

Proposal for Better Disaster Risk Management in Fiji

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1.0 Introduction

Fiji is a Pacific island nation that is part of Melanesia, one of the three primary cultural areas that make up Oceania's geographical region. The country is an archipelago state made up of 332 primarily volcanic islands, 110 of which are permanently inhabited. Fiji's islands cover an area of 18,274 km²; however, the two largest islands, Viti Levu and Vanua Levu account for 85 percent of the total (CBD, 2018). Thus, despite the country's entire territory being about 50,000 km², most of the population is concentrated in the two largest islands and urban centers (Government of Fiji, 2016).

The country is divided into four administrative divisions: Northern, Eastern, Central, and Western, each of which is overseen by a commissioner in charge of coordinating governmental activities in their respective districts (Rahman & Singh, 2011). In addition, these divisions are made up of 14 provinces, each led by a Provincial Officer at the local government level and overseen by the Ministry of Local Government, Housing, and Environment. The indigenous Fijian communities' governance obligations, on the other hand, are delegated to the Ministry of iTaukei Affairs at the national level (Winterford & Gero, 2018).

Fiji's islands feature a diverse ecosystem; woods comprise around 52 percent of the continent, containing unique species not found anywhere else on the earth. Fiji is home to half of the flora and 90 percent of the insect species (CBD, 2018). The islands and nearby reefs also sustain unique marine ecosystems that have yet to be fully explored. Fiji has one of the most established and fastest-growing economies among the Pacific Islands Nations, with tourism and sugar cane exports as the fastest-growing sectors (Jayaraman et al., 2018). Tourism accounts for more than 10% of overall GDP, and it is projected that the direct and indirect effects of tourism on economic growth could equal more than 30%. (Fiji Bureau of Statistics, 2016). It also serves as a regional center for Pacific island services such as airplanes and shipping. However, the economy continues to face difficulties due to

climate change, natural disasters, and external shocks, the effects of which are exacerbated by the remoteness of the island and its reliance on sensitive agricultural exports and tourism (Government of Fiji, 2016).

2.0 Statement of the Challenge in Fiji.

2.1 Climate-related natural disasters and climate change in Fiji

The South Pacific Convergence Zone (SPCZ) and the El Niño Southern Oscillation (ENSO) are primary drivers of climatic fluctuations in the region, which frequently expose Fiji to various risks related to weather (Government of Fiji, 2018). Fiji is also categorized as a high-risk country for earthquakes due to its proximity to the Pacific Ring of Fire (GFDRR, 2019). In addition, there are two active volcanoes in Taveuni, which are expected to explode within the next several years (Cronin et al., 2001). Tsunamis are also a concern in areas where tectonic fault systems are active and prone to earthquakes (Prevention Web, 2017).

Flooding is a common occurrence in the Fiji Islands during the monsoon season, resulting in fatalities and damage to infrastructure, crops, and livelihoods (Yeo et al., 2010). The majority of catastrophic flood events occur in low-pressure zones, frequently in conjunction with cyclones and tropical storms, which bring in high-intensity rainfall and cause flash flooding and landslides. On the other hand, flooding is more severe in Fiji's delta regions, where high spring tides combine with the passage of tropical disturbances, especially during the La Niña years (Yeo et al., 2010).

Due to a combination of excessive precipitation, powerful gusts, and eroding steep slopes, landslides are a risk on several of the islands (Drazba et al., 2018). They've also been designated as one of the most severe hazards to human life, accounting for about a quarter of all disaster-related deaths each year and significantly impacting communities and livelihoods (Drazba et al., 2018). Droughts are also common in the country, and they are frequently associated with El Niño events, which can cut yearly rainfall by up to 50%. In addition, droughts have a lot of spatial variabilities. Therefore they're more likely to have regional repercussions in drought-prone areas like Viti Levu's west (Government of Fiji, 2018).

Human health effects are also projected to be severe since dengue and typhoid fever are expected to become more frequent as the likelihood of yearly outbreaks rises due to climate change (Jenkins, 2017). In addition, the unique marine natural systems, which are home to approximately 1,200 fish species, 1,000 invertebrates, and roughly 1,000 coral reefs, are also threatened by bad weather, habitat degradation, and anomalies in water temperature (CBD, 2018).

2.2 Exposure to natural disaster and climate change in Fiji

Although more than half of Fiji's population lives in or near cities, the consequences of sea-level rise are felt across the country due to coastline erosion and groundwater salinization (Martin et al., 2018). For example, Fiji's sea level rose at a rate of 5.5 millimeters per year between 1992 and 2009, twice the global average (Wairiu et al., 2012). Such change can jeopardize groundwater availability, and given some islands' low elevation, the threat to buildings and towns is also severe; currently, around 38% of the population and 19% of all economic activity are classified as having a high or very high flood effect (The World Bank, 2016).

Because of the region's unstable soil conditions, considerable precipitation, and strong winds, landslides are a significant risk in any place with steep slopes. The hazards have increased due to a lack of awareness of soil stability and unsustainable farmland development and dwellings in vulnerable locations (Drazba et al., 2018). Along with the dangers of tsunamis, earthquakes, flooding, cyclones, and severe weather, the country is also home to two active volcanoes (Wilkinson et al., 2016). According to Cronin et al. (2001), 14,500 people live on Taveuni Island, home to an active basaltic shield volcano with a high probability of reactivation over the next 50 years (2001). In addition, due to the composition of the magma deposits and weak rock zones, which frequently collapse during seismic activity, volcanic sites such as the Nabukelevu dormant volcano are also prone to failures, with the potential to cause significant landslides (Cronin et al., 2004).

Typhoid fever exposure is typically enhanced after cyclones and in places with inadequate water hygiene and sanitation standards, where drinking water is obtained from creeks and rivers, where people have a low socio-economic position, and where living circumstances are crowded (Jenkins, 2017). In addition, rainfall-induced flooding and proximity to rivers increase the risk factors, as demonstrated following Cyclone Winston, when a typhoid outbreak swept across north-eastern Viti Levu (de Alwis et al., 2018).

2.3 Socio-economic vulnerability of natural disaster and climate change in Fiji

Loss of livelihood is a serious problem, especially for low-income families who rely on farming and small-scale artisanal operations for a living. Moreover, the disaster's effects trickle out to households that lose their primary means of income, such as crops or fishing equipment, perhaps causing children to drop out of school or jeopardizing food security in isolated regions. Furthermore, the high demand for skilled workers in luxury resorts may exclude local populations from the tourism industry, causing income leakages outside of the country. In addition, poverty has several gendered aspects to it; for example, after the cyclone Winston, females in the Bua Province experienced issues related to finance as they had few options for income diversification because their access to the mangrove forest to catch mud-crabs were disturbed or they lost their fishing equipment (Thomas et al., 2018).

Overall, women make up only 33% of the economically active population, earn less than men, and 64% of working women fall below the conservative poverty line (ADB, 2014). Finally, the loss of traditional knowledge may have contributed to greater disaster vulnerability. Fiji, like other Pacific islands, has a strong oral tradition, although it has degraded over the last 150 years as a result of European immigration in the second half of the 19th century; presently, it is primarily recalled in fragmented form by the elderly (Janif et al., 2016). The loss of traditional environmental, social, economic, political, and spiritual knowledge systems due to the modernization of indigenous communities may cause local resilience to erode (Campbell, 2009).

Community cohesion suffers as a result of the loss of tradition. Tightly knit tiny communities can and have helped each other in the aftermath of disasters, for example, by intensifying fishing (Takasaki, 2015), and are ready to help those who have been harmed. Food sharing among family, friends, and visitors is a critical component of Melanesian culture (Singh-Peterson & Iranacolaivalu, 2018), and social bonding can be a crucial source of strength. Communities have been observed seeking safety from nearby villages rather than waiting for government assistance, and cyclone preparations may include concerns for the needs of others (Singh-Peterson & Iranacolaivalu, 2018). Traditional practices should be treasured, and the institutions that enable the processes should be safeguarded to support community resilience.

2.4 The physical vulnerability of natural disaster and climate change in Fiji

To begin with, 90% of the population lives in coastal areas, which are vulnerable to flooding, cyclones, and sea-level rise, and housing is frequently not climate-resilient or built with climate risks in mind (Government of Fiji, 2018). Agriculture is also particularly vulnerable because many farms have moved into locations prone to floods or have a high risk of landslides, increasing the danger of livelihood loss. Furthermore, some essential infrastructure is particularly vulnerable to weather-related catastrophes.

In 1990, the Fijian Government created the National Building Code of Fiji to increase building safety. However, it has remained unchanged since then, and according to estimates, structures built to this code may withstand cyclones up to category 4, but any events above this may jeopardize the structural integrity (Aquino et al., 2018). In addition, builders in the villages have minimal formal engineering or carpentry education, and the trade is passed down through generations, resulting in a shortage of trained engineers to supervise construction projects (Aquino et al., 2018).

In and around some luxury tourist destinations, unsustainable growth has been discovered to have an environmental impact and increase flood danger. One of these is Denarau Island, where five-star hotels have sprung up during the previous few decades. During the construction phase, natural

mangrove forests that served as buffer zones were eliminated, affecting local livelihoods as fish disappeared from the area (Bernard & Cook, 2015). The lack of buffer zones has permanently harmed local communities and is currently repelling tourism owing to the areas that gets frequently flooded, resulting in a claimed loss of millions of dollars (Bernard & Cook, 2015).

2.5 Social impact of natural disasters and climate change in Fiji

In 2016, Cyclone Winston hit 62 percent of the country's population, killing 44 people and destroying 30,369 homes, 495 schools, and 88 health facilities (Government of Fiji, 2016). In the initial phases of response and recovery, remoteness became an acute challenge; the central government help could not always reach smaller towns distant from urban areas (Miyaji et al., 2017). In addition, due to a lack of capacity to process and distribute goods from overseas, the distribution of supplies across the country was complex, affecting the impact measurement and needs assessment (Kitabatake, 2017).

Loss of livelihood due to disasters is a severe problem in Fiji. Nearly half of the impacted farming households with livelihoods related to sugar farming were predicted to slip into poverty due to the 2009 flooding, and 40% were estimated to be unable to satisfy basic nutritional needs (Lal, 2011). Farmers were also likely to have pre-flood debts, minimal savings, and income already suffering due to global sugar market circumstances (Lal, 2011). In addition, a considerable number of households in rural areas and distant parts of the country rely on the marine and terrestrial biological systems as their primary source of food (Martin et al., 2018). As a result, disasters that impair food sources may have a negative influence on community food security.

Children have also been proven to be affected by disasters, and not just because their education has been disrupted. For example, in the aftermath of the 2012 floods, families were compelled to keep their children at home to care for other children or earn money in different ways (UNWomen, 2014). Furthermore, catastrophes have been linked to an increase in the frequency of gender-based and sexual violence (UNWomen, 2014). Women were also reportedly threatened with violence at evacuation stations in the aftermath of Cyclone Winston (Sivertsen, 2016).

2.6 The economic impact of natural disaster and climate change in Fiji

Annual economic damages due to disasters were projected to be FJ\$ 35 million, or approximately US\$ 16.3 million, between 1980 and 2016 (Government of Fiji, 2016). The most severe impacts are caused by cyclones, torrential rain, and flooding, which significantly influence agriculture and tourism, the latter of which frequently suffers losses due to cancellations and destroyed assets. There are, however, only a few extensive studies that estimate the cost of disasters by industry. According to Jayaraman et al. (2018), the most recent one was undertaken by Benson (1997). Despite tourism

being a significant source of income in Fiji, the main finding from both studies, which span a decade, is that there is still a lack of awareness about the relationship between disasters and tourism.

Category 5 Tropical Cyclone Winston hit the Southern Hemisphere in 2016, with average wind speeds of 233 km/h, making it one of the most intense cyclones ever recorded (Government of Fiji, 2016). The total worth of lost assets reached US\$ 1.3 billion, with roughly half of that coming from post-disaster damages as the country's economy battled to recover. Even in the instance of fisheries, due to fish habitat losses, the agricultural sector was estimated to have incurred 65 percent of all losses due to output losses (Government of Fiji, 2016). Disaster losses and damages per capita ranged from FJ\$ 8,500 to over FJ\$ 10,000 in Ra, Bua, and Lomaiviti, which is a large share of the typical yearly household income (Government of Fiji, 2016). Impact on critical sectors such as housing, transportation, manufacturing, agriculture, and electricity reduced the overall predicted damage to future growth by 2.5 percent. Damage and losses as a percentage of GDP were projected to be 20%. (ADB, 2019).

Floods are one of the most common causes of economic devastation in Fiji, even when cyclones aren't present. For example, floods in 2004 caused a minimum of FJ\$ 13 million in damages in Navua, including housing, business, and other losses, without accounting for potential loss of value (Holland et al., 2011). In 2009, heavy rains caused the worst flooding since 1931, with water levels reaching 3 to 5 meters in certain areas, inflicting crop losses and injuring around 15% of sugarcane farms, as well as damaging four mill sites at the cost of US\$13.4 million (Lal, 2011).

In addition, flooding in the Ba and Penang River catchments caused an estimated FJ\$ 81.1 million in economic damages in 2012. (Brown et al., 2014). Furthermore, the agriculture industry is subject to weather-related losses due to rain-fed farming practices and flooding and farms extending on steep hills prone to landslides (Lal, 2011). Given that tourism has been identified as a key future driver of Fiji's economic growth and that the country's sugar industry is in decline due to declining global demand (Bernard & Cook, 2015), understanding the effects of flooding and disasters on the sector is critical.

3.6 Proposed Solution.

The following section highlights some of the proposed priorities of Fiji's disaster risk reduction (DRR) and climate change adaptation (CCA) processes, which can be mandated and guided by global policy frameworks such as the Sendai Framework for Disaster Risk Reduction (SFDRR), Sustainable Development Goals (SDGs), and the Paris Climate Agreement.

3.5 Understanding and mainstreaming disaster risk reduction – understanding and mainstreaming disaster management into the development planning process essentially means looking critically at each activity that is being planned, not only from the perspective of reducing the disaster vulnerability of that activity but also from the perspective of minimizing that activity's potential contribution to hazard-specific vulnerability. Thus, mainstreaming disaster management into the development process and management should consider structural, non-structural, and disaster mitigation projects and improving legislation, institutional arrangement and have comprehensive DRM plans. In addition, to increase the understanding of DRR and its management principles, the government should emphasize introducing DRM modules into the school curriculum and engage and sensitize communities in risk assessment and analysis and application for decision making.

3.2 Strengthening Disaster Risk Governance to Manage Disaster Risk – the government of the day should establish a dedicated structure for coordination of disaster risk reduction, set up mechanisms for exchange of DRR/M best practices, lessons learned, and experiences from developed and developing countries, formulate, improve and sustain policies, strategies, plans, and legal frameworks for DRR and integrate into sustainable development strategies and decentralize powers and resources to catalyze actions at the local level. In addition, the government should bridge the gap between formal and informal, national and local systems concerning DRR plans and projects.

3.3 Investing and strengthening finance in Disaster Risk Reduction for Resilience - establish a continental trust fund for efficient management of disaster risk management and ensure linkage with existing disaster management funds, establish functional risk transfer and financial and social protection mechanisms, establish and allocate resources for disaster risk reduction investment plans and implement micro-insurance and social safety net programs and identifying possible assistance and engaging with other stakeholders for DRR budgeting and establish a sustainable financing base with donors and funding agencies. In addition, the government should also draw on an array of instruments to support enhanced financial preparedness.

3.4 Enhancing disaster preparedness for effective response to “Build Back Better” in recovery, rehabilitation, and reconstruction – establish and effectively coordinate preparedness and integrate preparedness measures for effective response, establish and strengthen multi-hazard early warning systems for early action and response,

establish and strengthen emergency coordination centers and establish and strengthen multi-disciplinary disaster risk management mechanisms. In addition, the DRR unit should have a systematic tracking of quality and reach of initiatives and progress against targets, using robust and broad effectiveness measures.

3.5 knowledge and information – to improve knowledge (traditional wisdom, customs, and tacit), information (DRR education/ organize and hold regional/national level meetings, seminars, conferences, round table discussions, and study tours to present findings of pilot demonstrations at city level), attitudes (organize lessons learned workshops to share experience and thereby convince authorities of its importance), and practices (traditional techniques/ publish good practices examples relating to DRR) among people on how to respond to and reduce disaster risk. In addition, the government of Fiji should conduct regular meetings on CCA/DRR, improve CCA/DRR broadcast programs and campaigns. Furthermore, the government should generate and disseminate risk knowledge and information for decision-making in all sectors. Finally, raising awareness among government officials and the public is required to secure a solid appreciation and understanding of the linkages between DRR and sustainable development.

3.6 Policy monitoring and review – monitoring and measuring progress against performance indicators are essential for gauging the success of the DRR programs, plans, and projects, and also it should include frontline feedback to indicate the success rate of policies. In addition, the policy monitoring and review need to have leadership and direction and a framework for adaptation and DRR policies in the long term that will guarantee long-term success; therefore, coordinated leadership should be implemented across all levels.

4.5 Assessment & Conclusion.

Implementing disaster risk reduction and climate risk policies or programs is slow due to fragmented coordination systems and financial allocations (Ministry of Finance, 2015). In addition, most countries, including Fiji, lack the financial and personnel resources to create and maintain adaptation and DRR projects, particularly in distant areas in the periphery. Thus, insufficient financial and human capability further impeding growth (Janif et al., 2016). Fiji's government has recognized barriers to undertaking climate adaptation and DRR initiatives. Lack of capacity, information, expertise, and technology has been identified as the most pressing issues to address to improve access to SADD data, identify vulnerable groups' awareness of climate change consequences, and enhance

stakeholders' access to information (Government of Fiji, 2018) Institutional impediments at the national level, such as incorporating climate risks and DRR into development planning, are insufficient, and local governments and subnational development are not yet enabled in undertaking tasks to improve local adaptation (Government of Fiji, 2018). Finally, to lower the number of highly exposed and vulnerable people, adaptation expenditures might be increased, and poverty reduction should be at the forefront of adaptation planning.

The government of Fiji should increase stakeholder involvement to enhance and improve disaster finance and implement different initiatives in terms of tax holidays for undertaking renewable energy projects and allow more tax deductions for voluntary gifts to the disaster relief fund. The government should also build a more outstanding communication channel between institutions and tackle conflict-related to CCA and DRR issues. Furthermore, the government of the day needs to have even more decisive political leadership to overcome cognitive barriers in long-term planning and investment and to encourage greater coordination between institutions and stakeholders. It also requires an integrated, forward-looking analysis of activities and active communication between all stakeholders and leveraging international organizations and experts to help build their limited capacity.

5.5 Reference

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