespread destruction seen during events such as Tropical Cyclone Winston in 2016, which caused catastrophic damage to homes, schools, hospitals, and agriculture (Di Liberto, 2016). This type of infrastructure will prepare Fiji for the worsening impacts of climate change and minimize the economic and social disruptions caused by natural disasters. Previous mangrove restoration efforts by local Fijians have also been proven to lessen the impact of the disruption of land and the protection of marine areas. Mangrove forests are the ultimate 'fully natural' nature-based solution to the impacts of climate change including extreme weather events and food insecurity. (Community Centred Conservation Limited, n.d.) Implementing these important mangrove forests into oceans helps buffer strong waves, restore eroding beaches, and reduce the impacts of sea level rise and storm surges.

Additionally, utilizing international collaboration, such as funding from the Green Climate Fund, to accelerate the transition to renewable energy sources such as solar, wind, and hydroelectric power to reduce reliance on imported fossil fuels would be transformative for the islands of Fiji. By expanding renewable energy projects, such as solar farms, wind turbines, and hydroelectric plants, Fiji can generate clean, sustainable energy domestically. The \$30.51 million investment Fiji secured through the Green Climate Fund in 2023 provides an excellent foundation to scale up these efforts, including the development of solar energy projects and upgrades to aging energy infrastructure (Green Climate Fund, n.d.). Its plan will provide clean and affordable energy solutions to 100% of the island by 2036 (Jiles, 2023). Powering irrigation systems through solar, wind, or hydroelectric energy would make agricultural operations more cost-effective and environmentally friendly.

By partnering with neighboring nations such as New Zealand, Fiji can benefit from shared knowledge and resources. New Zealand's success in regenerative agriculture and its Climate Change Response Amendment Act provide valuable insights into achieving sustainable development while reducing greenhouse gas emissions. (NIWA, n.d.) As previously stated, New Zealand's sustainable agriculture strategy, which utilizes rotational grazing, can be adapted to Fiji's unique landscape by integrating it with renewable energy resources. By implementing these renewable energy advancements, Fiji can significantly reduce its reliance on fossil fuels and lower greenhouse gas emissions to mitigate the impacts of climate change.

While developing this plan, it is important to understand the limitations to this approach. This includes the high costs associated with transitioning to renewable energy and implementing sustainable agriculture practices. Initial investments in infrastructure, such as solar panels, wind turbines, and irrigation systems, can be costly for a developing nation like Fiji. Additionally, future maintenance and training local communities to operate and manage these systems require significant financial and technical resources. Geographical constraints also play a vital role in this. Fiji's vast archipelago can make it challenging to deliver and maintain infrastructure across so many islands, particularly in areas with limited transportation and communication. Not only that, but the susceptibility to extreme weather events can further complicate the implementation of these renewable energy systems and sustainable farming practices. Despite these limitations, the long-term benefits of food security, environmental protection, and resilience to climate change make this approach a worthy investment.

To effectively implement these recommendations, the Government of Fiji would be responsible for managing and leading the project. This would also involve the Ministry of Environment and Climate Change, the Department of Energy, and the Ministry of Agriculture, all working together to develop and enforce policies that align with the goals of sustainable development. Additionally, local community leaders can advocate for the project and engage their communities in the process, while international development organizations can provide funding and expertise to ensure successful execution. Partnerships with universities would also be critical for gathering data, conducting research, and integrating traditional values with modern science. For this project to be successful, there would also need to be policies in place to protect the coast, marine areas, and the land. These policies should promote conservation, sustainable resource management, and the protection of critical ecosystems that are vital for food security and resilience to climate change.

Finally, Fiji's unique natural resources provide a strong foundation for renewable energy development. Their tropical climate provides consistent sunlight and wind for renewable energy. These natural resources provide a strong foundation for renewable energy development to be used in solar panels,

windmills, or hydroelectric power. The country's coastal mangrove forests also act as natural carbon sinks and protect coastal communities from storm surges. By restoring and expanding these ecosystems, Fiji can not only mitigate climate change impacts, but also create sustainable livelihoods for its people (Wycliffe, 2022).

Overall, this approach is both sustainable and feasible. It utilizes Fiji's existing natural resources, including solar energy, wind, hydropower, and mangrove ecosystems, to create a more resilient country. By integrating traditional knowledge with modern technologies and prioritizing community engagement, Fiji can build a sustainable future for climate adaptation and regenerative agriculture. While the costs may be high, the long-term benefits of increased energy security, improved food production, and enhanced climate resilience will contribute to a prosperous and sustainable future for all Fijians. By focusing on a comprehensive approach that incorporates renewable energy, sustainable agriculture, gender equality, and strong policy frameworks, Fiji can lead the way in addressing climate change and food insecurity while protecting the health and well-being of its people.

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