WASH and Tourism in the Mamanuca Islands, Fiji: Case Study Report

Research Project: Engaging Corporate Actors for Inclusive WASH-at-Work

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International WaterCentre

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List of Abbreviations

CIR	Castaway Island Resort
CSA	Case Study Area
CSR	Corporate Social Responsibility
F&B	Food and beverage
FHTA	Fiji Hotel and Tourism Association
GDP	Gross Domestic Product
GEDSI	Gender equality, disability and social inclusion
HLPW	United Nation's High Level Panel on Water
HWWS	Handwashing with soap
LIR	Lomani Island Resort
MES	Mamanuca Environmental Society
MHM	Menstrual Hygiene Management
MIR	Malolo Island Resort
MSME	Micro and Small to Medium Enterprise
NCD	Non-communicable diseases
MoE	Ministry of Education
MoWE	Ministry of Waterways and Environment
NZ	New Zealand
PIR	Plantation Island Resort
SDG	Sustainable Development Goal
STP	Septic Tank Plant
SVGs	Socially Vulnerable Groups
UNICEF	United Nations International Children's Emergency Fund
VFR	Visiting Friends and Relatives
WASH	Water, Sanitation and Hygiene
WAF	Water Authority Fiji

Executive Summary

Tourism is Fiji's main revenue earner, contributing an estimated 38 per cent of the country's gross domestic product (GDP) (IFC, 2020). The sector supports over 118,000 jobs and channels spending into local supply chains including agriculture, building and construction, and cultural industries. The COVID-19 pandemic, international travel bans and reduced tourist activity have had devastating economic impacts on Fiji, pushing the country into negative GDP growth. The increasing severity and frequency of cyclones in late 2020 and early 2021 exacerbated existing social and environmental vulnerabilities. Whilst large hotels act as anchor investments in destinations, numerous services such as transport, food and beverage supplies, laundry, activities and even bottled water are provided by the micro, small and medium enterprises (MSMEs) that depend on tourism for their main source of revenue.

Oceania is the region at highest risk to climate impacts (WorldRiskIndex 2021) based on exposure to hazards and societal vulnerability with Fiji listed as fourteenth most at risk in an assessment of 181 countries assessed. Climate change poses a risk not only to natural and water systems, but also to the communities and economies reliant on them from both chronic (long-term) and acute (short-term) hazards. The tourism industry is already affected by climate change impacts. In Fiji and the Mamanuca Islands, tourism activity is focused along the coastline, which is of higher risk to climate change impacts (Arabadzhyan et al., 2020). Coastal tourism in Fiji, including in the Mamanucas, is already experiencing severe impacts from Tropical Cyclones and severe coral bleaching (Mycoo et al., 2022). Sea level rise is threatening coastal infrastructure even on islands of higher elevation (Kumar & Taylor, 2015), which may deter potential visitors (World Bank, 2021). Taking advantage of tourism's key role in Fiji's development, the research project undertook to better understand the situation for gender equality, disability and socially-inclusive (GEDSI) water, sanitation and hygiene (WASH) in resorts and the potential impact of climate change on this. This information will assist the resorts, surrounding communities and broader industry work towards climate resilient WASH for sustainable development of the tourism sector and in host communities in Fiji.

The project researched three key questions:

1. What risks does climate change pose to the tourism sector and GEDSI-sensitive WASH services in the Mamanucas?
2. How can GEDSI transformative WASH-at-Work programs support the climate resilience of existing WASH services for localised sustainable tourism development?
3. What are effective water stewardship approaches to support the adoption of a GEDSI WASH-at-Work program in the tourism sector that also address climate change impacts? How do these issues affect the business case for Mamanucas tourism?

In 2020 – 2021 the project team undertook formative research in Suva and the Coral Coast to explore these issues using a range of qualitative research methods. The project has expanded to include the Mamanuca Islands. Some of the key formative research findings relating to the Mamanuca Islands are described in this report. They note that:

- Larger resort hotels usually have high standards for water access, toilets and hygiene for their guests and staff, with regular training provided through Standard Operating Procedures;
- Water quality and maintenance of infrastructure (sometimes managed by the hotels) are concerns for communities surrounding resorts in the Mamanucas, with water scarcity a concern in the dry season;
- Whilst hotel staff report practicing good hygiene at work, this does not always translate to the home setting or to other community members;
- There are limited facilities designed to be accessible by people with a disability, the elderly, pregnant women or to support women's menstrual hygiene needs. Communities have minimal to no facilities accessible by people with a disability;
- As land owning units e.g. villages benefit economically from hotel/resort lease monies communities generally have good access to running water, flush toilets and shower facilities;
- Post-COVID-19 preparedness and recovery requires continued education, training and capacity-building initiatives that can address inclusive WASH in tourism, and GEDSI WASH-at-Work in particular;
- Resorts typically have some procedures to deal with natural disasters and emergency events.

By facilitating increased mutual understanding and collaboration between hotels, governments and civil society organisations (CSOs), the project is supporting Fiji to progress Sustainable Development Goals (SDGs) 6, 5 and 13 in and with local communities. The research findings presented here contribute to a value proposition that provides context-specific guidelines for hotels in the tourism sector to support and deliver a GEDSI WASH-at-Work program. GEDSI WASH-at-Work guidelines developed earlier in the project were shared with and socialised with Fijian hotel operators to enable them to consider improving GEDSI WASH needs in their hotels and local communities.

A range of recommendations have been drawn from the research for government, hotels, the tourism association, communities and all stakeholders, which are presented in section six of this report. These provide policy guidance for government and tourism sector stakeholders to build resilience to climate change impacts for hotels and tourism operators and improve WASH outcomes.

1 Introduction

1.1 Summary of the Research Project

1.1.1 Research Objective

The research project focused on the ways in which hotels can ensure they have climate resilient WASH systems and implement gender equality, disability and socially-inclusive (GEDSI) Water, Sanitation, and Hygiene at work (WASH-at-Work) programs in the Mamanuca Islands, Fiji. The previous Inclusive WASH-at-Work research case studies identified gaps in knowledge and capacities of hotels, their staff and surrounding communities with respect to safe health-protecting WASH behaviours and practices. An online workshop held in July 2021 saw increased interest from tourism operators located in water scarce areas. Since that time Fiji's borders and the tourism industry have opened to international guests, especially into water scarce areas in the Yasawas and Mamanucas. There was demand to extend the formative research to water scarce areas to understand their specific Inclusive WASH-at-Work issues, the applicability of already developed principles and guidelines, and the increasing challenges posed by climate change impacts to tourism and overall destinations. The Mamanuca Islands group was selected due to its small islands that are geographically dispersed and face limited surface water resources. The formative research utilised proven research tools (i.e. semi-structured interviews with tourism operator owners, managers and staff); and focus-group discussions with staff and community members, to identify opportunities for and barriers to improvements to Inclusive WASH in resorts and communities. Additional climate change questions were included in the research tools to address climate change, resilience and disaster preparedness. The formative research in the Mamanuca Islands is useful to provide a context-specific consideration of why accommodation providers and operators in the Mamanuca Islands should engage with Inclusive WASH-at-Work.

1.1.2 Research Questions

Three research questions were developed in order to effectively investigate how actionable guidelines could be created. They were:

1. What risks does climate change pose to the tourism sector and GEDSI-sensitive WASH services in the Mamanucas?
2. How can GEDSI-transformative WASH-at-Work programs support the climate resilience of existing WASH services for localised sustainable tourism development?
3. What are effective water stewardship approaches to support the adoption of a GEDSI WASH-at-Work program in the tourism sector that also address climate change impacts? How do these issues affect the business case for Mamanucas' tourism?

1.1.3 Research Approach

The research project used a predominantly qualitative approach to collect data from staff at resorts and community members. Due to cultural preferences for talk and discussion, the project adopted a

qualitative methodology to examine how the tourism sector in the Mamanucas currently invests in and/or supports WASH-at-Work and in local communities, if at all.

The project was conducted over two research phases:

- Phase 1: Inception: During the Inception phase the project team reviewed the outcomes and recommendations from the Inclusive WASH-at-Work project in Fiji to undertake formative research in the Mamanuca Islands as a water scarce area, which is also a popular tourism destination predominantly comprised of family resorts and community owned enterprises.
- Phase 2: Formative research: The project team completed semi-structured interviews with decision-makers (owners and managers of tourism sector operations) and interviews and focus-group discussions with staff and communities' members to understand barriers to and impacts from WASH-at-work and WASH in communities.

  This case study report is the key output of the formative research phase.

1.1.4 Overall Research Outputs

The overall project produced a GEDSI-integrated conceptual framework, a research methodology, and tools to gather data to support the articulation of a value proposition for GEDSI WASH-at-Work in the tourism sector. It examined links between employees' WASH practices in their workplace and those in local communities.

Previous research outputs produced by the project informed this additional field work. These include: [

- A value proposition that provides context-specific guidelines and tools for hotels in the tourism sector to support and deliver a GEDSI WASH-at-Work program.
- GEDSI WASH-at-Work guidelines and tools to enable tourism operators to consider their WASH impacts on local communities.

- Posters on priority WASH issues for communities produced in both English and Fijian to raise awareness for hotels and resorts to share with staff and surrounding communities.
- Policy guidance for government stakeholders to support hotels and the tourism sector to provide effective WASH outcomes through a GEDSI WASH-at-Work program.

2 Literature Review

2.1 Water Stewardship and Climate Change

The concept of water stewardship frames the research because it drives the idea of a holistic catchment-wide view of water management and value proposition. Current literature demonstrates that businesses can contribute to the alleviation of potential water challenges by adopting a water stewardship strategy that addresses the economic, environmental and social dimensions of water. By adopting water stewardship and addressing their risks, companies may make a positive contribution to improved WASH management and governance and, at the same time, to sustainable development. The contribution of business means adopting values and practices that aim to safeguard long-term availability of clean water and the provision of sanitation for all stakeholders in a watershed (SDG Compass, 2019). The values and practices reflected in the concept of water stewardship provide a means via which hotel operators may devise a rationale and an economic model for a GEDSI WASH-at-Work program.

Definitions of water stewardship are varied. Stewardship is seen as being the responsibility of the state (Calman, 2009), the responsibility of private actors (Morgan, 2018; Hepworth, 2012; Sojamo, 2015) or that effective stewardship requires both state and private actors to work together (Loftus, Smardon, & Potter, 2004). Similar debate occurs in relation to stewardship practices (Hepworth, 2012; Orr & Sarni, 2015; Lange & Shepheard, 2014; AWS, 2020) and aims (Calman, 2009; Lange & Shepheard, 2014). The common ground is that stewardship is about taking care of something that we do not own (AWS, 2020). This conjoint definition has framed the project's thinking to prevent an unnecessary narrowing of the scope and to avoid an initial focus on the specifics of the who, what or why.

Climate change is having, and will continue to have, profound impacts on ecosystems, livelihoods, economies and societies causing up to 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress (WHO 2018). Oceania is the region at highest risk to climate impacts (WorldRiskIndex 2021) based on exposure to hazards and societal vulnerability with Fiji listed as fourteenth most at risk in an assessment of 181 countries assessed. Climate change poses a risk not only to natural and water systems, but also to the communities and economies reliant on them from both chronic (long-term) and acute (short-term) hazards. Practising good water stewardship is increasingly challenging but important in the face of less predictable and more severe climate impacts. According to the IPCC's lates assessment report, the Pacific freshwater systems are among

the most threatened globally (Mycoo et al., 2022). In the Pacific, climate change can increase the risk of water shortages, saltwater intrusion, and waterborne diseases (Mycoo et al., 2022).

2.2 Gender Equality, Disability and Social Inclusion

Gender equality, disability and social inclusion (GEDSI) has been integrated into the water stewardship frame because:

- It is required to create a viable value proposition and an innovative and sustainable WASH-at-Work program that is anchored in and addresses the complex societies of Fiji and Indonesia and their tourism sectors as contexts for the research.
- The United Nations guiding principles on business and human rights guide this research project's outcomes (UN, 2018).
- The project is alert to the conceptual and social merit of using the World Bank's International Finance Corporation's definition of social inclusion as people who are 'disadvantaged or vulnerable' due to "factors such as age, ethnicity, culture, [gender diversity], literacy, sickness, physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources" (IFC, 2012).

It is broadly recognised that gender equality is central to economic and human development as equal opportunity for women and men and members of socially vulnerable groups supports economic growth and helps to reduce poverty. GEDSI is critically important to achieving broad social development objectives, to improving the effectiveness of efforts to reduce poverty and support economic growth, and is important on the basis of human rights (DFAT, 2021). Gender is consistently revealed as a critical cross-cutting element for improving access to WASH and for the effective realisation of water as a human right (Women for Water Partnership (WfWP), 2019). A range of studies have examined the unequal gendered power relations embedded in the tourism industry (Duffy et al, 2015; Ferguson, 2011; Gentry, 2007; Schellhorn, 2010), but few have investigated the unequal impacts of tourism on women and men, or the gendered impacts of tourism in relation to water (Cole S. , 2017). While "women are responsible for domestic water provision and management" (Cole S. , 2017) in many communities, because women's work is often unpaid, unrecognised and 'naturalised', they live with water privation and pollution.

Communities in the Mamanucas live in a multi-hazard environment in relation to climate change, where cyclones, floods and droughts impact frequently. The impacts of disasters are unequal among women and men, the young, elderly and disabled, all of whom have distinct vulnerabilities and varied capacity to recover. The most vulnerable in communities often lack decision-making power and access to information, and may have less capacity to prepare for disasters and deal with their aftermath. GEDSI can enhance an enabling environment for local communities to effect actions that enhance climate resilience, disaster risk reduction, and adaptation.

The integration of GEDSI into climate change considerations has shaped reflection about, and has been integrated into, the project's focus on WASH. Water access and WASH programmes support the health and sustainability of people in communities that have no access to safe drinking water nor to proper sanitation. These programmes may involve policy, public sector capacity building, community education and awareness (Rozaa, et al., 2013) and the GEDSI-responsive budgeting that is required to ensure that commitments and policies that support the WASH needs of women, girls and the socially vulnerable are put into practice. WASH programmes can also support the protection of water sources through community water partnerships.

2.3 WASH-at-Work in the Tourism Sector

A key objective in the WASH sector is to provide equitable and universal water and sanitation services and access, thus protecting health and promoting development. An allied objective is to promote behavioural changes essential to realising the full benefits of WASH services. These objectives cannot be met without the full participation of women and members of socially vulnerable groups (ILO, 2016).

Existing WASH-at-Work frameworks consider the role of employers in providing sufficient access to water, sanitation and hygiene services in the workplace, as well as training and knowledge to staff to ensure good hygiene practices which safeguard both staff and guests. WASH-at-Work also considers more broadly the role of businesses to ensure adequate WASH services through supply chains and surrounding communities. However, GEDSI considerations of WASH-at-Work remain relatively unexplored, particularly in relation to socially inclusive engagement and decision-making. Consequently, the project recognises that the value proposition for any WASH-at-Work program in the tourism sector must be shaped by and integrate GEDSI into its design, management and outcomes.

The value proposition for businesses to increase investment in WASH is established, because businesses that invest in WASH have increased productivity (WaterAid Canada, 2017) and an increased social license to operate (USAid, 2017). However, the literature shows that, even with these proven benefits, there is a low uptake of WASH programs in private businesses, with only a handful of companies signing on to the CEO Water Mandate (CEO Water Mandate, 2012). Research also suggests that WASH programs need to be tailored to their proposed context, as acknowledged in water stewardship approaches that have been developed for multiple sectors, including hotels in the tourism sector (Global Water Partnership, 2014).

The lack of alignment between evidence of positive benefits to businesses and the lack of private sector uptake of WASH programmes show that the issues are more complex than providing a simple business case focusing purely on commercial benefits. Rather, research suggests that WASH programmes need to be tailored to their proposed context, as acknowledged in water stewardship approaches that have been developed for multiple sectors, including hotels in the tourism sector (Global Water Partnership, 2014). There is, however, a lack of robust monitoring and evaluation of

water stewardship frames and WASH programs, with both usually failing to consider the gendered social relations within and gendered impacts on local communities (GWA, 2019).

2.4 Enabling Environments for Scale Up

Several factors present in the governance of institutions or systems may affect the ability of a country to implement and scale up any of the findings, recommendations, or outputs of this research. The factors are often referred to as 'enabling factors' or as barriers that may inhibit change within a particular enabling environment. Common elements which allow an assessment of the 'health' of the enabling environment include policies and strategies, institutions and human resources, coordination and planning, regulation, financing (capital and recurrent costs) and monitoring and evaluation (CS WASH Fund , 2017).

The literature review of the WASH enabling environment has identified numerous examples of aspects to be considered, which have been used as a springboard for analysis (Brown & Farrelly, 2009; EAWAG, 2011, Farrelly & Brown, 2011; Mukheibir, Gallet, & Howe, 2014; OECD, 2011; SWA 2021; Rauch, Seggelke, Brown, & Krebs, 2005; Wang, Walker, & Redmond, 2007; Willetts, Murta et al. 2015). Final frameworks for analysis were based on these to incorporate as much available knowledge as possible, and also referenced WASH enabling environment frameworks that consider climate change (Howard et al. 2021; WaterAid 2021). The framework used in this project includes the following six factors

- Government support: the long-term vision of government and coordination between government partners.
- Knowledge and skills: the skills and capacity of the workforce, as well as the sectoral capability present in-country.
- Political economy: the political will, support and potential risk aversion of the government, as well as the perceived/planned role for the private sector.
- Regulation and enforcement: the existence of regulations and the ability of a sector to enforce those regulations.
- Institutional arrangements: organisational and administrative structures inside organisations, as well as agreements, including cost-sharing and financial agreements between organisations.
- Engagement: engagement between government, communities and organisations.
- Infrastructure: the ability of infrastructure to withstand or resist climate shocks and impacts meeting specified design standards.
- Environment and water resources: extent to which hydrological system changes impact environmental values, services and WASH service delivery.

All these elements need to be considered within a specific GEDSI WASH-at-Work context to understand the broader systems in which relevant stakeholders operate and the climate impacts affecting those.

3 Case Study Area Selection

3.1 The Fiji Context

Tourism in Fiji was an expanding industry that became a priority sector for the Fijian government to achieve sustainable economic growth and to reduce the nation's economic dependence on sugar as an industrial mono-crop. The Fijian government employed actions such as increasing and strengthening the tourism sector through inclusive sustainable development growth, where social, economic and environmental aspects of such growth were evaluated and considered throughout the planning or implementation of any project. Whilst strategies to increase tourism in Fiji remain a key government objective, strategic planning has not considered important factors that contribute to the development of sustainable tourism, such as gender equality, broad-based social inclusion, and WASH practices. Since the outbreak of the COVID-19 pandemic, effective WASH practices are now of considerable concern to the sustainability of Fiji's tourism sector.

In early 2020, tourism contributed an estimated 17% of Fiji's GDP and provided direct and indirect employment to an estimated 118,000 people (IFC, 2020). According to the National Fijian Tourism Plan, tourism has been the source of both national and familial income due to its capacity to provide skilled employment; it supports, on average, one-third of Fiji´s total labour force (Investment Fiji, n.d). Although tourism in Fiji has contributed significantly to a reduction in poverty, impoverishment remains a key social problem. The remote location of many outlying islands poses difficulties in providing quality education, health and public services such as WASH.

Due to the vital role of the tourism sector in the development of a sustainable economy in Fiji; the government created the Ministry of Industry, Trade, Tourism and Transport (MITTT). The Ministry's Strategic Plan (2018-2023) recognises that tourism is a crucial sector in the Fijian economy as it is the largest contributor to Fijian GDP. The Ministry promotes and strengthens the sector by formulating and implementing policies and plans, such as the Fijian Tourism Plan 2021, to achieve its vision of a $2.2 billion tourism industry by 2021, with a focus on quality tourism and the creation of links to the agriculture and manufacturing sectors. This objective was not achievable with the advent of the COVID-19 pandemic and closing of Fiji's borders in 2020. Fiji tourism international arrival statistics in 2020 were 236,000,000.00, a 82.45% decline from 2019. Total visitor arrivals for the year as of 30 June 2022 stood at 205,529. The average growth rate over the last 6 months was 42%. Australia continued to be the largest source market to Fiji, accounting for 54% of arrivals in June 2022. This is followed by New Zealand and the United States, which accounted for 24% and 13 %, respectively (MCTTT,2022). The National Development Plan also provides strategies to facilitate tourism growth by ensuring its sustainability. The strategies include strengthening the linkage between human resources and the tourism industry, implementing environmental taxes to conserve and preserve ecosystems and cultural heritage, and investing in tourism-related infrastructure such as roads, ports, water and sewerage

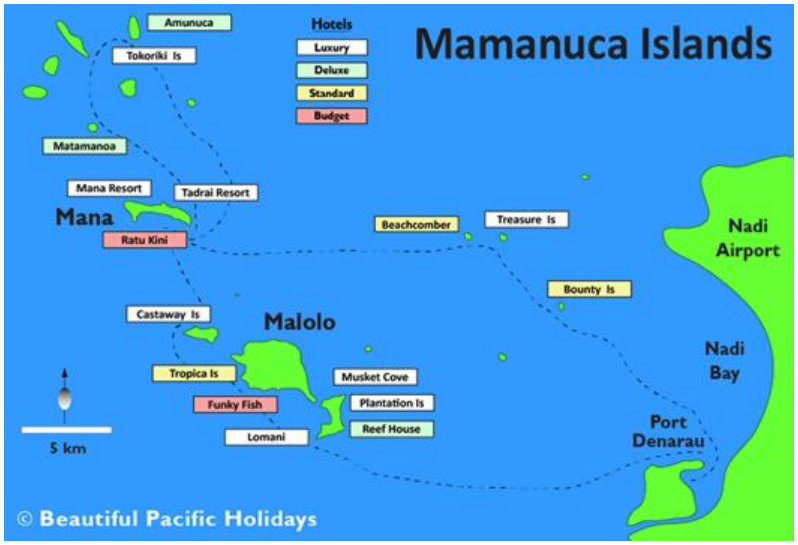
systems (Investment Fiji, n.d). Embedding sustainability, social inclusion and WASH considerations, into tourism recovery strategies is critical to ensure the sector does not pose further stress on the wider community and ecosystems. For example, tourism, together with population growth and urbanisation, already place increasing pressure on limited freshwater resources, leading demand to exceed supply on many small islands (Mycoo et al., 2022).

Fiji's tourism sector is also at risk of the impacts of climate change, including the increased intensity of tropical cyclones, coral bleaching and marine-biodiversity loss, sea level rise and increased inundation and erosion (Mycoo et al., 2022; World Bank, 2021). To begin to address such risks Fiji has developed the Climate Change Act (Fiji, 2021), the objectives of which are to provide a framework by which Fiji can develop and implement clear and long-term climate change measures and policies that will safeguard the future of Fiji's people, ecosystems and biodiversity in the face of the climate emergency. The Act has been designed to also enable Fiji to meet its international Convention and Paris Agreement obligations and to facilitate the evidence-based consideration of climate change issues in both government and private sector decision-making.

The case study area (CSA) chosen encompassed four resorts in the Mamanuca Island Group namely, Plantation Island Resort (PIR) and Lomani Island Resort (LIR) on Malololailai Island and Malolo Island Resort (MIR) on Malololevu Island and Castaway Island Resort (CIR) on Castaway Island. The Mamanuca Islands group was selected as this area has small islands that are geographically dispersed and face limited surface water resources. The formative research utilised research tools already developed (semi-structured interviews with tourism operator owners, managers and staff); focus-group discussions with staff and community members to identify opportunities and barriers to improvements to Inclusive WASH in resorts and communities. An additional climate change angle was also included in the research tools to address climate change, resilience and disaster preparedness. The formative research in the Mamanuca Islands was useful in terms of providing a context-specific understanding of why accommodation providers and operators in the Mamanuca Islands should engage with Inclusive WASH-at-Work.

3.2 Tourism in Mamanucas

The Mamanuca Island Group consists of about 32 islands off the Western coast of Viti Levu. Their closeness to Nadi and the location of many popular budget and boutique resorts makes it a popular destination for day-trips from Nadi and Denarau. Tourists travel to this area during the months of June to October, with the main tourists being from Australia and New Zealand, and the main markets are multi-generational families, singles, couples and honeymooners.



A tourist destination such as the Mamanuca Island Group consists of a variety of stakeholders, including tourism businesses such as resorts, transport, activities, groups such as the Mamanuca Environmental Society (MES), community groups and non-governmental organisations (NGOs). Moreover, the destination is characterised by different attractions, both natural and cultural, has a broad range of infrastructure and the kinds of activities in which different types of tourists engage. Research into the vulnerability to climate change requires a variety of methodologies (Adger, 2006; Becken, 2009). Given the complexity of tourist destinations, previous studies have conceptualised destinations, including in the South Pacific, as complex adaptive systems (Loehr, 2020; Movono et al., 2017). In order to intervene in the system, e.g. to enhance outcomes for host-communities, it is paramount to understand the system in detail and describe its key features, including relationships between components of the system. In a tourism context, attributes could be the ongoing sustainability of key tourism activities, such as water supply, transport, diving or water sports.

Fiji is the largest tourist destination in the South Pacific with its tourism development linked to marine environments (sun, sea, sand and dive tourism) and over 60% of tourists participating in swimming and snorkelling and 12% in scuba diving (Becken, 2004). The Mamanuca Islands are an important tourist destination in the Fijian group of islands, however, they are highly vulnerable to climate change. In studies undertaken by Becken (2004, 2005) the Mamanuca Islands group accounted for an estimated 88,341 visitor nights (17.3% of all nights in Fiji) and was an extremely important generator of employment in the area (GRM International, 2007). The Mamanuca Islands offer 808 guest rooms in 23, mostly up-market, accommodation properties. The key activities undertaken by tourists throughout Fiji are relaxing on the beach, swimming, snorkelling and diving. Increasingly, tourists are participating in cultural village tours.

Climate change is globally recognised as a major crisis of the 21st century with the potential to threaten humanity's existence. Global evidence-based research recognises that climate change is not limited to biophysical impacts but has profound social implications, with the poorest and marginalised

communities being most severely impacted, resulting in a widening of social and gender inequalities (Islam and Winkel 2017; OHCHR 2019; Pross et al. 2020). The International Panel on Climate Change has identified the Pacific as among the regions that are most vulnerable to the climate change impacts via disasters emanating from extreme weather and climate-related events, a trend that is increasing and is expected to continue (IFRC 2020, UNESCAP 2019). When added to the rapid socio-economic changes caused by globalisation, urbanisation, infrastructure development, population increase, migration, tourism, and COVID-19, plus accompanying conflicts and political tensions (Kelkar 2009), the impacts of climate change will have major consequences for the social, economic, and political development of the region.

Fiji's climate is oceanic tropical, with a dry season from May to October and a wet season from November to April. The wet season – including the holiday peak season around Christmas – is also the cyclone season. Rainfall patterns are determined by the south-eastern trade winds, resulting in a wet east and dry west (including the Mamanucas). The El Nino Southern Oscillation affects Fiji as it influences the position of the Southern Pacific Convection Zone. During El Nino events (about every 7 years), the weather conditions in Fiji are drier and hotter than average. The Mamanuca Islands are greatly susceptible to cyclones, droughts and increasing sea temperatures, which have had a great impact on coastal erosion, water shortages and coral bleaching among others (Fiji Meteorological Service, 2006). In 2000, a large coral bleaching event led to the damage of parts of the coral reefs due to high water temperatures (Cumming et al., 2002). The Mamanuca Islands are low-lying atoll islands, and as such are vulnerable to sea-level rise. According to a survey among accommodation operators, tourist resorts face problems with beach erosion and water quality (Becken, 2004). This has been evident in the current research at Plantation and Castaway resorts and observations of such resorts as Beachcomber. As with our findings, the same group of stakeholders in the Morena and Becken study in 2009, identified cyclones as the most important impacts from climate change to their (often uninsured) businesses. Cyclones also were a hazard to the local communities and tourists and they damaged natural resources, including beaches and coral reefs. Cyclones such as Winston and Evan in 2016 greatly impacted tourism in the region. Also the risk of coral bleaching can have a great impact on diving/snorkelling in the area.

Prior to the advent of tourism, the Mamanuca Group were the fishing grounds for the people of Viseisei in Vuda, who are the landowners of many of the islands in this area. Most of the islands are uninhabited due to the lack of fresh water. Only three of the larger islands Malolo, Yanuya and Tavua have fishing villages. Tourism has provided much needed income for the peoples of these islands with most village households earning revenue from tourism either as landowners or via employment at resorts. With easy access from Nadi to the Mamanucas available through South Seas Cruises and other transport operators, and the wide variety of resorts, this region is a prime sun, sea and sand destination for Fiji. Tourists to this region engage in a wide variety of activities including snorkelling, scuba diving, game fishing, jet-skiing and kayaking. The islands of Namoto and Tavarua have become well known for world-class reef surfing off Malolo Barrier Reef.

This study visited four resorts in the Mamanuca group namely: Plantation Island Resort and Lomani Island resort on Malololaila and Malolo Island Resort and Castaway Island Resort on Malolo Island. Keynote interviews and Talanoa Sessions were also undertaken at Solelvu Village on Malolo. Number of research participants is shown in Table 1.

TABLE 1. RESEARCH PARTICIPANTS BY LOCATION AND GENDER

Type of interview	Location	Respondents
Keynote interviews	Solevu	2 Male
Focus Group Interviews	Solevu – 1 male and 1 female	11 Male 16 Female
Keynote interviews	Plantation Island Resort, Lomani Island Resort, Malolo Island Resort, Castaway Island Resort	Plantation – 4 men Lomani – 1 women Malolo – 3 men 2 women Castaway – 4 men
Focus Group Interviews	Plantation Island Resort – 1 male and 1 females	Males - 4 Females – 3
Focus Group Interviews	Malolo Island Resort – 1 male and 1 female	Males - 7 Females - 2
Focus Group Interviews	Castaway Island Resort – 1 male and 1 female	Males - 7 Females - 4

4 Results

The data-driven thematic analysis identified eight key themes emerging from the data, which are presented in Table 2 below.

TABLE 2. FORMATIVE RESEARCH FINDINGS

Themes	Statements	Comments
1.Water Supply *Hotels and community*	No, the resort does not test the community water regularly. Yes, the water from local sources are clean (Solevu Village (M)_FG) Desalination plant. The old plant operated for 26 years so as soon as he started, he changed to the new one (3-reverse osmosis). Now the desalination plant produces 210, 000L per day to cater for the demand which averages 100,000 litres per day (max of 140,000 litres/day). This is usage by the Resort operation, staff village and the pools. When sea water is pumped in from the sea for desalination, it goes through a vigorous process – into a sand filter tank, where the separation occurs. Water is then pushed into the reverse osmosis plant, whereas the brine water is pushed back into a pipe and flushed back out into the sea. There is no environmental impact on the return of salt into the sea. Acura [resort ownership group] provides water tanks to the Kindergarten and village of Yaro when the need arises. In 2017-18, 3-4 tanks were provided by the Group. The Youth Leader formed a registered youth group within his clan. The group was registered with the Ministry of Youth in 2017. Most of the village youth are also employed at the nearby hotels. Their first fundraising achieved a total of $10,000 which funded their water project (purchase of water tanks and pumps for village) and their honey project which saw the purchase of 3 boxes and bees. (Solevu Village_FG)	The communities in the Mamanucas rely on boreholes and rain for their main water source. All homes in the communities have at least a water tank, which is to gather rainwater and this is used for drinking. Water from boreholes is connected to their homes via holding tanks placed in different locations around the village. Hotels in the Mamanucas have desalination plants, which are their main water source. Over the years, new technology has delivered sophisticated systems which enable the bigger hotel properties to meet water demand during peak tourism seasons. As a gesture of consideration to their guests, resorts offer bottled water to them upon check in. The guests are then advised that refilling stations are located around the property, which they can use. Desalinated water is safe to drink, however it is an acquired taste. Resorts in the Mamanuca assist communities by purchasing water tanks for schools, community halls and individuals. Generally, community members themselves raise funds to address their water needs; by purchasing water tanks, pumps, pipes and other items needed for plumbing. The resort does not do testing of community water supply on a regular basis.
Water use	Drinking, cooking, shower, cleaning, washing, laundry, pools, sprinklers. Water is used for drinking, washing, shower, sprinklers, cooking in addition to pools, sprinklers (recycled water). (Malolo_Staff_FG)	Water usage in the Mamanucas is consistent with the everyday use of water for anyone. In the resorts, water is used in the accommodation, pools, dining areas, bars, kitchens, laundry areas, public areas and maintenance/landscaping. However, resorts use considerably more water than households, e.g. when comparing water

		requirements for one guest night with the daily water requirements of a local resident. The Staff who live in the Staff Village use water for cleaning, showers, toilets, washing and in the kitchen.
Desalination plant	The old plant operated for 26 years. There is a new one now (3 reverse osmosis), . Now the desalination plant produces 210, 000L per day to cater for the demand which averages 100,000 litres per day (max of 140,000 litres/day). This is used by the Resort operations, staff village and the pools. When sea water is pumped in from the sea for desalination, it goes through a vigorous process – into a sand filter tank, where the separation occurs. Water is then pushed into the reverse osmosis plant, whereas the brine water is pushed back into a pipe and flushed back out into the sea. After 3 years with CIR, I decided to change the whole system for better water quantity, quality and supply. The main reason for changing the system was because the current ones are not able to accommodate the current operation demand. The 2 reverse-osmosis previously install was not producing enough water. In 2021, it was only able to produce 70,000 litres, this was not enough for the whole Resort. Other reasons for replacing the 2 to 3 because of continuous breakdowns. Previously, the old system was only producing up to 90,000 litres per day. We had only a single 500,000 litres water storage tank. During full occupancies and peak season, water in this tank is used up in 5 days only. Rain water collection is directed to the main water distribution system. These then goes through the ultra-violet system for cleansing and chloride. I feel that the desalination system is part of the problem. This is because the extracted salt is pushed back into the sea and that's the cause. And it's not only CIR, but the whole of the Mamanuca group has its own desal plant. That's what I think, salt concentration is too high for the marine life around here. I have noticed too that the marine life around that end of the beach, where the desal water treatment plant is located, there's hardly anything there, compared to this side of the beach front. Desalination outlet is back into the sea. I informed him that it was probably 100m off shore: he mentioned that in Australia, it's 45km away (Castaway) We are lucky to have a desalinisation plant which provides all our needs. At present we are on 930,000 litres. We should reach 1 million litres in the next few days and will then shut down. This is our maximum capacity (Castaway). Guests drink bottled water or can refill with desalinated water from bar and taps in room (Castaway). All staff used desalinated water for all these purposes. Drinking water encouraged to be boiled (Castaway) If there's anything better than this – I'd love to have that. I don't think having rain water tanks will work here, because it hardly rains. If it does rain, the water collected will only last for a few days before the tanks are dry and will remain dry for the next 3 months. Unless they cart fresh water from the mainland – than it would be good (Castaway_Staff_FG) All water into the guests' rooms is from the desal plant. They have the option to buy bottled water from the bar (Castaway_Staff_FG.) Bottled water for guests to drink, rainwater and desalinated water for other uses. Rainwater is filtered and UV treated. There are plans to eliminate plastics and put water stations around the property. We are still in the	Hotels in the Mamanucas have desalination plants, which i are their main water source. Lomani shares the desalination plant with Plantation resort as they are managed by the same company. Rainwater is also collected at resorts. See comments above.

	process of figuring out which type of water to go into the water filling stations around the Resort - whether this be rainwater or otherwise. We have not reached a solution yet. (Lomani) The Desalination plant at Malolo Resort produces around 500,000 litres while on a normal day full capacity resort uses around 55-60,000 litres of water. (Malolo) In terms of water supply for Likuliku resort, it has its own. (Malolo_Staff_FG) Now the water from the dam is used as reserve. Most of the times, it's used at the staff quarters for showers. (Malolo_Staff_FG) If there are some problems with the desal plant, then we test the water in the dam, if it's good, then it's supplied to the guests' rooms. Additionally, when Likuliku needs water, we can pump our desal water across to them. Likuliku has its own desal plant though. When they run into problems, that's when we supply them from our side (Malolo). In the event of high salt taste in the water, we use some of the dam reserve with the desal water. The desal systems are also checked to find out the problem. (Malolo_Staff_FG) Separate distribution reserves in water tanks desal, drinking water, recycled for gardens, toilets. Plantation In terms of water supply, he feels the water in the taps are safe to drink. Drinking desalinated water has an acquired taste. Their rainwater tanks store fresh water. (Plantation) Drinking water are provided to guests upon arrival (2 Aqua safe 1.5L bottles) and they can be refilled at the water stations which contain filtered freshwater. Otherwise desalinated water is used for shower, brushing, cleaning, laundry, gardens, etc. (Plantation_Staff_FG) The ocean which goes through the seawater pumps in a reverse osmosis system. The desalination plant also service Lomani Resort which has a dual system (desalination and solar) (Plantation + Lomani) During peak season (Resort full period) pressure reduces. Then into salt water holding tanks, into pressure pumps which push the salt water through the reverse osmosis plants. PIR has the ability to produce up to 550,000 litres of freshwater/day. This is maximum capacity at 24hrs running. (Plantation + Lomani)	
Water supply risk	The biggest challenge here is this hotel was built a long time ago and now the pipes are old and for many cases, roots have pushed its way into these pipes, causing bursts and blockages. It takes up to 2 weeks to find a leakage, because infrastructure has been built over the water pipes. That's a main issue too, when new buildings are being planned, those in charge of plumbing and power works are not involved. These causes pipes and connections to be covered by buildings etc. Here on CIR, a big challenge for me is to locate the connections underground. So, the only way is to close of water systems and go through each of it. (Castaway) Yes, contaminated water due to tanks/pipes affected by debris, etc. Feel that water tanks should be properly secured perhaps within closed walls to lessen risk of contamination. (Plantation Staff_FG) There are risks to water loss through pipe leaks found through cameras, poor pluming works, risk of 'hungry' water from desalination plant can burst water tank. All pipe material needs to be plastic or pure stainless steel. Solar collectors run through copper tubing which can eat through the pipes. (Plantation + Lomani) Major risks to PIR's water supply - Losses (of water due to leaks). When I got here, plant was not producing the amount of water it was capable of. - 220,000 litres of water loss every day, this was the found out after fixing up the leaks	The resorts indicate leakages are a key risk. This is due to old piping and water systems, on top of poor planning in the initial development of the properties. Repairs to these decades-old systems are costly. The majority of the piping systems used copper pipes. These are at risk of corrosion due to salt content in the desalinated water; over time the copper corrodes. Contamination of water source is a concern. However, this risk is not perceived to be as major as the two previously stated.

	- Leaks happen all the time, due to tree roots strangled inside pipes and breaking them. Excavator breaking pipes. Risks to the water tanks - Desal water is aggressive, aka hungry water. Once minerals are taken out of the water, it will try and remineralise itself. When it comes into contact with metal, it will try and dissolve the metal, and remineralise itself. As a result, it causes a lot of corrosion. - Leaks caused through corrosion, creating holes. (Plantation) Bore hole contamination. (SolevuVillage_FG) Risks to Solevu's bore hole water system include extended drought periods – when levels are reaching a certain low level, they can taste sea water. This happens, we think because there's not enough water in the bore hole, and when it's high tide, it ends up in the bore hole source. In the past 2 years, twice we've had critically low levels of water from the bore holes. This was mainly due to the weather – long drought periods. (SolevuVillage_FG)	For the communities, members highlighted changing weather patterns as a high risk to their water source. Because they solely rely on boreholes and rain, during prolonged dry season, water levels drop to a critical low. When this happens, those in leadership contact the government's administrator to cart water to the villages in a barge. Additionally, they also indicated that a better power source to run water pumps needs to be provided, as the current solar power is not very effective.
2. Governance & Policy *Collaboration and partnership required*	Apart from working with the resorts, we are also the MES reps to the communities which is basically carrying out environmental awareness when the need arises	The majority of collaboration and partnerships between resorts in the Mamanuca group is through the Mamanuca Environmental Society (MES).
Communication and consultation on tourism policies	The resort doesn't do much engagement with the community directly. (Castaway Staff_FG) "Government programmes to support CSR like covering costs of transportation, accommodation to encourage hotel properties to give back to the community". (Plantation)	Some respondents noted that the resort could engage more directly with the community on WASH issues. There were recommendations for government to subsidise costs for transport or accommodation to encourage hotels to give back to the community.
WASH Policy	Yes, through the commitment to the community of Yaro. (Malolo)	Some resorts currently have policy statements to address the WASH needs of staff and the WASH needs of local people in the community.
Leasing of land	Mana Island Resort leases from Yaro village. Boats also pay landing fees. (Castaway) Castaway Island sits on Qalito Island (leased land) which is owned by the chiefly family of Solevu village. (Castaway)	Some resorts were on leased land was owned by nearby villages.
Tourism plans, policies and legislation	We are not familiar with that – our managers will know best (Malolo staff_FG) We are pushing hard to get more policy support and far more support structures in place that the industry can tap into. Demanding improved behaviour has to be inculcated into policies and legislation before we get more serious understanding and wider acceptance (Fiji Hotel and Tourism Association, FHTA)	There was low awareness on WASH policies in particular, However, some respondents noted knowledge about tourism plans with the Ministry of Tourism and Tourism Fiji. There were also conflicting responses from staff who were not aware of any tourism plans or policies but noted that their managers may have better knowledge on this.

		It was noted that FHTA is one of the organisations at the forefront of gathering policy support particularly around supporting business practices that acknowledge and address weather extremes.
3. Culture *Culture as tourism attraction & unique identity*	Yes, in our menus, activities. We have traditional Fijian dishes – lovo, kokoda. Mekes – our traditional dances. (Castaway_Staff_FG) There's Fijian Nite on Saturdays, so everything Fijian is showcased there, from the food to kava session. In our activities too, it's Kava ceremony evening on Wednesday. So the boys inform guests what kava is, what happens during the ceremony and how important kava is in our culture… Guests get very interested, and we then get requests from guests for own family kava ceremonies, that's apart from the Wednesday night ones. There are cooking lessons also – ika tavu – (open fire cooking of fish, similar to a bbq). Guests can also participate in the preparation of lovo – like uncover the earth oven when it's ready – take out the items that were in the lovo, those small tasks. (Malolo_Staff_FG) Culture is critical – studies mirror that destinations without cultures or customs are not- preferable. Cultures & Customs must exemplify as part of Cultural Tourism and tourists pays for Galleries, Museums, Art, Shows, Events, Cultures, Beliefs, etc. For example, 50 million tourists visits Varanasi every 4 years for the Kubu Mela; 12 million tourists visit the Royal Palace; over 600K tourists visit Cuba & Havana purely for its culture aspects & music; Plantation Indigenous people's cultural beliefs and practices that could be leveraged. (Plantation) Yes [Management respects culture] because all of the managers and supervisors here are locals, so they understand the local culture, that way, it's easy for us staff to make requests. (Castaway_Staff_FG) [Management] demonstrates respect for local culture – yes. (Castaway_Staff_FG) Our managers also accommodate leave requests when it's to do with some family obligations, again subject to availability of replacement or during low season. During peak season, there are guidelines, like unless it's parents, spouse or children, then they will consider. But we also need to apply in advance. (Malolo_Staff_FG) Definitely, because the owners are locals, all our managers and supervisors are indigenous Fijians too, so they understand the culture – so there's no problems there. (Malolo_F) Most definitely both expatriates and locals themselves in key positions [respect culture]. No expatriate should be recruited unless they have attended a course (orientation) on local culture and customs like remote mining companies. No one in any key department roles should hold that position unless they have attended similar courses. (Plantation)	Fijian beliefs and cultural practices are recognised and, where relevant and respectful of local culture, are included in the Mamanucas' hotel/resort practices and entertainment.
Hotel success factors	High level of returnees with relationships created with staff over time. Friendly service, Free Kids Club, Good food, Beautiful environment and Diving. Able to visit many neighbouring island resorts. Safe environment for elderly and children. We also have excellent access to the resort i.e. 3 times a day e.g. Sea Fiji, South Seas Services and Mamanuca Express. (Castaway) The facilities Castaway Resort has, they want to preserve the unique [sense] of the island and how it's been since it was opened. The look of the place is not too modern as noted in other newly refurbished resorts. Here at CIR, guests can step back in time – there's no rush. Also, guests enjoying the fact that they're able to experience the same vibe their parents had when they first holidayed here during their honeymoon. So the 2nd	

	generation is having a feel of what Generation 1 had, and that's something they'll treasure. Living the stories which their Mum and Dad had back then. (Castaway Staff(F)_FG) Successful: service, staff hospitality in the bula spirit. (Lomani) Success: repeat guests, holiday experience, staff service delivery, bula spirit, food. The staff, the management – it's just how they manage the business financially especially. The welfare of staff is well taken care off by the staff – so there's low staff turnover. Maybe because the owners/directors are locals; they give us pay rise, we have free accommodation on island, free transport, 3 free meals. We don't cook our own meals when we knock off work. So we're able to save our money here as well. Also, the relationship between the senior management down to the staff, very open communication – it's a healthy relationship is what I can say. (Malolo Staff_FG) Success factors: Affordability, top kids club across the Mamanuca resorts, its range of activities and restaurants, location. Incentives to staff which include 2 meals per day, having a staff supermarket, shifts are either 12-3, 6-1 or 18-4, staff accommodation with two people sharing a room, a separate staff kitchen and staff don't have to pay for water and electricity. New staff have a probation of 3 months appointment which is reviewed by the Head of the Department, a one-on-one session between the department head and employee, a SWOT and guest feedback. (Plantation)	
Tourism – negative impacts	There's also guests who step onto the coral, even though they have been asked not to stand on coral, no snorkelling during high tide. This is particularly evident with Chinese tourists, when they come for holidays during the Chinese New Year period. Some even bring back seashells and other creatures from the reef back to their rooms. Despite having Chinese translators who relay all best practices to them, they do not follow them. We are usually on very high alert when they come over for their stays. Reef life - The divers who take guests out for diving usually comment on how the reef is 'dying' there are no vibrant colours of coral and fish alike. A guest who has been coming over for holidays for the past 20 years has also mentioned how the reef life is deteriorating now. He usually comes up to me and states, 'Koli, the reef is dying! There's hardly any colour in the reef now.' The divers change their dive site regularly and the sad story is the same. The dive sites here in the Mamanuca is not only used by the resorts in this region, but those from mainland too, including those on Denarau. In some parts of the water in front of the Resort, one can see the marks of the propellers, regrettably, this is from our very own boats. Some staff still have their engines on when they approach shallow waters, which has caused this. Why do you think the reef is like this around this region? - I feel that the desalination system is part of the problem. This is because the extracted salt is pushed back into the sea and that's the cause. And it's not only CIR, but the whole of the Mamanuca group has its own desal plant. That's what I think, salt concentration is too high for the marine life around here. I have noticed too that the marine life around that end of the beach, where the desal water treatment plant is located, there's hardly anything there, compared to this side of the beach front. (Castaway) [Risks include] high prices and crime. In future we may not be affordable to visitors and they will go elsewhere. May not be value for money. Crime means more security and expenses. (Castaway)	A damaged reef and fish marine environment was considered a key negative impact of tourism, with rising crime and prices also noted.
4. GEDSI	[Tourism can negatively] impact family life, especially for married women having to leave family and coming to live on the island for over a long period of time. Impact on the marine resources. Development can impact the	A key negative impact, particularly for women, was the length of time they needed to spend away from their families and children.

	natural environment in a not so good way. For example, on this island, if they have to build more rooms, then it has to go upwards, and no more single units or over water. There is hardly any space on land. On the Fijian culture – how we dress, even to our hairstyle, how we speak. This is because we are in constant interaction with these international guests who come in with their own culture and behaviour and we would locals, like to have that too. Peer pressure. Also teachings, especially for some mothers, they'd like their child(ren) to have what these oversess kids are having too. (Castaway_Staff_FG) Noise pollution, diseases/pandemic, shift from agriculture to tourism especially for younger generation, drugs on vessels. (Castaway_Staff_FG) Taxes, Fraud unregulated operators, No Tourism Police/Security, Travel & affiliated Costs, Pollution, Security risks (terrorists), Natural Disasters, Military Coups & Political instability, Covid19. (Plantation) On PIR, the beach has gone through shifts of sand beaches – the causeway could have had a hand in it. For the staff – roster times are to be strictly followed, for the overall welfare of the staff and especially if they are married and other half is not on PIR. 12 days on, 3 days off; 18 days on, 4 days off. Leave days of staff are dependent on occupancy rates, if PIR is full, staff will remain on island longer and take days off later. (Plantation_Staff_FG) Most of the villagers are employed in hotels therefore it is a challenge to find people to do community work. (Solevu_Village_FG) There are incidents too, where [the] village headman call out for village clean ups etc, but the turnout is very low, because majority are out at work. That's what's happening here now. This is a challenge I am facing now. Majority of our community members are hotel workers, some drop out from their early senior years of high school, opting to work. We don't have many who are civil servants or work in other sectors. I am always encouraging the current students and parents to get their children to work in other sectors, so that they become nurses, doctors and other professions. (Solevu_Village) GEDSI– toilets for pregnant women etc. Not inhouse, guests rooms only. Baby changing tables only in Women's toilets although men are using these. Need them in men's too as western men take on caregiving as well. Plantation Climate change\hygiene and sanitation challenges in extreme weather The only concern is when water is rationed in our staff village – due to high occupancy and water level is not able to accommodate for everyone; guests and staff alike. (Castaway_Staff_FG) No. Just the rationing to the staff quarters, but as already discussed, these water closures don't really affect us, because it's done during working hours and only taking a shower and laundry is restricted. Water to the toilets is not. (Malolo_Staff_FG & Plantation) Our water supply – it's inconsistent because the boreholes are solar powered. When there is no water; first is we have to be ready to accept that issue and everything associated with no water, especially for us women. We really need to manage our water usage wisely and that means, only washing the necessary clothing/linen, with the rest being done later, when the supply is better. Often times, we'll have to go to other boreholes in the village, means leaving the home to go and do laundry for a few hours. There's about 3 boreholes in the village, so we just go to the ones close to our houses. But even this is a hassle, having to leave our home, the carry to and from the boreholes. And in this day and age, this shouldn't be happening, in fact things should be much easier – no issues with water. And especially as we age. (Solevu Village_Female_FG)	There was constant supervision of women's appearance and actions. Community children became aware of material differences in lifestyle between themselves and tourist children. There was strong awareness of negative environmental impacts.

	Have there been any challenges / problems with hygiene for people with a disability in weather extremes? Yes, especially when our water supply is low – but they've been able to have a way around that. (Solevu Village_Female_FG) Yes during dry periods when there is shortage of water so cleaning is secondary to drinking/cooking needs. Climate change\Adaptation, response\Community procedures to maintain WASH services during extreme events - Yes. We use the community hall – sometimes we just go and take shelter in our neighbours' houses. We don't have a set evacuation plan per se to tell us what to do, where to go etc. We just judge the condition of the weather and evacuate to either the village hall or neighbour's house accordingly. I really think there should be one – for me, sometimes I think of coming to the Hall, but then I think of the waves and how it can come right up to the Hall, so I think twice about coming here. (Solevu Village_Female_FG) Youth issues – Malolo Island. Unemployed youths in the village are estimated at 20% [of population]. A key issue is that most of the youths just look for quick money. Some left the resort to go work on the Survivor series. That lasted only 7 months, after filming, these youths now want to return to their work with the Resort. (Solevu Village_Female_FG)	
Disability	No disability showers and toilets, no handles in bathrooms, toilets or ramp access to rooms and common areas. Staff carry disabled staff and assist them when needed. For staff? No special facilities for staff. (Castaway) No, we don't. We don't get many disabled or wheelchair bound guests. However, some wheelchair bound guests bring their own toilet seats with them. Staff/guests? There are no disabled specific toilets for staff members. (Castaway_Staff_FG) Toilets are not fully designed for disabilities so not ideal for people with disability in terms of mobility. (Lomani) Disability access for guests? Yes For staff? No (Malolo) Yes, and it's only up at the main restaurant. There's none down here in this public area. Staff/guests? There are no disabled specific toilets for staff members. (Malolo_Staff_FG) Our community toilets are currently not disabled friendly. We need to improve that, because we have members who are wheel chair bound, some use crutches, we also need to have hand rails in the toilets especially to help those elderly members. Community – (Solevu Village_Female_FG) Yes no hand-rails and door cannot allow wheelchairs through (Solevu Village_Male_FG) Gender separate toilets Yes, in the public area toilets. We have a Community Hall like area. It currently has only one toilet. For us women, we prefer to head back to our rooms, rather than use the one attached to the Hall. It is mainly used by the men. It would be great if 2 toilet stalls specifically for women to be built and for the men, for maybe 2 urinals and 1 toilet stalls. (Castaway_Staff_FG) Guest lounge shower and toilet, male and female toilets by the Restaurant and at the kitchen for staff. (Lomani) For guests? 4 gender specific toilets (2 – Male, 2 Female) For staff? Ladies block – 3 bathrooms and 3 toilets, Men's block 6 bathrooms and 6 toilets due to more men in the staff roll. More ladies travel daily from the village. Staff that are accommodated in the staff quarters are from the mainland. Village staff have one bathroom and 1 toilet for each gender. (Malolo)	There were limited to no WASH facilities for guests with a disability and none for staff with a disability in hotels. There were no WASH facilities for members of communities with a disability. There was provision for disposal of hygiene materials for MHM but no staff training or provision of support for women.

	For us at the House-keeping department, we have briefings every day before our shift. We're reminded to constantly use hand sanitizers, washing of hands. Sometimes we inform the meeting that we get allergic reaction to some chemicals, we are then reminded to use the gloves, which are part of our kit. Personally, when I wear gloves, it slows down my work. (Castaway_Staff_FG) Of course, MIR has the most women as managers and supervisors. There are just 4 male managers, whereas the rest are made up of women, a total of 6 altogether. There are another 6 women supervisors. We also have a women's club in the Staff quarters and when we do have meetings, we just stress the importance of hygiene, taking care of our bathrooms and toilets, we have a roster on cleaning these facilities etc. They do listen to us, take our suggestions on board and share it with to top level executives. (Malolo_Staff_FG) Yes, we're free to do so. We also have our own women's group meetings, that's another forum where we bring these issues up. In the village meetings, a lot of times the men accept and go with what we the women recommend. I for one speaks out a lot – especially in areas where I see needs improvements. But you know, sometimes the men don't accept – you know how they are. We women usually have a broader few and some men can't accept that. And lots of times what we women suggest are also implemented. So it's good. Sometimes men don't accept what we offer, because their point of view is not as broad as ours – the women. (Solevu Village_Female_FG)	
LGBQI inclusiveness	Are there gender diverse toilets? No If not, how do you decide which facilities to use? They just go into whichever one they prefer. (Castaway_Staff_FG)	Same response for all hotels/resorts interviewed.
5.Sanitation *Sanitation access in resorts*	1 toilet: 8 staff, the 80 staff that currently live in the staff quarters are not all there at any one time, so are at work, some off island. So there's never a case where there's any shortage of toilet/bathroom facilities. (Malolo_Staff_FG) 1 toilet per 2 guests; 1 toilet per 11 staff (Plantation) Cleaners maintain and keep records of cleaning through the resort. They undergo training on chemical preparation, to use the correct proportion. Cleanliness standards are a priority throughout the resort. The housekeeping department also does spot checks in guest areas, toilets and bathrooms throughout the day. (Plantation) The village staff (who travel daily from their homes in the villages) have their own toilets and showers; 3 toilets (2F/1M), 1 shower for males. Women use the shower up at the staff quarters. Another shower room is being constructed for the females in their change room. (Malolo Staff_FG) What would you recommend to improve sanitation in the resort? Housing Committees for Staff Quarters to raise awareness and conduct training on sanitation. There is also a training gap in terms of sanitation to avoid issues of toilet blockage caused by improper disposal of pad or flushing of materials that cause blockage in the system, etc. Awareness gap identified in awareness of menstrual health and hygiene management. (Plantation_Staff_FG)	There is a higher ratio of toilets for guests (1:2) than for staff (1:11). Guests were not interviewed, so views are not represented. Housekeeping and cleaning staff are trained in the proper use of chemicals to maintain the cleanliness of sanitation facilities. Access to toilets and showering facilities are generally considered adequate by staff (both men and women), and water is always available for flushing, washing and handwashing. Some training and awareness raising is needed to improve understanding of how to properly use toilets and dispose of menstrual hygiene products to prevent blockages. Nappy changing facilities are available in Castaway and Plantation resorts, not Malolo (which is an adult only resort). Some resorts noted that baby change tables are in women's toilets and that there is room to

	No inhouse guests rooms only Baby changing tables only in Women's toilets although men are using these. Need them in men's too as western men take on caregiving as well. (Plantation)	adjust this, noting 'western men take on caregiving' roles.
Sanitation access in the village	The number of people that look after toilets and bathrooms, checks carried out and the resources of maintaining proper sanitation at the resorts, greatly differ with that in the village. (SolevuVillage_M_FGD) The village nurse conducts checks every two months and checks include toilets, rubbish disposal areas, bathrooms and outlets for waste water plus household compound. There also exists a Health Centre, nurse and doctor on the island and service is provided from Mon-Friday 9am – 2pm and 2-4pm. (SolevuVillage_M_FGD) Community hall How many are available for how many community members? 2 male and 2 female (SolevuVillage_Female_FGD) The sanitation in our homes are up to us individuals – in the community, we have the rai koro committee. (SolevuVillage_Female_FGD) Has the participant changed their sanitation practices? If not, why not? Yes mainly from my work knowledge, I've implemented this in my home. Other members who work in the other areas of a resort operation also use what they've learned from work – those in landscaping etc. It's helped beautify our village. (SolevuVillage_Female_FGD) Has sanitation access in the village changed over time? Definitely, no more pit toilets – majority have flush, with a few water seal (Malolo_Staff_FG)	Sanitation access is household responsibility, and hygiene is variable. There are regular health checks by the village nurse, including of toilets, bathrooms and wastewater disposal Solevu village households all have access to flush or water seal toilets, which is an improvement on the past when there were pit latrines. There is also a community hall with separate male and female toilet facilities, though these are not disability/elderly accessible. Household toilets are an individual/ family responsibility, whereas the community hall toilets are managed by the 'rai koro' committee. Both male and female respondents did not think there were any safety or security issues surrounding sanitation access to community toilets. However, the toilets were not accessible by disabled community members. There is transference of knowledge from resort practices to the village, for example hygienic toilet maintenance/ cleaning and landscaping/ gardening.
Sanitation through weather extremes	Have there been any challenges / problems with sanitation in weather extremes? Yes during dry periods when there is shortage of water so cleaning is secondary to drinking/cooking needs (SolevuVillage_Male_FGD) Yes we prioritize what we wash for laundry and have to be very wise about the water usage. Saving water for drinking is paramount. (SolevuVillage_Female_FGD)	Dry conditions/drought affect household WASH, particularly limiting water for toilet flushing and laundry, and prioritising water for drinking and cooking.
GEDSI accessible sanitation	Are there gender diverse toilets? No If not, how do you decide which facilities to use? They just go into whichever one they prefer. (Castaway_Staff_FG) No disability showers and toilets, no handles in bathrooms, toilets or ramp access to rooms and common areas. Staff carry disabled staff and assist them when needed. For staff? No special facilities for staff. Castaway	In resorts public toilets are either female or male, and guests can choose where they prefer to go (i.e. there are not specific gender neutral/ diverse toilets). This is the same across all three resorts studied.

	Toilets are not fully designed for disabilities so not ideal for people with disability in terms of mobility. Lomani Are there any access issues for people with a disability, children, elderly using the community toilets? Yes no hand-rails and door cannot allow wheelchairs through (SolevuVillage_M_FG) Our community toilets are currently not disabled friendly. We need to improve that, because we have members who are wheel chair bound, some use crutches, we also need to have hand rails in the toilets especially to help those elderly members. (SolevuVillage_Female_FG)	There are not specific design features for people with disabilities or the elderly to access toilet facilities in resorts, and in some cases staff carry disabled guests when they need it. Resorts reported not having any people with disabilities on staff. Sanitation access for disabled and elderly people is not addressed in the village, which was an issue because there are some elderly and people using wheelchairs in the village.
Menstrual hygiene	Are there facilities to obtain and dispose of menstrual hygiene items? Yes. (Plantation) We have a company who is contracted to take care of [MHM]. So they bring their own bins and their personnel comes over like maybe once a month to service these bins. (Castaway_Staff_FG) This is outsourced to Rentokil, who come on island to service the bins and also do pest controls [and at Malolo]. Lomani Yes, in our individual homes and the women's toilets in the Hall. (Solevu Village_Female_FG) The village nurse conducts checks every two months and checks include toilets, rubbish disposal areas, bathrooms and outlets for waste water plus household compound. There also exists a Health Centre, nurse and doctor on the island and service is provided from Mon-Friday 9am – 2pm and 2-4pm. (Solevu Village_Male_FG) Sanitary bins that belong to Flick Hygiene services. In our quarters, we have our bins in the toilets. (Castaway_Staff_FG) Yes, we do. Flick Hygiene services is contracted to place their MHM bins in our public area toilets and they come over to the island once a month to replace the filled bins. (Castaway_Staff_FG) Yes bins provided by Flicks who also spray the resort premises. (Malolo_Staff_FG) Sanitary bins that belong to Rentokil Hygiene services. (Plantation_Staff_FG)	Resorts provide bins for disposal of menstrual hygiene materials in the female toilets, with some (e.g. Malolo) using a Rentokil bin hire service. No issues with disposal of menstrual hygiene products were raised by community respondents.
Wastewater	We have a big WWT Waste Water Treatment Plant that is remoted managed from New Zealand who oversees it treatments systems, air displacements, preventative risks of pollution equipments and operations. Treated water is recycled into the back of the island nursery and gardens in specific areas of the resort and island. (Plantation) There are 26 collection chambers all around the resort (rooms, public areas, kitchens, restaurants, bars, beach shed and the staff village) to collect waste and transfer these to the main which is then pumped to the wastewater treatment plant at Valase. Clean treated wastewater is discharged to the forest area/water trees. There are also plans to use this water back at the Resort to flush toilets and water plants/gardens. However, this requires more filters and relevant budget, because it will be a costly activity, especially when having to purchase new pipes. The sludge is collected in a drying bed, mixed with soil and used for compost and plant fertilizer. (Castaway) [Sewage goes to the] sewage treatment plant – everything is treated there. (Malolo)	The resort wastewater treatment plants (WWTPs) are well managed systems, with some being managed both remotely and by staff engineers. Staff engineers demonstrated a good knowledge of the treatment processes. Treated effluent is used to water either gardens or the local forest. Solids are treated in drying beds then dried mixed with soil and used as compost / fertiliser. Wastewater treatment and disposal practices in the village are unclear.

	Where does the wastewater from the homes go? To the gardens and soil (SolevuVillage Male FG)	
6.Hygiene in hotels *Hygiene challenges*	The only concern is when water is rationed in our staff village – due to high occupancy and water level is not able to accommodate for everyone; guests and staff alike. (Castaway Staff_FG) [Do you have Hygiene challenges"?] Yes - however Grounds and Public Attendants promptly attend to it. (Castaway Staff_FG) No. (Malolo) No, unless there are damages to sewerage systems or tanks (Plantation_Staff_FG) When there is no water; first is we have to be ready to accept that issue and everything associated with no water, esp for us women. We really need to manage our water usage wisely and that means, only washing the necessary clothing/linen, with the rest being done later, when the supply is better. Yes we prioritize what we wash for laundry and have to be very wise about the water usage. Saving water for drinking is paramount. (Solevu_Village (F)_FG) Have there been any challenges / problems with hygiene for people with a disability in weather extremes? Not sure – because those with disabilities do not live alone, there's always someone around to assist them. (Solevu_Village (F)_FG) Humidity and heat during the hot periods affect hygiene and during water problems one has to make the choice between drinking and washing/bathing. They have the option of bathing in the sea though (Solevu_Village (M)_FG) Yes during dry periods when there is shortage of water so cleaning is secondary to drinking/cooking needs. (Solevu_Village(M)_FG)	Staff at the resorts find rationing of water a challenge with regards to their hygiene. Water rationing usually occurs during the dry spells and there is high occupancy at the resorts. In the communities, power supply to pump water from the source – boreholes, is a major challenge, because they rely on solar panels. Often, there is not enough sunlight to charge the batteries, so pressure is low. When this happens, the women have to leave their homes and go to nearby boreholes around the village to do laundry. For persons living with disabilities in the communities, there is no perceived issue, because these persons always have someone around to assist them. However, this community assistance system relies on people being present to assist and does not promote the independent mobility and action of people with a disability. When water pressure is low during the extreme dry seasons, community members compromise showers to prioritise drinking and cooking needs. They often use the sea for their personal hygiene.
Hygiene training	We are not sure, as we don't work in the kitchen. (Castaway_Staff_FG) [Hygiene] Trainings happened in November and December 2021. [There is] on the job training amongst different departments. (Castaway Staff_FG) Rentokil services staff bathrooms/toilets as well as guests. (Malolo) Prior to the resort opening all management underwent vigorous Care Fiji Compliance training which they then passed down through training in their various departments. This training was conducted by the Min of Commerce, Trade, Tourism & Transport (MCTTT) together with Tourism Fiji and Min of Health and Medical Services (MHMS)- this was a requirement before opening on 1Apr, all resorts and hotels had to undergo this. We had the savasava (clean) program - during the height of the pandemic and we were only open to locals. These are basic things such as how to wash your hands thoroughly, using soap, sanitizer etc. Plantation	Hygiene training in the resorts for all departments was heightened and a priority during COVID19 outbreaks. These trainings were conducted by the Ministry of Health and Tourism Fiji, as a requirement for re-opening.

Hygiene differences: community vs resort	With me, washing of hands is very important. My daughter goes to school and she comes back she shares what she learns. We have sanitizers too at home, especially for my daughter who is learning about all of this at school. I also place the hand sanitizer bottle in the kitchen, because that's where everyone comes to. I actually have 2 bottles, one on the table, the other on the counter. Whenever someone comes into the kitchen, automatically, they just start pressing the bottle to sanitize their hands. It has always been, but now more emphasized since my daughter's school is one of those WASH schools and also habit at work and now especially with Covid 19. (Castaway_Staff_FG) Yes changed with those working in the resorts taking the practices at work to their homes. (Castaway_Staff_FG) [Yes, it] has changed with staff from villages being trained at the resort on food handling, hygiene practices, etc and set standards in village. (Malolo) During and after the pandemic, in my household, the handwashing has been really emphasized and my household members are on alert about washing of hands. We have soap, liquid soap and even sanitizers, all bought from the supermarket. I also see this in other homes in the village. Covid19 had a huge role in the changing of the villagers' mind set. Pre Covid, it really was something just took for granted, but since the outbreak of C19, it really has made people constantly washing their hands. (Castaway_Staff_FG) I think so, because kids learn this in school, all the COVID notices have made community members more aware of the need to be clean. (Malolo_Staff_FG) Sometimes people don't really care about personal hygiene especially if they stay home and not attend an event, travel, etc. It has changed with the influence of staff working in the resorts and taking these back home as well as when serving visitors who visit the village to buy from the market or tour the village and school. (Plantation_Staff_FG) WASH practices from the workplace has worked for some while not for others as during day-offs staff have commitments/events to attend (away from the village) or go shopping to mainland and spend more time out of the village then in the village. (Solevu Village) 5. For me as a former housekeeper in the hotels, whatever I do at work, I do it in my home. The chemicals are not the same, but whatever I can afford and find, I buy and use it, especially in toilets. I buy the air fresheners etc. Solevu_Village_FG At resort workers are paid to maintain proper hygiene practices as opposed to the village setting where it is voluntary and dependent on individuals. Yes it has changed over time due to the influence of those who have worked or currently working in the hotels. (Solevu_Village_FG)	Hygiene practices in the workplace have influenced staff members to do the same in their households, although not as rigorously as when they are at work. In some homes, the children are the monitors of hygiene, because their schools are part of the WASH in Schools program. This makes hygiene practices at home more pervasive .
Hygiene practices in the communities	Good examples are those working in the housekeeping department, their homes are disorganised and not cleaned. You would expect their homes to be the tidiest, but it's the opposite. (Solevu Village) There's a special committee in the village that oversees the general upkeep of our living spaces. So committee members go around every household and record their observations, this is called 'rai koro', loosely translated, village watch. I used to be a member. At these meetings, the Committee sometimes points out areas of the village that need improvement in the overall upkeep of the area, including homes. I share my experiences and knowledge during those meetings. It's a good thing, because it's important that we live in a clean space. Some tips I share include; sunning out of beddings esp – say once a week, when sun's out. (Solevu Village)	Hygiene practices in communities are part of everyday life. Social structures within the communities have created a committee in charge of the hygiene and sanitation. Issues found by these committees are addressed in village meetings and families are strongly urged to address their hygiene shortfalls. Respondents also feel there needs to be constant training in up-to-date practices, so

	Other ladies who are working in the hotels too do the same in their homes and share at the Village cleanliness meetings. It has really helped those who have never worked in hotels learn new things. Overall, whatever we share, has really made great changes in the various homes. The rai koro committee consists of 1 woman from each sub clan or tokatoka in the iTaukei language. There are 10 sub clans altogether in Solevu, so 10 ladies in that committee. So if there's some issues with a tokatoka, it's the responsibility of their rep to take it back and inform its members on the issue and what they need/should do about it. For example, this household doesn't have a proper incinerator, so the tokatoka has to collectively get one done. Those are just some examples. (Solevu Village_FG) [We] need more awareness and training. Some workers do bring home WASH at work practices. Level of education is also a factor to consider in the adoption and filtering down of WASH practices to the household. On the other hand workers maybe too tired to implement these practices at home and sometimes have commitments outside the resort which then causes their absence from the village/home. (Solevu Village_FG)	communities are up to par with whatever the Ministry of Health is advocating.
7.Climate change *Key impacts and concerns relating to the environment and climate change*	Broken coral is very evident when one goes snorkelling around here, close to the beach. This is from the strong currents associated with weather patterns and changes. (Castaway) My biggest concern while on my term here is the weather, if it doesn't change, it can lead to other major events like cyclones. Not many resorts can survive another blow like that after COVID. This can also lead to guests changing destinations, highly likely to lose our market if we get more extreme weather – too wet or too dry/hot. (Lomani) One of our greatest concerns on the shifting of the beach profiles is – our beachfront has more rocks than sand now. So the sandy beachfront we used to have, are now short (distance from accommodation verandas to the water edge), there are more rocks by the water's edge now. (Malolo Staff FG) Yes, from the time I've been working out on island resorts, the changing weather patterns also change the overall outlook of a place. E.g shifting of sands on the beach front. (Plantation Staff FG)) And all of the islands around the Pacific are experiencing far higher tides than the rest of the world. (Plantation & Lomani) Climate change concerns include coral bleaching (2005), expanded coral planting, water temperatures drop between 27-29, sea level rise push up sand, extremely hot or cold weather conditions. After cyclones it takes longer to recover. (Castaway Staff_FG) No trees/forests on the hills/mountains, when water levels increase water comes into the village and erode the beachfront. At times weather can be too hot and burning practices when farming are affecting the health of soil and crops in the plantations. (Solevu_Village)	Respondents in the Mamanucas identified a range of environmental changes and concerns, many of which are likely linked to climate change impacts. The key impacts are: Damage to coral reefs from: bleaching events; increased wave action from boats; increased wave action from currents and cyclones Reduced fish size and abundance linked to coral damage Changing beach shape and sand deposits Increasing high tides with increasing occurrence of and risk of inundation of resort buildings, and, in villages, eroding beachfronts. Climatic changes that have been noted include: Greater intensity of rainfall leading to localised flooding (e.g. in Solevu village) Increased cyclone frequency and intensity Changing weather patterns in terms of hot and cold conditions.
Adaptation responses to climate change	PIR is now in danger of the 300 (accommodation room #s) blocks, at very high tides, water comes into that block, this never happened before. Looking at losing 30-40 rooms to high sea level rise and that's happening now. It's accelerating – the height of the waves. (Plantation + Lomani) They currently conduct some environment activities such as tree planting to protect against soil erosion and protect the foreshore area. These include coconut trees, 'tavola' and 'dilo' trees. The Resort also does coral planting and giant clam farming. There are plans to plant 'vatia' grass and mangroves however there are	Resorts are already adapting to climate impacts from higher tides, rising sea levels through a range of infrastructure and conservation responses, and are adapting their planning and expansion plans to

	clashing views with maintaining the 'view' of the sea/ocean. However, there's usually resistance from the Reservations team, as these trees would obstruct the room's undisrupted view of the beach front/ ocean. (Castaway) Have built a seawall on the South beach, to keep in the sand. No natural beach on one side of the island. We are lucky to have a desalinisation plant which provides all our needs. (Castaway) The resort does coral planting, clean-ups, crown of thorns clean-up, turtle breeding, etc. Environment activities are also organized for hosts and guests. (Castaway_Staff FG) Regarding water here at Lomani, we have Plantation Island Resort (PIR) that supplies us (Lomani) with desal water - so there is no problem with water. (Lomani) Yes especially of dry land during droughts, land slides, strong currents in the sea, trees and plants die due to the heat. (Solevu Village_Male_FG) Yes through the planting of trees in the forests and along the seashore to avoid erosion of beaches. Even Though we're planting mangroves, it hasn't stopped the waves from washing up further inland. We have sought assistance from the government for a seawall and also to do something with the dry river bed - maybe dig it up properly so it doesn't flood houses when it fills up during heavy rains. (Solevu Village)	accommodate a likely worsening of those impacts. Large resorts are managing sophisticated conservation programs, many of which involve guests and partnerships with external researchers, government and NGOs. Solevu Village is adapting to coastal erosion and flooding risk in ways they can (e.g. mangrove planting) and have requested government support for larger initiatives (e.g. seawall construction, and river deepening).
Emergency preparedness	Yes evacuation plans and procedures in place in Department's notice boards, outside the Nurse's clinic and in the guest rooms. A siren is also available at the main office. (Castaway staff FG) We have our own emergency contingencies, apparels, evacuations, sustainable post natural disasters requirements including foods, supply, water, etc. We carry storage supplies for a couple of weeks leading to expecting landing dates of natural disasters, etc (Plantation) Yes. The community hall also acts as the evacuation centre for cyclones and other natural disasters. (Solevu Village_Male_FG)	Resorts mostly have evacuation and emergency response plans in place, and aim to be self-reliant.
8. COVID-19	All COVID travel testing requirements have now been lifted although all visitors over 16 years old are required to be vaccinated. Just few COVID-19 cases for some guests and staff. Since the Resort opened on 1st Dec, they had their first COVID-19 case on 20th Dec, 40+ families tested positive were isolated for 10 days. After two days they improved with little symptoms but had to complete the 10 days of isolation. For those fully vaccinated, nurse found they had less severe complications. Guests were isolated in their rooms while staff had an isolation facility also on the island. (Castaway)	Culture of adaptation in tourism industry / communities – people now operating with higher level of hygiene / hygiene awareness
9. Tourism and Value Proposition *Success factors of tourism in the Mamanucas*	The unique characteristics that draw tourists to the Mamanucas Islands, Sand, Beach, Activities, Customs, Services, Safety" (Plantation Staff FG) Fiji offers 3 key ingredients that are 90% of the primaries for a holiday Airline – economical and great value for money, great schedules for all demographics & seamless interconnectivity Safe & clean destination- non terrorist, sustainable, care management, freedom to do what wants to access as shops, museums, beaches, villages, activities, etc Services – foods, bars, restaurants, transfers, activities, meetings, IT. Plantation What makes hotels successful High level of returnees with relationships created with staff over time. Friendly service, Free Kids Club, Good food, Beautiful environment and Diving. Able to visit many neighbouring island resorts. Safe environment for	Hotel workers and managers believe the following factors make hotels in the Mamanucas attractive: The people and friendly staff The quality of the local environment being safe and clean (beaches, ocean etc.) Weather Facilities and service offered The location (easy access to hotel and surrounding attractions)

	elderly and children. We also have excellent access to the resort i.e. 3 times a day e.g. Sea Fiji, South Seas Services and Mamanuca Express. Castaway Services and People – Family both guests and employees (Plantation_Staff FG) The staff, the management – it's just how they manage the business financially especially. The welfare of staff is well taken care off by the staff – so there's low staff turnover. (Malolo_Staff_FG)	
Key challenges and limits to tourism development	Losing of experienced and skilled staff going overseas, new graduates with little industry experience (Castaway_Staff_FG) Environment challenges, damages to reef, staffing (loss to NEC, etc), changes to leadership structure. Malolo Water (can't drink water from tap – high salination in certain places) (Plantation_Staff_FG) Support to all WASH practices at the Resort especially in the purchase of equipment and training for staff. These requires budget. The Resorts cashflow process includes consideration for guest experiences, mortgage resort needs to pay and infrastructure, amongst other considerations. The priority is paying of mortgage and key things up the chain. Plantation Climate change, Lack of skilled industry staff, Poor staff knowledge of the industry, Dying reefs, lack of EIA for new developers including FreeSoul developments, lack of Tourism cohesion amongst operators and owners. Taxes. Plantation No encouraging tax concessions on itemised improvements including: -Capex for developments & improvements, tax concessions for employment opportunities, incentives for partner development programs, Benefits Sharing within Localisation Industry & Non- Industry Partners, Landowning Leadership development, Cooperatives supplies, Skills shortage and unregulated Environmental undertakings in some forms. (Plantation_Staff_FG) We will spend too much time wanting to be like those guests, that we lose our unique features that sets us apart from them – the very thing they come over to Fiji for. Castaway_Staff_FG Most of the villagers are employed in hotels therefore it is a challenge to find people to do community work. Solevu Village There are incidences too, where I as village headman call out for village clean ups etc, but the turnout is very low, because majority are out at work. That's what's happening here now. This is a challenge I am facing now. Majority of our community members are hotel workers, some drop out from their early senior years of high school, opting to work. We don't have many who are civil servants or work in other sectors. Solevu Village	Respondents identified several key challenges for tourism in the Mamanucas, limiting development. These include the loss of experienced and qualified workers to overseas opportunities, the impacts of climate change and several respondents also highlighted WASH specific challenges, including the quality of the tap water and insufficient resources being spent on WASH practices. Tourism causes a range of negative impacts, including: environmental challenges linked to climate change pollution reef degradation due to visitation increased crime commodification of culture impacts on village life
CSR and the positive impact hotels have on WASH in communities	MES was originally funded by Castaway Island Resort before it invited other resorts in the Mamanuca Group of islands to be part of the Society. MES now represents the Mamanuca resorts to the local communities. Apart from working with the resorts, we are also the MES reps to the Communities. This is basically carrying out environmental awareness to the villagers when the need arises. Castaway When a guest wishes to fund an environment conservation etc project in any of the villages, we are the liaising party between the funder and the village. Castaway Mamanuca Environment Clubs have been set up in 4 primary schools and 3 pre-schools where 1 hour programs are conducted weekly (30mins theory and 30mins practical) focusing on climate change, land based sources of pollution, etc Castaway Yes. Work with Solevu on Village Projects- new bore hole, plumbing, Meeting Hall, restrooms, school. Guests also bring gifts for children at the school e.g books, pens, rulers, pencils, erasers, stationery, backpacks. (Castaway_RM)	Hotels and resorts engage in a wide range of CSR initiatives, covering: environmental conservation and sustainability programmes (implemented via MES), social initiatives with a particular focus on education, funding and supporting kindergarten and schools WASH specific initiatives

	Yes via sponsorship of the Rugby 7s at Yanuya. Support to villages and Ratu Lalabalavu Memorial School (gate, water, etc). (Castaway_Staff_FG) Mangrove & coral planting are some activities of the Kids Club. (Malolo_Staff_FG) For any community requests, the request will be channelled through the Mataqali Ketenamasi (land owning unit) of Yaro village. The clan committee to Mr. Tony Whitton who will consider on a case-by-case basis. (Malolo_Staff_FG) Plan [to improve Inclusive WASH implementation within the broader destination] include Housekeeping clean-up all toilets next week (Plantation_Staff_FG) Assistance from neighbouring resorts to Solevu village. Six Sense assistance: They've helped build our small jetty, water tanks to some families. (Solevu Village)	
Value proposition	[Our] vision is more visitors and tourism continues to grow, more staff to cater to the increasing demand (Castaway_Staff_FG) [Culture is involved] In the service delivered, entertainment, hotel infrastructure and design, utensils used, food and drinks, etc all reflect our culture, beliefs and practices. (Malolo) Sustainability is the word of the future – if serious we can provide the most sustainable holidays, destination, tourists, academia, etc at the islands of Fiji. (Plantation) How vision can be achieved We need to take care of the environment first – because that's what's the tourists are here for. Castaway_Staff_FG Keep our cultures intact, the Bula spirit and our unique hospitality in order to maintain the business of tourism (Castaway_Staff_FG)	When asked about what success looks like for tourism in the Mamanucas, respondents' vision revolved around growing visitor numbers and spending, whereinsome also highlighted the important role played by sustainability. A GEDSI WASH-at-Work program in hotels and communities can help address some of the existing limitations to development, address negative impacts of tourism and can thus contribute to a thriving tourism industry the Mamanucas, especially if visitor numbers are to grow.

5 Discussion

In order to understand whether a GEDSI WASH-at-Work program may effectively address the WASH requirements through climate impacts in hotels operating in, and the communities supporting, Fiji's tourism sector, it is important to understand what their needs, concerns and interests are, recognise existing WASH practices, and assess the tools required to enhance them. The formative research findings analysed here form the basis from which to understand current GESDI WASH-at-Work practices and how these might be improved through GEDSI WASH-at-Work programs in the Mamanuca Islands, particularly in relation to climate change resilience and disaster risk reduction.

5.1 Water and Water Use in the Mamanucas

The Mamanuca Islands lie on the western side of Fiji's biggest island, Viti Levu. There are an estimated twenty volcanic archipelago islands which belong to the group. The Mamanucas' geographical location places them on the drier side of Viti Levu, hence rainfall is scarce.

All hotels in the Mamanuca group source their water from the sea and each have their own desalination plants. In the past, they have had to cart water from the mainland to fill their water tanks. Rainwater catchment was not relied upon, as it rarely rains over the island group. Over the years, with improved sophisticated technology and investment from property owners, the resorts have undertaken a major overhaul of their desalination processing plants. Their investments have enabled a steady supply of water that is sufficient for resort and staff needs. Whilst water from desalination plants is safe to consume, for guests' safety, bottled water is offered to them upon arrival. Guests can then refill these bottles from refilling stations located around the resort property.

Staff living in the quarters use the same water source as the resort guests and staff. There are water tanks installed in the living vicinities, as back up, when pressure is low – mainly when it is tourism peak seasons. Staff members new to the Mamanuca group report a short delay in adapting to drinking desalinated water.

One of the properties has a dam, which used to be the main water source. However, the dam is now used as a backup source, as the property has increased its room capacity and is unable to supply its current needs. The dam water, although always on standby, is mainly used to supply the staff quarters, when they face water issues.

Unlike the resorts, the communities in the Mamanuca group rely on boreholes and rain for water. In the communities visited, all houses had their own water tanks. Rainwater collected in the water tanks is used for drinking, whist the supply from the boreholes is for cooking, showering, toilet and laundry. Some homes have two water tanks, with one specifically for the toilets. When the water level in the tanks and borehole supply is low, community leaders reach out to the government administrator on the

mainland to cart water over to the islands. These are carried over via barges. Although having water supplied to their homes has eased over the years, the elders desperately want things to change for the better; specifically with regards to power supply for the boreholes, so water is consistently supplied throughout the week. Currently, water from the boreholes is pumped into the main holding tanks once a week from which each house gets its supply. When supply runs out before the next main fill, individual families carry their generators to the smaller boreholes around the village to pump water into their individual water systems. The elders would like to see a more reliable source, as it is currently solar powered.

The main risks to the resorts' water source are the leakages and corrosion of ageing infrastructure, and the initial lack of consultation with water engineers, which is now causing planning and repair difficulties. The risk of water contamination was also identified; however, it is not a key concern for those overseeing the production and supply of water on the resort properties.

In the communities, the changing weather patterns are a great risk, because they result in low pressure and low supply of water from boreholes and rain alike. In some instances, after major weather events such as cyclones, salt water seeps into their main water sources.

Resorts in the Mamanucas have been able to operate in this water scarce environment through the adoption of resource osmosis desalination water treatment systems which rely on saltwater. Some supplement this with rainwater collection. As such, they are less affected by changes to wet and dry seasons, but must also operate and maintain costly water treatment systems, engage engineers and ensure discharge of highly saline brine does not affect the surrounding fragile marine environments. Reverse osmosis produces water of drinking water quality, and most resorts regularly test quality parameters. Reverse osmosis units require high energy inputs, which the resorts meet through diesel power generators, thereby adding to the carbon footprint of resorts.

In the hotels, research results indicate that water is used in every department of the hotel operations in the Mamanuca group; accommodation/rooms, kitchen, restaurants, bars, the spas, activities areas, engineering, laundry, landscaping and general areas, and in the staff living quarters.

Water usage volumes differ in every department, but they are a vital component to keeping all these areas hygienically clean and safe. In the kitchen and bars especially, water is used for cleaning and mostly after handling and or touching a single item to avoid any contamination, which would not be in the best interest of any resort. The landscaping department uses water for its flower and vegetable gardens, keeping the lawn green through sprinklers and for the general cleaning of the guttering, footpaths and walkways. In the general areas, such as lobbies, water is used to mop the floors, and to wipe down posts and seating areas.

Guests use water at the resorts in their rooms for hygiene and grooming purposes. There is a higher usage level when they take advantage of hotel facilities and services such as swimming pools and laundry.

As with guests at their respective resorts, staff members living on-site and in staff quarters use water for their everyday hydration, basic hygiene and sanitation needs. This is in addition to laundry and general cleaning of their living spaces. Water is also used during staff social events, when it is one of the main ingredients for kava drinking.

Climate change, hygiene and sanitation challenges in extreme weather means that water is rationed in the staff villages near some of the resorts when resort occupancy levels are high and water levels are not able to accommodate everyone. Sanitation is maintained for staff by a constant supply of water to their toilets, but hygiene can be compromised as showering and doing laundry is restricted. Within the community the water supply can be inconsistent due to their boreholes being solar powered. Water is managed by the community in terms of only washing necessities until the supply improves, and saving water for drinking.

The main risks to resort water systems highlighted by resorts are the leakages from the current piping systems, many of which are up to four decades old. Moreover, developments have increased since the initial laying of the pipes, which see buildings directly above critical piping joints. Instances as such create greater issues for engineers when trying to find leakages and repairing them. Additionally, the old piping systems for the most part were poorly planned and are increasingly becoming a costly affair to repair. The chief engineers for two of the properties visited highlighted that engineers were not involved in the planning stages of new building developments, citing this as the main reason for the water pipe system issues.

Another problem increasingly faced by resorts is the pipes currently in use. These copper pipes are corroding due to the salt content in the water. The current practise is to replace with PVC whenever a pipe needs to be changed.

In the communities of the Mamanuca group, water is used in their everyday living. Even though getting sufficient water is a challenge, there is always just enough for cleaning, cooking, drinking, the gardens and personal hygiene and sanitation purposes. Whilst these communities have faced the same water issues since birth, over time, they have adapted their knowledge to see through the very rare days of having no supply at all. One of the communities' biggest concerns is the power supply used to pump water out from their borehole sources. At the time of the research, small solar panels were being used which, according to some community members, are insufficient because the sun's solar energy various from day to day. This, in turn, affects the volume of water being extracted, a lot on some days and not so much on others. Their solution is to get bigger solar panels and battery to store energy or use a big generator. However, both solutions require government assistance, as they are too expensive for these communities.

5.2 Governance and Policy

The data indicated the need for closer collaboration to ensure good governance of WASH between resorts and communities in the Mamanuca group of islands. Stakeholders work in collaboration particularly with the Mamanuca Environmental Society (MES), which was originally funded by Castaway Island Resort and later included other resorts in the Mamanuca groups to form the society. It was noted that resorts could provide more direct liaisons with the communities,, but instead go through the MES who receive funding from other resorts and guests. Whilst there is collaboration with multiple stakeholders such as government and NGOs, this was mostly during the height of the pandemic through the distribution of food rations.

Staff do not seem to be aware of tourism policies and plans, but noted that their general managers would have more knowledge. This highlights the need for increased awareness within the greater tourism workforce. There is a need to ensure messaging and information are sent and received and work is done in partnership with industry stakeholders to ensure effective awareness. Support for Government policies is provided by the tourism sector through the tourism associations and groups who assist where they can either through conservation, rehabilitation efforts, support to infrastructure and charity. In particular, the Fiji Hotel and Tourism Association is working strongly to obtain more policy support and establish structures to enhance sustainable practices. Whilst there is support to 'build back greener', it is important that this be inculcated into policies and legislation for wider acceptance and uptake. There were also minimal responses in regard to government support for corporate social responsibility initiatives in the Mamanucas, therefore, there were recommendations from the hotels for government to consider subsidising costs for transport or accommodation to encourage hotels to give back to the community. The subsidising of transport cost relates to ferry and fuel transfers from the mainland to island resorts which, with recent increases in fuel and the cost of ferry maintenance, is very expensive.

5.3 Culture and Tradition

As noted in Suva and the Coral Coast in Viti Levu, respondents recognised that Fiji's varied cultural beliefs and practices could be leveraged to achieve the country's broader vision for tourism. Cultural beliefs and practices were noted for their capacity to attract visitors, particularly via invitations to Kava drinking ceremonies. Many resorts in the Mamanucas actively promote the unique traditional practices which support and maintain Fiji's cultural diversity.

The practices include the cooking and presentation of traditional Fijian dishes such as lovo and kokoda and the traditional dances known as mekes. The respondents also focused on the ways guests enjoyed the marine environment via diving and fishing on the reef, appreciated the resorts' natural resources, location and authenticity, and were interested in sustainable development. Success in many resorts

was valued by staff as being the high level of repeat visits by guests, to the point of welcoming the next generation from earlier guests' family members.

Of equivalent note however, staff voiced concerns relating to the negative social and environmental impacts of tourism, citing increased prices and crime and cumulative damage to the reef ecosystem as key issues to be addressed.

Employees voiced an elevated level of approval for management where managers recognised and understood staff's familial obligations. Hotel managers' respect for and knowledge of the local culture enabled workplace issues to be resolved sensitively and professionally, particularly in the case of local managers, who have the advantage of identifying culturally-appropriate practices.

A GEDSI WASH-at-Work program that is linked to evidence-based risks from climate change, is engaged in disaster risk management and planning, is generated from the tourism-sector and is supported by government, could enhance knowledge and awareness of effective WASH actions and the necessary hygiene practices during and post-disasters within local communities at the case study resorts and elsewhere in the Mamanucas and Fiji.

5.4 Gender Equity, Disability and Social Inclusion

Respondents identified a range of GEDSI issues as key influences on hotel operations in Fiji's tourism sector. Overall, issues relating to gender equality, particularly in relation to women and girls, were recognised and understood. However, the negative impacts on tourism on family life were articulated as being of concern, particularly for married women who have to leave family members on the main island to live on the resort island for a lengthy period, especially during the high season during which days off are only allocated when there is a low occupancy rate. The requirements of female employees were linked with issues relating to impacts on Fijian culture, i.e. "how we dress, even to our hairstyle, how we speak", as well as the potential impacts on Fijian children of seeing international guests and families enjoying a more relaxed and potentially luxurious lifestyle than that to which the children have access. In terms of hygiene and sanitation, it was noted that many resorts did not have facilities for pregnant women/mothers or provide relevant parenting facilities in male toilets, a lack that reinforces the social expectation that only women care for infants and small children.

Further issues such as pollution, diseases/pandemics and a move away from self-sufficiency through agriculture to tourism as a livelihood, were also articulated and were linked to problematic structural issues such as taxation, fraud, and lack of security personnel in the Mamanucas. Environmental concerns were raised in relation to negative impacts on marine resources and the natural environment, particularly due to the space limitations of the small islands, "There is hardly any space on land".

Within the communities, village heads noted that the shift to employment in the tourism sector meant that it was challenging to find sufficient people at home to assist with the tasks of community maintenance. The tourism sector is perceived by youth to be so immediately enticing that young people drop out of the education system, thereby not availing themselves of education, training and possible employment options in other potentially more lucrative and longer-term rewarding sectors. This concern linked to issues relating to youth that were specific to Malolo Island in that unemployment among youths in the village is estimated at 20% of the population as a number left the resort to work on the Survivor series for 7 months of filming, but now wish to return to their work with the resort.

Youth unemployment can link to research in Fiji, which suggests there has been relatively successful engagement and consultation with youth groups in the formulation of climate and development policies. “This success is reflected in the policies’ regular and attentive mention of the vulnerabilities and capabilities of marginalised populations, and the need for intersectional implementation. But Fijian youth CSOs have stressed that improvements could be made by up-skilling and capacity-building with young people to equip them to better participate in and navigate often exclusionary and jargon-heavy formal policy spaces”. Such success could be managed to effectively engage with youth in the Mamanucas to build capacity and future employability in relation to climate change action in areas such as fundraising, proposal writing and financial management (Plan International 2022, 17 – 18).

Responses to climate change and planning for disaster risk include use of the community hall as the evacuation centre for cyclones and other natural disasters and/or sheltering in neighbours’ houses. Regrettably, there does not seem to be an established, localised emergency evacuation or management plan for the Mamanucas Islands’ communities. Community halls may not be sufficiently sensitive to the WASH needs of women and girls, nor those of people with a disability. For instance, community members identified that the toilets in the community hall / evacuation centre do not have disability or elderly friendly access features.

GEDSI issues arise in the gaps in people's knowledge, in the provision of facilities and in the planning and supply of WASH infrastructure in relation to climate change challenges and disaster risk reduction actions. In not understanding the heterogeneity of tourists and the community, the needs, interests and concerns of members of socially vulnerable groups can be under-estimated or ignored. For example, at one resort there were no disability showers and toilets, no handles in bathrooms, toilets or ramp access to rooms and common areas - staff carry disabled staff and assist them when needed. Overall, there are no special facilities for staff with disabilities. There are gender-separate toilets in the hotels, but not always for staff. Within the workplace and community there are no toilets specifically for gender-diverse staff or guests, "They just go into whichever one they prefer".

Within the community toilets are currently not disabled-friendly, despite residents who are wheelchair bound and some who use crutches. There are no handrails in the toilets to assist the elderly. There is a reliance on family members to assist people with a disability, "those with disabilities do not live alone, there's always someone around to assist them". While the community spirit that shapes reliance on others is to be applauded, a reliance solely on family members could become problematic in disaster situations.

GEDSI is included in employees' meetings in that women are able to speak, they are listened to, and action is taken in relation to their ideas and concerns their workplaces, "they do listen to us, take our suggestions on board and share it with top level executives". Within the community women have their own women's group meetings, in which men usually accept and action what women recommend. Occasionally there is a difference in viewpoint and "sometimes men don't accept what we offer".

Workplace and community menstrual hygiene management (MHM) is in place via outsourced companies such as Rentokil and Flick who provide bins, personnel and disposal services. These services are also available in individual homes, and are checked every two months, including toilets, rubbish disposal areas, bathrooms and outlets for wastewater plus household compound. However, the data showed that few toilet facilities in hotels and within the community were designed to be accessible by people with a disability, the elderly, pregnant women or to support women's menstrual hygiene needs (other than disposal facilities). Despite the recognition in hotels of the existence of female employees' menstruation and the need for hygienic disposal of items, the gap in the data suggests there is no training in MHM (or broader social inclusion) in the workplace.

The gaps in the data also suggest that among many hotel operators' knowledge of government policies and their requirements for public/community and hotel WASH facilities to address the specific needs of people with a disability, limit their ability to fit within the International Labour Organisation's WASH-at-Work framework and to enact its requirements. Members of disability advocacy groups in Viti Levu confirmed that hotels tend not to specifically address the WASH needs of people with a disability.

The data from the Mamanucas study show there is also a need for a nuanced recognition of the GEDSI implications of water availability, quality and access within village communities, to understand that even a seasonal lack of access to drinking water and effective sanitation hinders gender equality by ignoring the needs of women in the community, who are likely to have higher demands for water during their period (due to the need to wash more regularly). In the workplace women require water to maintain an acceptable public standard of hygiene.

The findings suggest that there is some WASH training in the workplace but none related to MHM, so that many hotels would rely on knowledge that staff acquired in school. Within the community, there is no provision for the needs of people with disabilities, and family members are expected to assist/carry such people to toilet facilities. These examples suggest that collaboration and cooperation is key to socially inclusive engagement with female and male staff, with communities, and with the specific GEDSI requirements of the community.

The findings align with Heller's (2016) report on the Human Right to Safe Drinking Water and Sanitation on the role of gender equality in the realisation of the human right to water and sanitation. The report highlighted key areas to prevent and respond to gender inequalities in WASH to realise the human right to water and sanitation. It links with the Global Water Partnership, which has identified gender as a key cross cutting issue, and the Women for Water Partnership, which emphasizes the importance of cross-linking the implementation of SDGs 5 and 6. GEDSI WASH-at-Work can provide Illustrative Gender Targets and Indicators, as does SDG Target 6.2, i.e. By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. In addition, a value proposition for GEDSI WASH-at-Work can frame quantitative questions, i.e. what is the percentage of WASH staff aware of basic issues related to gender? What is the female-to-male ratio of WASH program staff? What is the percentage of women/girls in job skills training on operation and maintenance of water supply and sanitation, including for technical and managerial roles? What is the access to menstrual hygiene-related education, materials, and disposal options? What is the female-to-male ratio of persons who participate in community-based WASH committees or other decision-making structures?

In relation to people with a disability, the UN Disability and Development Report (2017) provides evidence that persons with disabilities remain at a disadvantage in global, regional and national efforts towards achievement of the SDGs. Recognition of disability-inclusive development in water and sanitation (SDG 6) is detailed as "Ensuring inclusive access to water and sanitation for person with disabilities requires accessible designs, including accessible toilets, water points, water carriers, bathing places and handwashing facilities" (UN, United Nations Disability and Development Report, 2017) . Accessible infrastructure development in urban and rural environments, public spaces, facilities and services (SDG 11) is of parallel importance to the participation of persons with disabilities in all aspects of society and development (UN, United Nations Disability and Development Report, 2017). And it is recognised that double disaggregation of data is needed to achieve the SDGs for those who

experience disadvantage based on more than one aspect of their identity, such as women and girls with disabilities.

Plan International's Rising Tides report (2022: 21) contends that "achieving greater climate resilience and challenging systems that generate the climate crisis requires close and healthy relationships with youth organisations. Closer relationships depend on building trust and prioritising opportunities for regular meetings, co-creation and learning between groups". By adopting a relational perspective, the tourism sector and the Fijian Government can consider: what can we do to be better partners? What can we change to become more responsive to the needs of youth groups?

5.5 Sanitation

Sanitation in the Mamanucas varies between resort access for guests and staff, and in the local Solevu village. In the resorts guests have access to well-maintained and regularly cleaned toilets, with housekeeping and cleaning staff trained in the proper use of chemicals to maintain the cleanliness of sanitation facilities. The ratio of toilets to guests is high (e.g. 1 to 2 guests in Plantation). Staff toilet ratio is lower (at 1:80) but staff respondents did not identify any concerns in accessing toilet facilities nor raise any concerns about security and safety. Access to toilets and showering facilities are generally considered adequate by staff (both women and men), and water is always available for flushing, washing and handwashing. Some staff raised concerns about blockages in staff toilets, and a need for training and awareness raising to improve understanding of how to properly use toilets and dispose of menstrual hygiene products to prevent blockages. In relation to sanitation for infants, nappy changing facilities are available in Castaway and Plantation resorts, but not Malolo (which is an adult only resort). Some resorts noted that baby change tables are only provided in women's toilets and that there is room to adjust this, noting 'western men take on caregiving' roles.

Staff in resorts receive training on cleanliness, hygiene etc., and, for those living in the village, there is transference of knowledge from resort practices to the village and home. For example, one respondent noted improved hygienic toilet maintenance/ cleaning at home as well as improved landscaping and beautification of the village from knowledge of gardening gained at the resort/s.

Solevu village households all have access to flush or water seal toilets, which respondents consider an improvement on the past when there were pit latrines. Whereas there were no concerns about water security for flushing toilets in resorts (because of the water source being from the desalination plant) communities mentioned issues with water availability during times of low rain and drought. They reported having to be water wise and save water during those times, particularly limiting water for toilet flushing and laundry with households prioritising water for drinking and cooking. Communities are very reliant on water-based sanitation and it was unclear what measures communities took to manage flush sanitation during times of drought, but evidence shows that in other locations this kind of water stress can lead to reversion to unhygienic practices.

Village sanitation access is a household responsibility, and hygiene is reported as variable. Interestingly, there are regular health checks by the village nurse, including of toilets, bathrooms and wastewater disposal. Both female and male respondents did not think there were any safety or security issues surrounding sanitation access to community toilets. However, safety issues in relation to access could arise for people with a disability and the elderly, particularly in post-disaster situations.
The community hall in the village has separate male and female toilet facilities, though these are not disability and elderly accessible. Household toilets are an individual/ family responsibility, whereas the community hall toilets are managed by the 'rai koro' committee.

Sanitation access for disabled and elderly people is a gap in both resorts (for guests and staff), and in the village. There are no specific design features (e.g. ramps, handrails, wide doorways) for people with disabilities or the elderly to access toilet facilities in resorts, and in some cases staff carry disabled guests when they need it. Resorts reported not having any people with disabilities on staff, though it was reported there are people with disabilities living in the local village. The lack of accessible sanitation was considered more of an issue in the village than the resorts, both for people with disabilities (e.g. wheelchair bound) and the elderly. Respondents indicated that carers were the only people who knew the hygiene and sanitation challenges of these people in detail, and carers were not specifically interviewed. The lack of accessible facilities in resorts is a potential barrier to resorts hiring people with disabilities as staff and to expanding their customer market to the elderly and people with disabilities.

The resort wastewater treatment plants are well managed systems, with some being managed both remotely and by staff engineers. Staff engineers demonstrated a good knowledge of the treatment processes. Treated effluent is used to water either gardens or the local forest. Solids are treated in drying beds then dried mixed with soil and used as compost / fertiliser. Limited information was collected on wastewater management in the village. One respondent indicated that wastewater goes to 'gardens and soil' but did not indicate how much treatment occurred.

5.6 Hygiene

Results show that hygiene practices in the Mamanuca Islands, in resorts and communities alike, are a recognized as a high priority with good knowledge about hygienic habits. Staff members in the various resorts know how vital personal presentation is, given their high levels of interaction with guests. Their role requires them to be hygienically clean before and during work as a top priority; they report that this is not only a requirement, but a habit from childhood. The key current difference is their heightened level of hygiene for all community members because staff are now able to afford personal hygiene items and to pass on their hygiene knowledge. However, the practice of hygiene behaviours at all times is difficult in the community during times of water stress.

The period of the COVID 19 pandemic has brought an increased awareness and a higher level of staying hygienically clean, boosted by the range of training the staff underwent in preparation for re-opening. Now, there are at least two plastic hand sanitiser bottles in use at all times, which are located in highly visited sections of her house, i.e. the kitchen and lounge room. A female respondent explained that her daughter constantly reminds her to maintain hygiene, as they are being taught this in primary school, which is a WASH-piloted school. She buys all her cleaning and hygiene products from the local supermarket.

A retired housekeeper following all her years of work, reported that she continues to carry out all the cleaning tips and tricks from her workplace. She stated that, even though she is not able to afford some cleaning agents used in the hotels, she buys the basic ones and uses them. An example is the cleaning agents for her toilet, whilst it is not a flush one yet, she ensures there is disinfectant and air freshener available.

While resort staff are expected to have the cleanest and neatest homes in their communities, some members observe that this is not so. A village headman commented that some staff homes are amongst the most disorganised in the village. He stated that the staff members are not home long enough, and during their days off, there are other family errands and obligations to attend to, so cleaning up their homes is not a priority. Another noted that perhaps the workers are too tired to clean their homes, so they just rest on their days off. This is similar to findings in Votualailai on the Coral Coast.

Having a hygienic clean home is not only influenced by resort staff, as each village has a special committee that investigates these matters for the community. The committee is called the ‘rai koro’, which loosely translates to village watch. The committee members make their rounds in the village, with brief stops in homes to check and ensure that individual homes and surrounds are clean and meet the required standard set by the committee. These include, ensuring that each house has a toilet and shower room. Some areas of inspection focus include, ensuring the toilets are clean, rubbish is disposed in the correct manner, i.e. separated and put away. It is during village meetings that the Rai

koro committee informs villagers of their overall observations and areas of improvements for some households. Some communities, on the other hand, believe that more training and awareness could be carried out to the villagers, particularly in the areas of WASH.

Regarding personal hygiene whilst at home, a few staff admitted that because they are not at work, it is not a 'must do'. They will only engage in hygienic behaviours if they are to go out of the house to run errands in town or elsewhere. One villager aptly commented, "resort workers are paid to maintain proper hygiene practices as opposed to the village setting where it is voluntary and dependent on individuals" SolevuVillage (M)_FG. Resort staff also undergo various hygiene trainings in their various departments, this is mostly in the kitchen and housekeeping departments. However, as resorts prepared to reopen, all departments undertook hygiene trainings, conducted by the Ministry of Health and Medical Services and Tourism Fiji. These were part of the Care Fiji campaign, via which each tourism accommodation or service was required to fulfill their obligations, if they wanted to reopen and receive guests. The communities, on the other hand, had to mostly rely on staff to share such knowledge with them, whenever they could.

The greatest challenge and concern regarding hygiene for staff and community members is the availability of water. Staff members highlighted their experiences during water stress; when it is being rationed, getting ready for work is an issue. In the communities, sometimes it is a matter of choosing between having a shower and doing laundry. One of the women commented that when a water shortage occurs, women are affected the most – because of hygiene and carrying out household duties; "first is we have to be ready to accept that issue and everything associated with no water, especially for us women. We really need to manage our water usage wisely and that means, only washing the necessary clothing/linen, with the rest being done later, when the supply is better".

Water shortages are also a major cause of inconvenience because the women will leave their homes for a few hours and head out to the nearby boreholes in the village just to do laundry; "But even this is a hassle, having to leave our home, to carry [it] to and from the boreholes. And in this day and age, this shouldn't be happening, in fact things should be much easier – no issues with water. And especially as we age." SolevuVillage (F)_FG. Another male community member highlighted that during the hot season, practising hygiene is a challenge; "Humidity and heat during the hot periods affect hygiene and during water problems one has to make the choice

between drinking and washing/bathing. They have the option of bathing in the sea though". SolevuVillage(M)_FG.

5.7 Climate change

5.7.1 Key Impacts and Concerns Relating to the Environment and Climate Change

Resort managers, staff and engineers as well as community members and village headmen almost universally indicated that they have concerns about the impacts of climate change, with a range of different kinds of impacts being mentioned. Respondents noted a number of climatic changes they have observed over time including increased cyclone frequency and intensity and changing weather patterns in terms of hot and cold conditions.

Respondents identified a range of environmental changes and concerns through the interviews, many of which are likely linked to, or exacerbated by, climate change impacts. Resort managers, environmental officers and staff particularly noted damage to coral reefs. The damage was attributed to bleaching events, with a particularly bad event in 2005 as well as breakage from increased wave action caused by tourist boats, strong and changing sea currents and cyclones. The coral damage was also linked to reduced fish size and abundance.

A number of respondents noted the changes to sand and beach size and location. This was particularly pronounced in the Malolo resort, where staff stated, '*One of our greatest concerns on the shifting of the beach profiles is – our beachfront has more rocks than sand now'*. This impact may be related to usual coastal variability or may be related to changing currents and patterns from sea level rise, higher tidal extremes and cyclones.

The increasing high tides and changed beach conditions were raised as concerns and risks to resort accommodation with increasing occurrence of and risk of inundation of resort buildings. The Chief Engineer at Plantation and Lomani resorts noted that the Pacific is experiencing disproportionately high tides. A number of resort staff and managers expressed concern that reduced environmental quality and increasing incidence of cyclones would negatively impact the number of tourists wanting to visit the Mamanucas.

Environmental concerns related to climate change raised by villagers in Solevu island similarly included coastal erosion. In addition, the headman reported that a river that used to flow in the 1970s had dried up, which was relayed as linked to the removal of trees and forests upstream. This dry riverbed can flood and erode with high intensity rainfall events with associated flooding risk to houses in the village. The impacts of hot weather extremes damaging soil health and crops are concerns for the village.

5.7.2 Adaptation Responses to Climate Change

Resorts are adapting their management practices to deal with both the chronic and acute climate impacts that are being felt. In response to coastal erosion, sand movement and higher tides, some resorts have constructed protective infrastructure such as seawalls to protect buildings (e.g. Castaway, Plantation). Plantation is already feeling the impacts of rising seas on their buildings and estimates that it may lose 30-40 rooms to high sea level rise. The Plantation Chief Engineer is overseeing a 4-step upgrade to the Resort. The upgrade includes dredging of the water channel, using sand to raise up the Arrivals Bure and Tavola Restaurant and construction of 40 rooms at a higher level than previous construction (above 800m sealevel). A seawall is being erected to avoid high tide coming onto the resort floor for the lower flat parts of the island. Planting of mangroves is occurring at two of the four interviewed resorts as a protection against coastal erosion. There is, however, often resistance to this, especially from the reservations teams, as trees can obstruct guest room's undisrupted view of the beach front and ocean.

The larger hotels (e.g. Castaway and Plantation) have a comprehensive suite of environmental protection and amelioration initiatives, many of which involve guests. Castaway and Plantation have a range of activities including: tree planting program (including of coconut trees at Castaway), coral

planting, giant clam farming, beach clean-ups, crown of thorn removal, turtle breeding, seaweed farming, turtle and wildlife monitoring and mangrove planting. Plantation and Castaway mentioned collaboration with FHTA, Tourism Fiji and the MES. In addition, Plantation works with a range of government and conservation partners and researchers to monitor and protect marine and reef ecosystems. The Plantation Sales Manager noted, “Feedback from guests and especially staff who do water based activities, is that marine life is improving. It will take a while to get back to its former glory, but it’s rebuilding slowly’.

Whilst a number of resorts (Plantation, Lomani and Castaway) rely on desalination plants for water supply, the energy source of these being diesel (non-renewable sources) and carbon emissions were not raised as a concern by any respondents, potentially due to lack of awareness of the connections between fossil fuel use and emissions.

Solevu village is concerned about coastal erosion, and is adapting measures by planting mangroves and trees. However, as one Village Headman noted, ‘Though we’re planting mangroves, it hasn’t stopped the waves from washing up further inland.’ Villages are reliant on support from outside (government or resorts) for major infrastructure such as seawalls. ‘We have sought assistance from the government for a seawall and also to do something with the dry riverbed - maybe dig it up properly so it doesn’t flood houses when it fills up during heavy rains.’ (Solevu_VillageHeadman_2).

The resorts support local villages with conservation initiatives. In addition, Solevu village is working with Ministry of Forestry and the Mamanuca Environment Society (MES) to replant forests. These examples indicate some level of destination-wide collaboration for specific initiatives such as marine clean-ups and protection measures.

5.7.3 Emergency Preparedness

All hotels reported that they have evacuation plans and procedures in place to deal with emergency events such as cyclone, tsunami and fire. For example, Malolo conducts fire drills every 3 months. There were, however, concerns from staff at a couple of the resorts that not all staff, particularly new staff, are aware of evacuation plans and procedures. Resorts are generally self-reliant through disasters. For instance, Plantation has their own emergency contingency supplies for evacuations and is able to be self-sustainable after natural disasters, including apparel, foods, supply, water, etc. They store a few weeks’ supplies.

5.8 COVID-19

At the resorts’ COVID protocols are in place with both staff and guests wearing masks as a matter of choice and frequently washing their hands and using hand sanitisers, which are located throughout the resorts. Each resort has COVID-related procedures and guests and staff testing positive are isolated

for a 7-10 day period or until they show a negative test. Whilst people are careful with handwashing, greeting and interacting with people, especially those showing signs of flu/COVID, there is less fear of COVID and people are treating it as something to be lived with and managed. Staff and guests are practising improved hygiene and sanitation since COVID. Consequently, COVID seems to have been accepted as the new norm and as part of a culture of adaptation. Staff have taken on board the training that has been provided through the revised post-COVID standard operating procedures related to sanitation and hygiene. These benefits can also be seen within communities and may be the result of employee learning at resorts and being passed on when returning home.

5.8 Tourism and Value Proposition

5.8.1 Tourism's Success Factors, Key Challenges and Sustainability Initiatives

Respondents identified several success factors of tourism in the Mamanucas. Hotel managers and workers believe what makes the Mamanucas attractive for tourists are the people and friendly staff, the quality of the local environment being safe and clean, the favourable weather, the facilities and services offered by the resorts and the location, being easily accessible and offering a range of attractions and other islands close by. Respondents also identified factors of success for the hotels and resorts specifically. Respondents agreed that while facilities promoting a safe environment, including for elderly and children, service and "hospitality in the bula spirit" (Castaway_Staff_FG) are important factors, often leading to guests returning. Several respondents also highlighted the importance of employers considering staff welfare, e.g. by providing free staff meals and accommodation and maintaining a positive relationship between senior management and staff, treating both guests and staff as family.

On the other hand, it has been recognised that tourism faces several key challenges, limiting development. Many respondents from different resorts highlighted the challenge of losing qualified and trained staff to employment opportunities overseas with better conditions and having to rely on less experienced staff. This situation is likely made worse due to many former tourism and hospitality workers having left the industry following the pandemic and closure of many hotels (IFC, 2020). Further, respondents identified climate change more broadly, and environmental issues, such as the degrading health and quality of beaches and the reef specifically, as challenges impacting future development. Some respondents also highlighted WASH-specific challenges, including the quality of the tap water and insufficient resources being spent on WASH practices, in particular upgrading equipment and training staff. In addition, funding to improve tourism infrastructure, and to address environmental issues within the wider destination were found to be limited. Resorts are also still unsure whether this initial "rush season" of visitors (Plantation_Staff_FG) following border opening will continue or slow down. This may influence financial decisions to invest in WASH and other tourism infrastructure. Tax incentives or concessions that are encouraging hotels to invest in improvements, such as internal and external development programs, capacity building, benefit sharing or leadership development for

landowners, are also not provided, highlighting an opportunity for the government to support such efforts.

In addition to existing challenges, tourism causes negative impacts, thus exacerbating some of the challenges resorts face. These include environmental impacts linked to climate change, pollution and reef visitation, as well as the change in destination image (new development vs. small scale island paradise), safety, cleanliness and commodification of culture, which will ultimately affect the visitor experience. In addition, the high uptake of tourism jobs (many involving night and weekend shifts) impacts on village life, including a lack of people available to participate in community project potentially improving WASH for local people (e.g. village clean-ups).

Hotels in the Mamanuca group of islands engage in a wide range of corporate social responsibility (CSR) activities. Many resorts in the group are members of the MES, which was initially funded by Castaway Island Resort. Presently, Castaway Island Resort no longer sponsors MES, as the property has its own environmental officer. However, the other members ~~who~~ together with other sponsors (MES Fiji, n.d.), fund the conservation and sustainability project MES conducts in the name of the tourism industry. “MES now represents the Mamanuca resorts to the local communities.” (Castaway). In turn, qualified resort staff, like Castaway’s Environmental Officer, represent MES to the communities to deliver environmental awareness raising activities with the villagers. Resorts also act as a middleman to connect visitors who wish to fund environmental projects with MES as the implementing entity. MES has also set up environmental clubs in several schools, providing education on issues such as climate change and land-based sources of pollution. Resorts are also engaging in regenerative activities, such as coral and mangrove planting and clams farming. Resorts also supported social initiatives, including sponsoring the local Kindergarten and supporting the local schools and sports clubs financially and via guests donating stationery and other equipment. Generally, community requests will be channelled through the land-owning unit and then presented to the owner/manager of the resort.

While most CSR initiatives reported by respondents focus on environmental and social activities, some of the resorts work with local communities on village projects related to improving WASH. A project in Solveu consists of installing a new borehole, plumbing, a meeting hall, public toilets and providing water to the school. Others have financed water tanks for some of the local families. A different resort was planning for their housekeeping team to conduct a public toilet clean-up.

These initiatives are examples of how resorts can support the improvement of WASH facilities within the host-community, and there is scope to expand on these. The arrangements with MES allow the resorts to deliver a wide range of environmental initiatives, and there is an opportunity to use this existing arrangement to broaden the focus of this work to enhance Inclusive WASH within the wider destination especially those linked to maintaining or restoring environmental health, such as projects improving wastewater management, and to plan for and enact climate resilient projects and disaster risk reduction actions. Existing connections to schools and awareness creation programs with villagers could include lessons on Inclusive WASH and resilience, and focus on climate change issues and actions.

5.8.2 Value Proposition

Views presented in the data illustrate the importance of Inclusive WASH to the success of tourism in the Mamanuca group of islands as it is reflected at dual scale, i.e. the stewardship of the destination (destination scale), and the importance of Inclusive WASH-at-Work (workforce scale and hotel scale). The data thus support the construction of a value proposition for the enhanced uptake of an Inclusive WASH-at-Work framework within the hotels and resorts in the Mamanucas, particularly addressing climate change resilience and disaster risk reduction actions.

Respondents provided evidence that Inclusive WASH is important to the future success of tourism in the Mamanuca group of islands. Hotel workers and managers envision a future with more tourists, more visitor spending and more jobs to cater to those tourists. This would also allow the hotels to invest in upgraded facilities and extensions/growth in room capacity. To achieve this vision, culture plays an important role, to be reflected in all aspects of the visitor experience. Also, making sustainability a priority was identified as critical and regarded as an important opportunity for the industry to capitalise on for future success.

There are many factors that influence destination choice, but tourism is image sensitive and risk averse (Shakeela & Becken, 2015). Studies suggest that the COVID-19 pandemic has led to tourists

considering safety, hygiene and cleanliness and self-care more strongly in the selection and evaluation of services (Jiang & Wen, 2020). This is also evident given that the main markets are family/multigenerational. The first phase of this study confirms this for Fiji. In a Q-method, three types of visitors to Suva and the Coral Coast were identified, all of which rated safety of the hotel as the most important factor when choosing accommodation (Loehr et al., 2022). Further, this study found that two out of the three groups placed WASH factors as important and that staff working at hotels within the destinations underestimated the importance visitors placed on safety and WASH impacts, such as WASH impacts on surroundings but also confidence in the safety and quality of drinking water (Loehr et al., 2022).

Implementing an Inclusive WASH-at Work programme will thus not only contribute to hotel success factors, such as staff wellbeing, happiness and quality of service provided, but if extended to address environmental and water stewardship specifically, and to climate change resilience and disaster risk reduction as crucial future measures, will also contribute to greater resilience and sustainability at the destination scale (Hadwen et al., 2015). This is important considering respondents have expressed concern about the impacts of environmental degradation, potentially affecting the visitor experience and brand image. Inclusive WASH has the potential to address some of the challenges destinations are facing by working to reduce negative impacts and support the tourism sector to create benefits to the wider destination, including the long-term advantage and survival of local communities.

6. Recommendations and Conclusion

6.1 **Climate Resilience for** GEDSI WASH-at-Work in Fiji

The research has demonstrated that climate impacts are already being faced in the Mamanuca Islands, with both resorts and local villages taking adaptation measures to protect their infrastructure, including WASH services.

- **Water access** in resorts is reliant on high energy intensive reverse osmosis, and concerns are primarily around leakage management, whereas in communities water access is less reliable and drawn from unprotected boreholes and rainwater tanks.

- **Sanitation** facilities are adequate in resorts which have good wastewater treatment facilities. Treatment of wastewater from village household latrines is not as evident.

- **Hygiene** practices in the Mamanuca Islands in resorts and communities alike are well understood and recognized as a high priority. Resorts provide regular training on hygiene, with this knowledge being shared and influencing community life. Practising hygiene behaviours at all times is more difficult in the community when there is water stress and people have to prioritise water for drinking, bathing, laundry and other uses.

- **GEDSI issues** arise in the gaps in people's knowledge, in the provision of WASH facilities in hotels and the community that address the access and needs of people with a disability, the elderly and male parents, and in the planning and supply of WASH infrastructure in relation to climate change challenges and disaster risk reduction actions. While gender equity is included in employees' meetings in that women are able to speak and have their viewpoints recognised, within the community men sometimes do not accept women's standpoints. Workplace and community menstrual hygiene management (MHM) is in place but there is no training in MHM (or broader social inclusion) in the workplace. Both points provide areas for improvement, e.g. hotels could assist communities to become climate resilient via a focus on the needs of people with a disability, and by building close and healthy relationships with youth organisations (see, for example, Plan International's Rising Tides report (2022: 21).

- **Tourism** operators and staff raised concerns about the long-term viability of tourism in the area, given the experienced and expected climate change impacts. As resorts that target and pride themselves on repeat visitors, the increasing frequency of cyclones and inundating tides is perceived as a risk to the attractiveness to guests.

- **Infrastructure** is being protected through a range of adaptative measures including planting of mangroves, building seawalls, shifting development plans to build further inland and on higher ground. Gauging a dry riverbed in the village to reduce flooding has also been proposed.

- **Environmental and water resource protection** measures are underway including to: replant coral, replant timber in catchments, undertake sea clean-ups and monitor and protect marine life are underway.

6.2 Recommendations for Fiji

The recommendations are made as steps towards achieving a vision of Fiji as a resilient tourism destination benefitting all stakeholders.

1. Government

1.1. Develop programmes to incentivise and subsidise household water tanks and larger solar panels and batteries to power the water pumps in villages.

1.2. Provide specific grants/mechanisms to support locally driven solutions to improve resilience of WASH systems (pressure etc).

1.3. Support community management of water and solar systems. For example, provide training to communities in the operation and maintenance of water tanks and solar systems.

1.4. Department of Water and Sewerage to increase awareness and strengthen implementation of water related policies and guidelines.

1.5. MoH advise councils to improve public area infrastructure, facilities and cleanliness of public toilets. This should involve reviewing how many public toilets are provided, ensuring there is soap available in all public facilities and that water is safe and that drinking fountains/dispensers are available and maintained.

1.6. Improve standards for residential sewage treatment and disposal in areas where houses are not connected to the mains. Department of Water and Sewerage to conduct regular checks of septic tanks in communities and treatment plants in resorts.

1.7. MoH to schedule more visits to communities and share information relating to hygiene and handwashing, and disability access, relating to climate change, disaster risk reduction and post-disaster actions. Community communication should be improved (providing schedules in advance and confirm visits via text or phone calls) and engagement.

1.8. Collaboration between MoH and Ministry of Education (MoE) to be increased to ensure WASH pilot programme, including WASH resilience, is rolled out in all schools as part of curriculum, material is engaging to reinforce practices in Mamanuca Community Schools.

1.9. Continued awareness and support for inclusion of GEDSI across all areas of WASH policies and plans, particularly in relation to climate change and disaster risk reduction, and post-disaster actions and addressing the specific needs of people with a disability, and strengthen their implementation.

1.10. Support current community systems that contribute to WASH such as the Village Nurse and 'Tiko Bulabula' programmes.

1.11. Government to design holistic recycling and solid waste management processes and facilities and support with proposed regulation the reduction of bottled water use at the resorts. Resorts to be encouraged to use branded metal water containers which can be topped up at water filling stations using desalinised water.

1.12. Government to provide support for village area composting and recycling.

1.13. Government to provide recycling bins to communities.

1.14. Government to subsidise home/resort water filter systems for desalinised/rainwater, thus preventing the distribution of bottled water.

1.15. Government to enhance access to relevant climate change science (e.g. predictions) to resorts and communities.

1.16. Government to provide or support the facilitation of grants to fund locally driven solutions to improve resilience of WASH systems (pressure etc).

2. Community / Civil Society Organisations

2.1. Communities to conduct GEDSI needs assessment research for requirements of WASH and post-disaster and risk impacts.

2.2. Consider the role of existing rural village committees to support household WASH management.

2.3. Community to review and enhance accessibility of toilets and showers, in particular for children, elderly, people with a disability and pregnant women.

2.4. Collaboration from communities with resorts to provide hygiene training.

2.5. Resort workers to share at village and church meetings and via women's and youth groups what WASH practices they learn at work.

2.6. Community members and parents practice good handwashing with soap behaviours and reinforce these messages to children. In contrast children also share the experiences they learn in school.

2.7. Maintaining COVID-19 awareness in community of staff risk and responsibilities when commuting between hotels and community.

2.8. Community to co-design with resorts and Ministry of Rural and Maritime Development and Disaster Management, through its National Disaster Management Office, disaster and risk management strategies to protect and reduce coastal erosion.

2.9. Install footpaths, toilets and showers in community halls that have safety ramps with disability access, especially during natural disasters such as floods and cyclones to help vulnerable people. Toilets should be disability friendly e.g. wider toilets with ramps that allow wheelchair access.

2.10. Village committees to explore women's' skills to provide biodegradable receptacles to hotels.

3. Resorts

3.1 To provide support to communities to apply for specific grants/mechanisms to provide locally driven solutions to improve resilience of WASH systems (pressure etc).

3.2 Assist with the operation and maintenance of community water supply services as part of their corporate social responsibility (CSR). Encourage resorts and communities to use water filter systems.

3.3 Resorts to provide or support training to communities for maintenance of water supply systems (e.g. checking of key water connections, ways of cleaning these, cleaning of water filters etc).

3.4 Review and update in resorts, where necessary, staff facilities, in particular staff water refill stations, toilets and showers (availability and distance from workstations) and female changing rooms.

3.5 Explore cost-sharing opportunities with communities on wastewater/septic tank maintenance.

3.6 Provide updated pandemic and WASH training annually to staff and communities as a component of corporate social responsibility (CSR). This should create awareness of staff risk and responsibilities when commuting between resorts and community.

3.7 Continue to adhere to high standards of resort cleanliness and staff hygiene practices as important to protecting staff and guests' health, as well as satisfaction. This involves management to strictly monitor practices and reinforce hygiene and sanitation SOPs and should include hygiene training.

3.8 Ensure safe WASH access for all guests' and staff (ramps, rails etc.) exits when planning for natural disasters.

3.9 Encourage resorts to conduct a risk assessment for the safety of people with a disability, the elderly, pregnant women and older staff members, particularly in hotel public areas, public toilets and guest bathrooms.

3.10 Encourage on-site waste management strategies especially as related to plastic and including glass crushing.

3.11 Engage guests in waste management processes at resort as part of CSR initiative, e.g. rewarding children, reducing food and plastic waste.

3.12 Resorts to encourage staff through community service to design community on-site waste management programmes.

3.13 Resort to take up composting or encourage staff to use food waste for their livestock etc. pigs.

3.14 Resorts to revise purchasing policies to reduce single use items and large shampoo, soap and conditioner dispensers and to focus on biodegradable items.

3.15 Resorts to factor in climate change predictions, adaptation and mitigation (a reduction of greenhouse gas emissions produced by the resort's activities) into business planning.

4. All Stakeholders

4.1 Review suitability of water system design to cope with natural disasters such as heavy rainfall, cyclones and encourage risk-based management (water safety planning).

4.2 All stakeholders to support the improvement of drainage in maritime areas for protection against extreme events such as storm surges.

4.3 MoH to provide education on prevention of NCD diseases, e.g. diabetes and high blood pressure.

4.4 As a disaster management and/or climate change response, following extreme rainfall events, ensure all community members are aware of water hygiene practices – more effective management plans in communities.

4.5 Improve engagement and collaboration between stakeholder groups and MES. For example, communities to engage with resorts for access to used cleaning and leftover soap and cleaning products. MoH/ Ministry of iTaukei Affairs/ MoWE, resorts and communities to collaborate in knowledge about production/ use of appropriate traditional cleaning and handwashing products where access is limited.

4.6 Consider GEDSI and inclusion of all relevant groups in WASH, climate change and disaster risk reduction planning, decision-making and management.

4.7 To provide support to communities to apply for specific grants/mechanisms to support locally driven solutions to improve resilience of WASH systems (pressure etc).

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