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**Tourism Investment Choices and Flood Risk: illustrative case study on
Denarau Island Resort in Fiji**

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How do investment decisions in the private sector (in a context of incentives and regulation by the public sector) increase levels of disaster risk and, in some cases, transfer risk from private investors to governments and to other sectors of society?

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Abstract

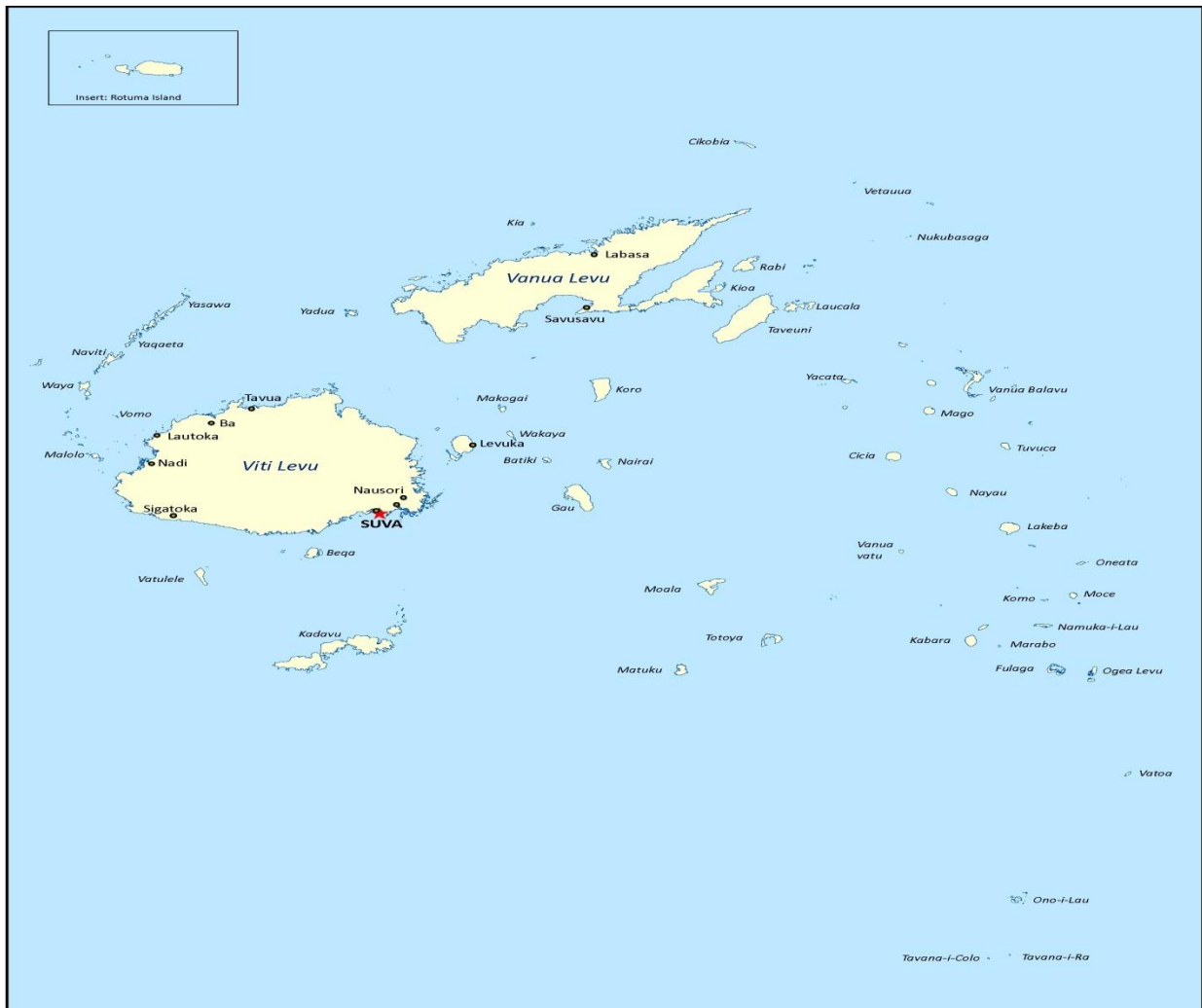
One of the factors which increases the vulnerability of SIDS is their limited economic diversification. Many SIDS countries rely heavily on the tourism industry as a key source of national income and employment, as they have a comparative advantage in this sector due to luxurious sandy beaches and picturesque coastlines. However, this reliance on tourism creates pressure to offer investors concessions and incentives to undertake construction projects which may exacerbate the risk exposure of the local population.

One case in which this dynamic can be seen is the development of the Denarau island tourist area in Fiji. With a typical SIDS economic structure, Fiji has identified tourism a priority industry for expansion, and it constitutes 5 percent of GDP. As part of the expansion drive in this sector to generate additional foreign exchange and other economic benefits, Denarau was designed and built as a tourist enclave located on the western coast of Fiji's main island, strategically located near the country's international airport. Fiji is one of the larger Pacific countries, and it has a full range of tourist options, ranging from cheap and basic backpackers' accommodation, specialty diving and sports tourism, mid-range and up to high end hotel luxury hotels. From the outset Denarau was conceived to target the high end niche in the tourism sector.

Introduction

Fiji is composed of 332 islands which cover a land area of 18,273 km². Roughly one third (110) of the islands are populated by approximately 883,125 inhabitants. The majority of the population lives on the two main islands of Viti Levu and Vanua Levu (see Figure 1). Fiji is located in both the tropical cyclone belt, consequently experiencing on average one cyclone per year, and the Pacific "ring of fire" and is therefore exposed to geo-physical in addition to hydro-meteorological hazards. Hydro-meteorological hazards include tropical cyclones, floods and droughts, whereas geo-physical hazards include earthquakes, tsunamis and landslides. Climate change is likely to increase the frequency of hydro-meteorological events.

Figure 1. Map of the Fiji Islands



Source: SOPAC Division, Secretariat of the Pacific Community

Fiji is one of the largest economies among the Pacific Island Countries and Territories with GDP per capita in 2010 estimated to approximately 2,500 USD per person. In 2009, almost 53 per cent of the population were living in urban areas (ADB, 2010) which suggests the presence of urban drift as people relocate to the urban areas in pursuit of higher wages. There are 329,755 people classified as economically active in Fiji with 182,043 earning wages/salaries. Those earning wages/salaries in the rural areas are likely to be earning the minimum wage, which increases the attractiveness of moving in to the urban areas. Table 1 demonstrates the difference between potential earnings in the urban and rural area, showing that the average urban wage is approximately 50 per cent higher than the average rural wage.

Table 1. Average Household income in 2008 (FJD)

	Average Household income (FJD)	Average Household income (USD)
Rural	11,608	5,700
Urban	23,036	11,500
Average	17,394	8,600

Source: 2008-9 Household Income and expenditure survey

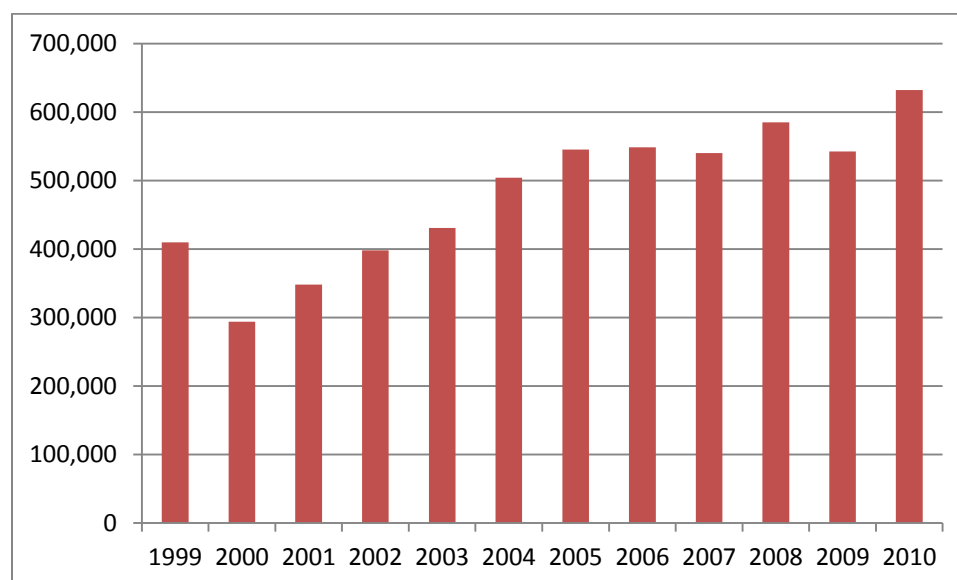
In Fiji, it is not uncommon that hotel workers are the main income earners for the family unit and travel in to the resort from the rural areas, as would be the case for Denarau. These travel costs result in a lower wage for the earner and a lower household income, which has implications for the poverty level in the surrounding areas.

Over the past ten years growth in real Growth Domestic Product (GDP) has been approximately 2 per cent per annum. GDP in Fiji is estimated to be worth approximately USD2.1 billion in 2010 some 36 per cent larger than in 2000. Despite several coups and political upheaval, the economy of Fiji continues to remain one of the largest economies in the region. The economy is largely driven by the manufacturing and transport sectors, which account for approximately 14 per cent of GDP each. The sugar industry makes a large contribution to these sectors, however the sugar industry has been in decline globally and nationally in recent years. Fiji has consequently identified tourism a priority industry for expansion, and currently accounts for 5 percent of GDP.

Tourism in Fiji

Tourism arrivals have increased by 115 percent between 1999 and 2010, reaching 631,838 in 2010 (Fiji Islands Bureau of Statistics - FIBOS) - a number almost equal to the entire population of Fiji, at 883,125. There was, however, a marked decline in 2000 following the *coup d'état* and also in 2009 following the Nadi and Ba floods.

Figure 2. Visitor Arrivals 1999-2010



Source: Fiji Islands Bureau of Statistics (FIBOS)

Fiji attracts tourists from all over the world, each year on average with 75 per cent of visitor arrivals are tourists equating to some 472,634 tourists who spend, on average, 9.2 days in country. The majority of visitors come from Australia (46%), followed by New Zealand (17%), accounting for 63 per cent of visitors. A further 10 percent come from the US and another 10 percent from Europe, the remainder originating from Asia and the rest of the world. In addition to those tourists coming on vacation, Fiji receives regular visits from cruise ships in to Suva, Lautoka and Denarau. This sees an additional 60,301 people arrive in the Fiji islands for a day trip (FIBOS). Today, 50% of the tourist arrivals in Fiji go to Denarau, many of them traveling out to the Yasawas island chain via the marina.

History of Denarau

The name "Denarau" is a shortened version of the Fijian phrase *dede na raurau*, which in the Nadi dialect of Fijian language translates loosely as "rubbish piling up." Before it was developed into a tourist enclave, much of the land area in what is now Denarau was comprised of mangroves, swamps, low-lying small islands and mud flats. When floods occurred, currents routinely transported a concentration of debris and rubbish into this area, leading to the use of this phrase to refer to that spot.

The Denarau concept was elaborated in a Master Plan outlined by an American developer in 1969. The first luxury hotel was built in 1975 (the Regent, which is now the Westin), followed by the Sheraton in 1987, and in the 1990s, a cascade of five-star accommodations including Hilton, Radisson, and Sofitel. The most accelerated development push in Denarau occurred from 1988-1993, when Japanese property developer EIE International Corporation entered the scene and undertook "major development works on the island of a scale never before seen in Fiji. This included the clearing of the balance of the 600 acres of land, the reclamation of a vast area of swamp... and \$100 million (USD) spent on infrastructure." (Tabua Investments, 2012). As *de rigueur* with such exclusive areas, the island resort includes a world class golf course, shopping malls, tennis courts and a bustling marina teeming with cruise ships and yachts.

To promote the rapid expansion of this upscale tourist enclave, major international hotel chains were offered an attractive package of incentives, including tax-free status for 20 years. The rental cost of the land lease was lowered after negotiations with the *Tui Nadi* (chief of Nadi), taking into account the economic benefits foreseen for the local population of the anticipated tourism boom.

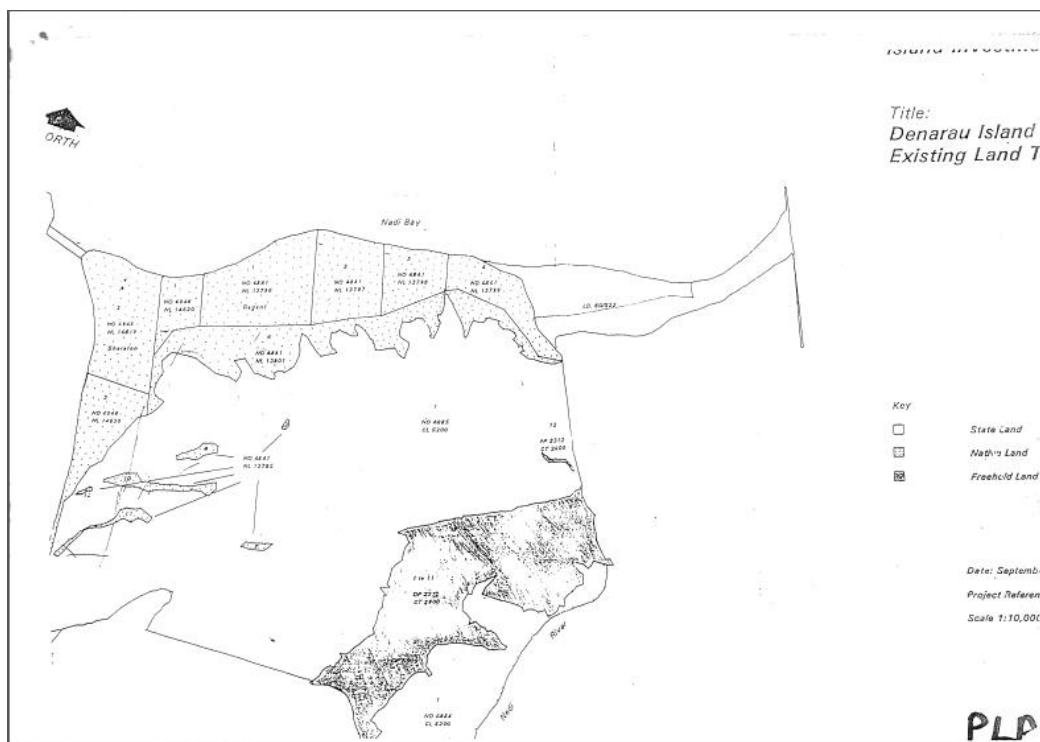
Under Fiji's investment and tax laws, as in many SIDS one of the main sectors prioritized for incentives and concessions is "tourism-related investment" (Embassy 2012), along with agriculture, mining, film-making and three other sectors. To promote significant tourism investment, in 1996 Fiji introduced a Short Life Investment Package (SLIP) for investments of over \$40 million FJD, and later the HALF SLIP for investments of \$7 million FJD or more (FIRCA 2012). Clearly this considerable level of investment is accessible only to multinational companies and hotel chains. Under the SLIP, exemptions and incentives are generous, consisting of: 20-year tax holiday on the investment, duty free status on capital equipment and the importation of construction materials, as well as exemption from sales tax (VAT). For the Half SLIP these same exemptions apply for 10 years.

FIRCA explains that each application for SLIP or Half SLIP status must be approved by the Minister of Finance, again showing the strategic importance that Fiji assigns to major tourism investments, under

the country's overall development strategy (Mow 2012). The Minister has rarely been known to deny these submissions.

The Denarau project spans 680 acres and entailed significant construction on a foundation of reclaimed land, taking space previously occupied by the ocean and filling this in to form a land mass through trucking in soil from the upper Nadi River basin and pouring concrete. From the nearby village of Ratabu, 2.5 million cubic meters of soil were brought in, demolishing an entire hill from that area. The coastline in this part of the country featured an abundance of mangroves, which act as a very effective natural buffer against incoming waves and provide protection against erosion, storm surge and even tsunamis. Many of those mangroves were old growth trees of more than 100 years, with extensive and sturdy roots. For the construction of Denarau, much of this mangrove area was removed, as these plants interfered with tourists' access to the sea and did not mesh with the new vision of a highly manicured landscape.

Figure 3. Denarau area before the tourism development



Source: Special Administrator of Nadi town.

Figure 4. Denarau area today, after tourism development



Source: www.lastminute.com/accomodation.fiji

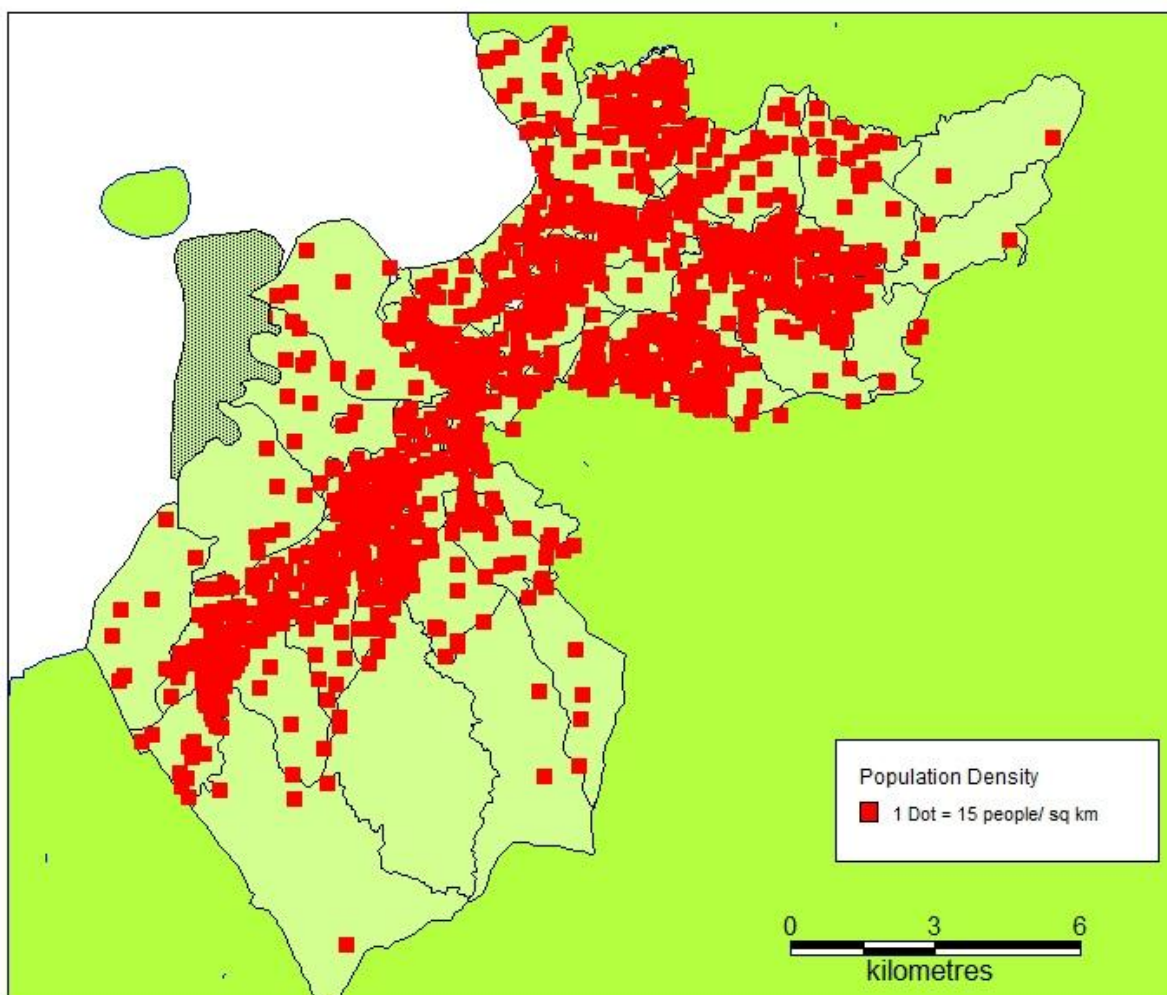
The land where Denarau stands originally belonged to the nearby Narewa village, comprised of three tribes. In order to facilitate the tourism investment, in 1996 Denarau was the site of the first land tenure reorganization or “land swap” ever in Fiji (Tamani Tuidraki, 2012), which had to be approved at the cabinet level. Under Fiji’s land tenure system, the majority of land at 84% is native or customary (owned by tribes), 8% is government land, and the remaining 8% is freehold land which could be bought and sold. (Dept. of Lands and Surveys, 2012). The “land swap” in this case traded 100 acres of customary land for 100 acres of government land, to optimize profitability for local and international investors. The official history of Denarau notes that “the reorganization allowed for all the resorts to be native lease, the residential properties on freehold land, and the golf course and remainder of the land for commercial development to be state land.” (Tabua Investments, 2010)

The Denarau brand logo features two herons, one sitting and the other poised for flight – to symbolize relaxation and activity. This reference is more historical than contemporary; with the elimination of large expanses of mangroves, herons are no longer seen in this area.

The course of the Nadi River was altered by this project, and with the influx of tourist businesses, the quantity of waste going in to the river increased noticeably. One extensive area of tidal flats was dredged to build the harbour for the marina, and the 900,000 cubic meters of materials dredged then transferred as landfill of the lot where the Hilton was then built (Tamani Tudidraki, 2012).

Since Denarau was built, many business people and others looking for jobs moved into the Nadi area, seeking to supply the goods and services sought by the massive influx of tourists into Denarau. Figure 5 shows Denarau and the other enumeration areas of Nadi in terms of population density ranging from 7 to 710 people per square kilometre. It can be seen that many of the areas which sit adjacent to the central business district in Nadi have some of the highest population densities in the Nadi area. Many of these people, in particular the small business owners and their local employees, have now sustained the biggest losses in the recent severe floods.

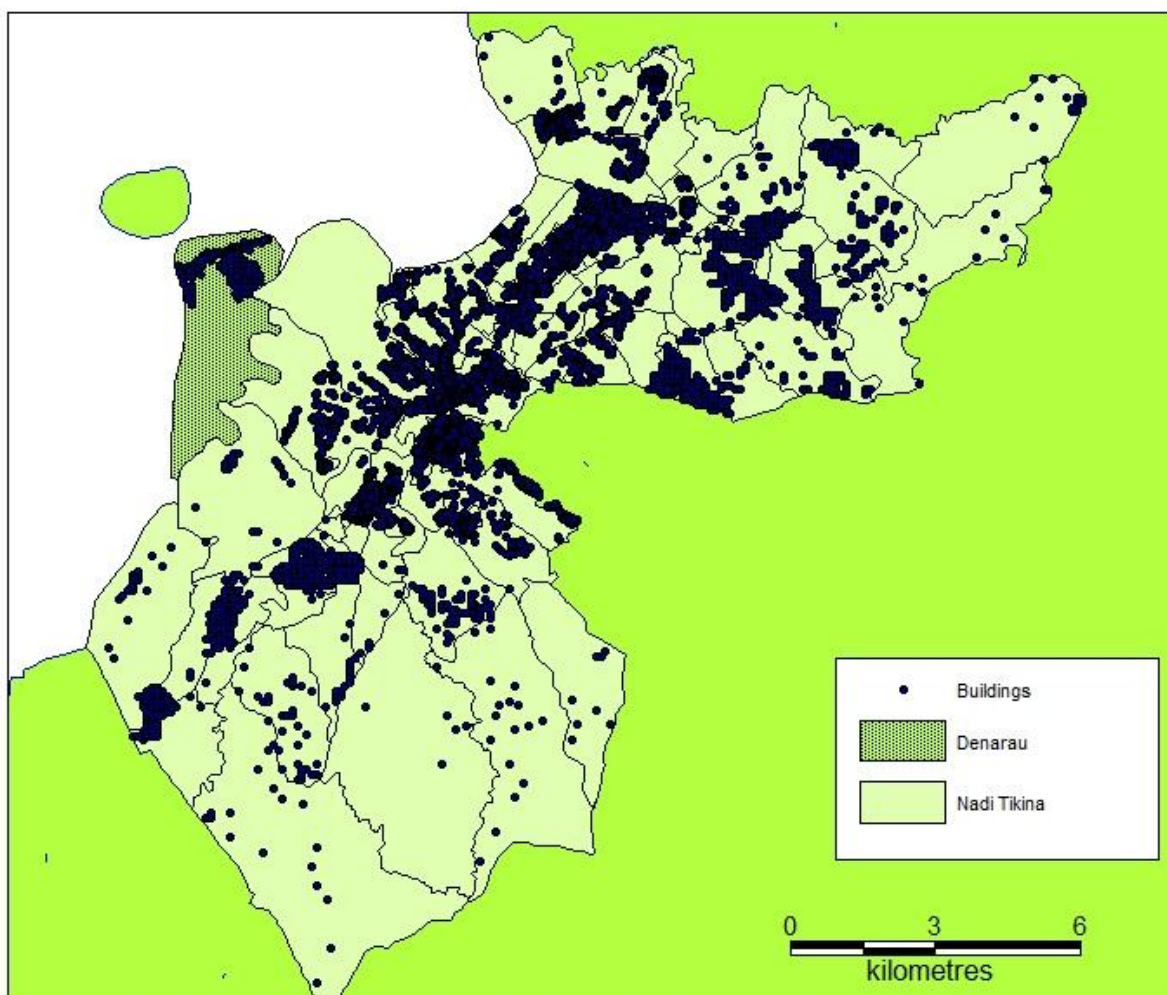
Figure 5. Population Density in Nadi by Enumeration Area in km²



Source: Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)

The potential number of buildings exposed is depicted in Figure 6, which shows the location of the buildings in the Nadi that were surveyed as part of the Pacific Catastrophe Risk and Financing Initiative (PCRAFI). This initiative collected more than 400,000 building footprints for structural classifications were digitized from high-resolution satellite images across the Pacific region. In the Nadi area approximately 9,500 buildings were digitized, of these buildings 80% were residential, 13% commercial and industrial and the remaining 7 percent were classified as public and other buildings. The estimated replacement of all of these buildings is \$2.3 billion USD (PCRAFI), which demonstrates the level of financial exposure.

Figure 6. Number of Buildings in the Nadi by Enumeration Area



Source: Pacific Catastrophe Risk Assessment and Financing Initiative

The socio-economic assessment prepared by SOPAC showed that the overall impact on small businesses by major flooding in 2009 totaled 143 million USD, with a further 7 million USD in losses to households. Two months after the March 2012 floods, the Nadi Chamber of Commerce reported that 46 small businesses (of a total of 250 registered businesses) had closed down due to damages to their premises and destruction of stock, and had consequently laid off more than 100 staff (Nasiko (a), 2012). Only a handful of these were expected to eventually re-open. The businesses which closed down were among the smallest retailers in the town, and included clothing shops, pizza restaurants, sports supply stores, bargain stores and small grocery shops. Most staff employed at these enterprises were earning minimum wage, therefore are in the lowest income brackets. A few had relocated to other towns, given the discouraging certainty of recurring floods in Nadi. The Chamber of Commerce estimates that businesses in Nadi town sustained approximately \$40 million in losses to their commercial operations, leaving aside personal and residential damages (Nasiko (b), 2012). A survey revealed that only half of these businesses had full insurance cover, while most of them had partially ensured their properties. (Nasiko (b), 2012). Only the largest and international businesses were able to quickly restore operations after the floods; for example, ANZ bank subsequently invested in floodproofing their new premises, by

relocating to higher ground, ensuring that wiring was in the ceilings rather than the floor, and installing waterproof materials for all surfaces.

For both the greater expansion of luxury tourism and as a flood mitigation measure, proposals for dredging of the Nadi river and area have recently been put forward. Following the extensive re-engineering of the Denarau site and the surrounding Nadi vicinity, silt is building up and is perceived by some to be hampering further tourist development and exacerbating the recurring floods. Port Denarau Martina Ltd has applied for a dredging license, arguing that “the channel is in desperate need of about \$25,000 worth of maintenance dredging to allow super-yachts to transit in and out.” (Whippy, 2012).

In the meantime, one of the key actions under the Fiji governments flood mitigation programme is a three-phase dredging of Nadi River, as the sedimentation in this river bed is considered to be a key aggravating factor. The Director for Land and Water Resources Management Division of the Ministry of Primary Industry notes that the objective of this dredging is to protect the population from the incidence of floods and their damaging impacts (Ministry of Information, 2010). In the last three years, the government has spent \$5 million USD dredging the Nadi River, from the mouth of the river up to 9 kilometers inland, removing 1.2 million cubic metres of soil (Malo, 2010). Similar dredging programs are planned for other flood-prone areas of Fiji, such as Labasa and Wailevu Rivers and the Rewa Delta.

However, assessment of the effectiveness of this dredging for flood control are mixed. The LWRD Director states that the dredging substantially increases the capacity of river systems to discharge flood waters, so that waters which normally drain in 24 hours will now clear in 15 hours (Buimaiono, 2012). On the other side, Professor Patrick Nunn of University of the South Pacific asserts that the “the hole made by three years of dredging in river channels like these can be filled up in three hours of flood.” (Buimaiono, 2012)

Cost of Past Floods

In 2012 alone Fiji has experienced severe flooding in the areas of Ra, Tavua, Ba, Lautoka, Nadi, Nadroga, Sigatoka, and Rewa in January 2012. In March 2012 these same areas were affected again but with greater intensity. These events caused five fatalities and affected around 14,000 people, with approximately 12,000 people staying evacuation centres at some point during the floods. In a SIDS country with only 883,125 population, these impacts are staggering. One local 72-year-old resident noted that never before in her lifetime had she seen flood waters reach that high inside her house, as during the March 2012 floods. The latest estimates for damage costs from the Government of Fiji for the 2012 floods stand at approximately 35.5 million USD. All of the costs which have been calculated by government will be borne by the government, which will result in a reallocation of the national budget and delays to previously planned development projects until the next fiscal year or later. This poses problems for the Government of Fiji as the repair of national infrastructure required following floods and other hazardous events drains limited national financial resources.

The Nadi-Ba catchment area, inside which Denarau is located, has always been notoriously flood-prone, but in the last 5 years the incidence of severe floods has increased remarkably. This may be considered partially an effect of climate change, but the Denarau development can also be considered a key aggravating factor increasing flood exposure. Flooding at a level considered a 1-in-50 year event (Hay,

2009) occurred in this zone in 2009 and again in 2012. In 2009 an assessment conducted by the Prime Minister's Office estimated damages due to the 2009 floods at \$60 million USD, amounting to 3 percent of GDP. A total of 11,458 people were displaced and 146,725 affected (17 percent of the population) in significant ways, mainly sugar cane farmers, other farmers, small business owners and self-employed market vendors (Government of Fiji, 2009). In addition to the Government estimates a study on the economic impact to communities and small businesses conducted by the Pacific Islands Applied Geoscience Commission [SOPAC] (in collaboration with the UNDP Pacific Centre, Fiji Red Cross and Ministry of Provincial Development) in two sample areas in Nadi and Ba revealed losses to the local communities and small business at more than \$150 million USD (Ambroz, A. 2009 and Holland, P. 2009). Those affected were men and women who generally struggle to stay over the poverty line, and sustained significant loss of income and assets due to these floods.

Figure 7. Local Nadi residents trapped in flood waters



In Denarau while some of the costs to some businesses, predominantly retail outlets, were captured in the assessment by Holland 2009, the data for the hotel operators was removed as the losses to the five star hotel industry would have been disproportionate to the other businesses operating within the Nadi-Ba catchment areas. The losses attributable to the Denarau island were relatively small reaching approximately 332,500 USD. The hotel operators in Denarau will have undoubtedly experienced some losses due to the cancellation of bookings, once tourists hear of the floods. In 2009, one hotel reported a loss of \$1.5 million USD as the result of a cancellation of two international conferences (Holland 2009).

In addition to this the hotels would have to pay staff overtime to facilitate the clean-up operations and discounted room rates to boost occupancy.

However, even during the severe flooding recently occurring in Nadi, or during heavy cyclones, the Denarau enclave never floods. Due to the exquisite planning and engineering with which it was built, with land elevated by 2 metres and highly efficient drainage channels, it suffers only minimal damage created by high tides causing salt water inundation. However, the central business district was submerged in up to 4 metres of water during these floods, effectively blocking tourists' access to the airport and blocking delivery of supplies to the hotels. Following the March 2012 floods, some tourists were transported to the airport by helicopter at a cost of \$300 USD each, while in some locations others were delivered by boat to the airport.

The irony of the current situation in ever more flood prone Nadi is that the tourists that Denarau was built to attract are now being driven away by the floods. In March 2012, the Fiji Times newspaper reported "the March floods forced the closure of the Nadi International Airport after the runway went under three feet of water and was inundated with debris." (Chaudhary, 2012) Flights were cancelled during this period of about two days, resulting in losses for airlines and in particular the national carrier Air Pacific, which dominates the Fiji tourism traffic. Airport Fiji's Limited's Risk and Safety Manager, Molly Murphy, reported "airlines were asked to fly in empty and ferry tourist back to their homes" (Chaudhary, 2012).

Since 2009, the Government estimates of damage caused by the flooding total \$95.5 million USD. If we include the figures from the Holland and Ambrose 2009 studies, this figure increases to \$245.5 million USD, which is worth approximately 12 percent of GDP in 2010. The real cost of the floods is unknown however, as economic losses such as foregone wages and taxes were not calculated. A study by Cook in 2010 attempts to quantify such losses; if 5 percent of those employed and earning the average wage lost their jobs as a result of the flood this would equate to approximately \$86.8 million USD, equivalent to 4 percent of GDP. This would indicate that the total costs generated by flooding in the past four years amounts to approximately \$332 million USD or 16 percent of GDP.

Policy recommendations

In light of the troubling certainty that floods will continue to recur and worsen in the Nadi area of Fiji, the country's second largest population centre, it is pertinent to briefly consider a few medium-term policy options.

- *Information on damage and loss.* Better quality information is needed, on losses in particular. The damage estimates currently available in Fiji as to flood impacts are often inconsistent. This data should be sex-disaggregated so that trends on impacts for men and women can be identified and can then inform policy choices. In Fiji this data should also be disaggregated for the predominant ethnic groups - iTaukei and Indo-Fijians – to detect any differences.
- *Flood early warning systems.* Flood EWS have been installed over the last few years in Ba and Navua, and to be installed shortly in the Nadi and Rewa river deltas. To date these systems have not proved reliably effective in practice, with the shortcomings variously attributed to lack of proper maintenance, shortage of spare parts, insufficient involvement of local community, lack of hydrologists in the country and technical issues related to cell phone system linkages for

transmission of warnings. A concerted effort should be made to ascertain the deficiencies in each case and it should be a government priority to fix these.

- *Dredging of rivers.* Technical assessment of the effectiveness of the river dredging in Fiji as a flood protection measure remains inconclusive. However, at the same time the multi-million dollar cost of this investment, and its recurring nature, appear to make it unsustainable over the medium term.
- *Insurance/micro-insurance.* The data shows that those who suffer the most debilitating economic losses from floods in Fiji are small business owners, farmers and other low-income wage earners. Serious consideration should be given to the development and prompt implementation of insurance and micro-insurance schemes which would bolster their resilience to these shocks.
- *Land use planning.* There are challenges to implementing and enforcing land use planning in Fiji, given the large percentage of customary land, over which local chiefs have jurisdiction. However, if these challenges can be addressed, better enforcement and monitoring of land use regulation could significantly reduce the exposure of vulnerable and low income people to the devastating losses sustained by floods. One example in the region may be relevant is the land coding system that Christchurch, New Zealand, has adopted in the wake of a series of destructive earthquakes. For its rebuilding programme, the land in Christchurch is now classified into red, yellow and green zones, with the red zone off limits for construction given its proven high risk exposure. A similar system could be developed to delimit land prone to recurring floods in Fiji, and therefore unsuitable for housing or commerce.
- *Government-sponsored relocation plan.* Following the recent severe floods of 2012, a debate is emerging on the viability of relocation of part of the Nadi residential and commercial areas, and in fact a few of the larger businesses had already started operationalizing relocation to higher ground. While there is much resistance by government to this option, given the perception of the enormous costs entailed, if a proper cost-benefit analysis is undertaken it may well reveal that the investment required for a government-sponsored relocation programme may be outweighed by the costs of repeated flood response and recovery programmes. A planned relocation programme would not necessarily require government to bear the entirety of costs, but in a more modest approach could include incentives, low cost loans or other measures to facilitate local residents' relocation of houses and businesses to higher and safer ground.
- *Reliance on tourism.* The floods so far are starting to cause interruptions in Fiji's tourism industry, which is of course also sensitive to course other hazards such as cyclones and tsunamis, as well as political upheavals such as *coup d'états*, which have marked Fiji's recent history. Also in view of the still-unfolding global financial crisis, the sustainability of tourism as an industry is precarious. While as a struggling SIDS country Fiji may have limited economic options, the reliance on tourism as compared to other sectors should be better balanced.

Conclusion

SIDS countries often face difficult choices on which paths to pursue towards development and the dream of prosperity. While tourism often seems a logical and profitable choice, under which SIDS can capitalize on their natural attractions, investment in this sector must be chosen and assessed carefully. In the tourism sector as in others, there are a range of options on different scales, and business models which have implications related to environmental and disaster risks. It is imperative that national governments attempt to anticipate and weigh the long term implications of these different options in regard to disaster risks – to determine whether they may be neutral or increase the risks of disaster impacts.

Some of the dynamics noted in the Denarau case study include repatriation of a significant portion of the profits, and urban drift to more vulnerable sites (Nadi river basin) as people seek to seize the opportunities expected with the tourism expansion. It should be noted that tourism is a luxury item and when there is an economic downturn, as was the case in following the global financial crisis, people either travel less or stay closer to home. Similarly, investors choose to reduce their net foreign assets in preference for domestic assets. These dynamics in fact increase vulnerability, which is ultimately transferred to the small business owners, hotel employees and local residents on the fringes of the land which has undergone major re-engineering to accommodate international hotel chains.

All parties concur that the flooding in Nadi is expected to worsen, and some observers anticipate that Nadi town and the adjacent townships will be under water by 2030, based on extrapolation of the current trends (Biumaiono, 2012). Under that extreme but lamentably likely scenario, international investors will be quick to cut their losses and close down operations in favor the next island with pristine sandy beaches. The Fijian population, especially those with the fewer resources, will then be left to fend for themselves in the face of rising waters.

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