Honiara Urban Resilience & Climate Action Plan

A joint strategy for the Honiara City Council and the Solomon Islands Government

With support of UN-HABITAT's Cities and Climate Change Initiative | RMIT University Climate Change Adaptation Program

2016

Honiara Urban Resilience & Climate Action Plan (2016)

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Report developed for the United Nations Human Settlements Programme (UN-Habitat) *Cities and Climate Change Initiative (CCCI)*

Research conducted in partnership with Honiara City Council, Guadalcanal Provincial Government Council, Solomon Islands Government Agencies (Ministry for Land, Housing & Survey, Ministry for Environment, Climate Change & Disaster Management, Solomon Islands National Statistics Office), as well as numerous community and non-government organisations present and operating in the Greater Honiara Area.

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Foreword

The Honiara Urban Resilience and Climate Action Plan (HURCAP) aims to enhance the resilience of Honiara. It is the outcome of a concerted effort by many different stakeholders with an interest in the sustainability of our capital city, from national and municipal government to local communities. It recognises that there are many challenges facing the urban resilience agenda and that each of us, whether as policymakers or as Honiara residents, has a part to play.

Honiara has always been, and continues to be, at risk of natural hazards such as earthquakes, tsunamis and tropical cyclones due to its unique location. In more recent times, rapid urbanization is stretching the city's ability to accommodate the increase of rural-urban migrants moving to Honiara in search of a better life. This large movement of people towards the capital city has led to the rapid growth of informal settlements in and around Honiara. Due to poor housing conditions, the residents of these areas are highly vulnerable to natural hazards. Addressing the resilience needs of vulnerable communities is central to this Action Plan.

As we look to the future, climate change will exacerbate the multitude of risks the city and its residents face, through the impact of more intense extreme events or longer term stresses such as sea level rise, a reduction in the quantity and quality of the city's drinking water supply, or ocean acidification which damages local ecosystems and reduces our access to food for consumption or sale. Climate change will also worsen existing challenges such as poverty and inequality.

The complicated mix of climate and non-climate vulnerability causes was recognised in the development of the HURCAP. It sets out an integrated approach to addressing priority issues in Honiara relating to development, disaster risk reduction, and climate change adaptation. Indeed, addressing development problems in the informal settlements, and elsewhere in the city, will not only reduce the impact of natural hazards now but will also provide a valuable platform for implementing climate change adaptation measures and enhancing community resilience into the future.

This plan sets out an innovative framework for action that brings together previously disconnected agendas and involves multi-level actions that can be supported, and owned, by many different groups in the city. The priority needs and responses – at the city-wide, ward, and community level - have been developed in close collaboration with city and national Government, local communities, NGOs, and a variety of other interested stakeholder groups. This multi-level participatory approach reflects the strong and effective long-term partnerships that are needed to support Honiara's path towards a sustainable and resilient future.

The diversity of urban community ownership of the action plan lends HURCAP its strength and is fully endorsed. The multi-partner approach to resilience building for the city will be led and coordinated with the full support of the Honiara City Council, Ministry of Lands, Housing and Survey, and the Ministry of Environment, Climate Change, Disaster Management and Meteorology.

Hon. Andrew Mua	Hon. Moses Garu	Hon. Samuel Manetoali
Lord Mayor	**Minister for Lands, Housing & Survey**	**Minister for Environment, Climate Change, Disaster Management & Meteorology**
Honiara City Council	**Solomon Islands Government**	**Solomon Islands Government**

Acknowledgements

The Honiara Urban Resilience & Climate Action Plan was authored by Alexei Trundle and Darryn McEvoy, RMIT University, Climate Change Adaptation Program, Melbourne as part of the support that the United Nations Human Settlements Programme (UN-Habitat) provides to Pacific Island national and local governments under its *Cities and Climate Change Initiative (CCCI).* Overall Project management was provided by Bernhard Barth of the Regional Office for Asia and the Pacific.

The process of developing the Honiara Urban Resilience and Climate Action Plan was deliberately designed to be stakeholder-led, and as a consequence has benefited from valuable inputs from many local sources. Though too numerous to mention individually, the authors fully acknowledge all the contributions that have informed this action plan for Honiara.

Particular thanks go to Honiara City Council, the Ministry of Lands, Housing and Survey (especially the Physical Planning Unit), and the Ministry of Environment, Climate Change and Disaster Management, for their valued expert input to the stakeholder engagement processes, and their continuing support for the urban resilience agenda. Representation from Guadalcanal Province was also very much appreciated in the consideration of important cross-boundary issues.

The contributions from civil society organisations (such as Development Services Exchange) and from the vulnerability hotspot communities themselves constitute an important component of the action plan. The input from local community groups and individuals ensure that this document is firmly embedded in the local realities faced by Honiara. These contributions are acknowledged and appreciated.

Constructive engagement with international organisations with a presence in Honiara (UNDP and the World Bank being of particular note) has also added value to the compilation of this document. It is intended that a range of local and international organisations will continue to contribute to improving the resilience of Honiara into the future.

An early draft of this document which had ensued from these consultations was presented to a two day city consultation in August 2015 in which 70 stakeholders verified the findings and made significant contributions to the Honiara action plan.

Finally, special thanks go to the local representative for UN-Habitat, Steve Likaveke, for supporting the local engagement activity, providing access to the informal settlements, and for providing critical inputs into the community discussions.

Executive Summary

Honiara, the capital city of the Solomon Islands, faces a myriad of resilience challenges. Not only is the city already exposed to multiple natural hazards, a changing climate will amplify many of the adverse impacts into the future. At the same time, rapid urbanization - most obviously expressed through the growth of informal settlements in urban and peri-urban areas - is heightening community exposure and sensitivity to a range of climate and non-climate shocks and stresses.

In order to begin addressing these critical urban challenges, an initial vulnerability assessment was conducted as part of the UN-Habitat 'Cities and Climate Change Initiative'. Published just before the major 2014 Honiara flood event, the assessment had identified some of the most vulnerable informal settlements; and these were the communities that were worst impacted by the event. This experience of a recent natural disaster reinforced the need for actions to make communities in the city, particularly the urban poor, more resilient to other shocks and stresses in the current day and into the future.

To address this agenda, the vulnerability assessment was followed up by local adaptation planning activity that was designed to identify key issues, and establish priority objectives, for enhanced community resilience. This process was carried out in close collaboration with key stakeholders at different levels across the city (community, ward, and city-level); involving representatives from national, provincial and city government, NGOs, as well as members of vulnerability 'hotspot' communities. The Honiara Urban Resilience and Climate Action Plan (HURCAP) represents the culmination of the program of adaptation planning activity and sets out a portfolio of adaptation actions that can be implemented to directly contribute to resilience building in Honiara.

Priority actions that were identified through the participatory planning processes have been categorised according to 10 high-level thematic strands. The themes include: 1) Urban Planning & Land Development, 2) Housing, 3) Infrastructure, 4) Water, Sanitation and Waste, 5) Ecosystem Services and Coastal Processes; 6) Human Health and Well-being; 7) Communication: Awareness and Education, 8) Livelihoods and Behaviour Change, 9) Disaster Preparedness and Response, and 10) Governance and Partnerships. These categories are considered useful for framing adaptation processes and actions at multiple scales across the city.

Whilst the original intention was to develop a climate change adaptation plan, it became evident through engagement with local stakeholders that climate change is only one driver affecting the vulnerability of poor communities in Honiara. Existing exposure to climate variability (cyclones) and natural hazard extreme events (earthquakes and tsunamis) meant that disaster risk reduction principles also needed to be accounted for i.e. considering the impacts of immediate shocks as well as longer term stresses. Furthermore, Honiara has significant development needs relating to inadequate infrastructure and housing stock, and in the case of some informal settlements, even access to basic essential services such as water and energy.

Addressing these immediate development needs is therefore strongly reflected in this broader urban resilience and climate action plan which integrates climate change adaptation, disaster risk reduction, and development goals. The implementation of actions will not only reduce community exposure and sensitivity to shocks and stresses but will also result in a more solid socio-economic foundation for longer-term climate adaptation.

List of Organisations and Acronyms

ADB – Asian Development Bank
CCA – Climate Change Adaptation
CCAP – Climate Change Adaptation Program
CCCI – UN-Habitat's Cities and Climate Change Initiative
CLGF – Commonwealth Local Government Forum
DRR/M – Disaster Risk Reduction / Management
FTE – Fixed Term Estate
GPG – Guadalcanal Provincial Government
HURCAP – Honiara Urban Resilience and Climate Action Plan
JICA – Japan International Cooperation Agency
LUPS – Land Use Planning Scheme
MECCDM – Ministry for the Environment, Climate Change and Disaster Management
MEHRD – Ministry of Education & Human Resources Development
MoFR – Ministry of Forestry and Research
MHA – Ministry of Home Affairs
MHMS – Ministry of Health and Medical Services
MID – Ministry of Infrastructure and Development
MLHS – Ministry of Lands, Housing and Survey
MWCY – Ministry of Women, Children and Youth
NCCP – National Climate Change Policy
NDMO – National Disaster Management Office
NHL – National Health Lab
PACCSAP – Pacific-Australia Climate Change Science and Adaptation Planning Program
PCRAFI – Pacific Catastrophe Risk Assessment and Financing Initiative
PSUP – Participatory Slum Upgrading Programme
RCP – Representative Concentration Pathway
REP – Rapid Employment Program
RMIT – Royal Melbourne Institute of Technology
RSIP – Royal Solomon Islands Police Force
SICC – Solomon Islands Chamber of Commerce
SIDS – Small Island Developing States
SIMS – Solomon Islands Meteorological Service
SINSO – Solomon Islands National Statistics Office
SOPAC – SPC Applied Geoscience and Technology Division
SPC – Secretariat of the Pacific Community
TOL – Temporary Occupation License
UN-Habitat – United Nations Human Settlement Programme
WDC – Ward Development Committee
WBG – World Bank Group

TABLE OF CONTENTS

List of Figures

1. BACKGROUND: PLANNING A RESILIENT HONIARA UNDER A CHANGING CLIMATE

1.1 PLAN RATIONALE

Small Islands Developing States (SIDS) in the Pacific region have historically been exposed to a wide range of both climate-driven and geologically-related hazards; facing significant year-to-year variability in rainfall, weather extremes, and an ever-present risk of tectonic activity potentially leading to earthquakes and tsunamis. In addition to this, rapidly-increasing tropical ocean temperatures compound the sea level threats to low-lying islands, with observed rates of increases in sea level in the region often well above global averages. As a consequence, saline intrusion into water tables is compromising subsistence food crops, pressurising rural lifestyles and traditional ways of life. A combination of overfishing, plastics pollution, and warming-driven bleaching events are also impacting coral reefs and fish stocks; another key livelihood sector, tourism, offers an income source for island residents.

Major cities such as Honiara provide an alternative set of livelihood options for rural-dwellers; in particular through greater economic opportunities, services and education facilities. Over the last two decades this has led to significant rural-urban migration and rapid rates of urbanisation; with limited local capacity to meet the growing demand for urban infrastructure, job creation, health, education and basic services. Given current day development needs in the city, as well as having to plan for inevitable urban growth in the future, actions to adapt to climate change need to be embedded within this broader urban development context.

As a result of the many challenges facing the city, this plan has been widened in scope to address urban resilience beyond just climate change adaptation, and as such has been titled the *Honiara Urban Resilience and Climate Action Plan* (HURCAP). This aligns with the new strategy for resilient development in the Pacific region, which seeks to *"strengthen the resilience of Pacific Island communities to the impacts of slow and sudden onset natural hazards by developing more effective and integrated ways to address climate and disaster risks, within the context of sustainable development"* (SPC and SPREP 2015, p2).

1.1.1 PLAN DEVELOPMENT PROCESS & CONTEXT

This document concludes the second phase of UN-Habitat CCCI's *Planning for Climate Change (PfCC) Honiara* Process, with the first phase culminating in the release of a Climate Change Vulnerability Assessment for the city in early 2014 (UN-Habitat 2014a). The first phase Vulnerability Assessment was formally endorsed by the Honiara City Council and the two Solomon Islands Government (SIG) focal ministries (MLHS & MECCDM) in August 2015, with the Lord Mayor and the respective SIG Ministers committing to work across scales of government in the development and implementation of this Urban Resilience and Climate Action Plan. An overview of the key milestones and outputs from the HURCAP process is outlined in Figure 1 below.

As set out in the *Solomon Islands National Climate Change Policy 2012-2017* the development of Adaptation Strategies and Vulnerability Assessments for Honiara is an explicit policy priority for the country [NCCP 8.3.1(3)(i)]. This legislation provides a clear directive for urgent action to reduce the climate risks that the city and other urban areas face (MECCDM 2012, p21). As such, the HURCAP provides a valuable and timely platform for implementing adaptation and resilience-building actions for Honiara. For example, ecosystem-based adaptation actions [highlighted in NCCP policy directive 8.3.1(3)(h)], have been prioritised and proposed by community, government, and civil society representatives throughout a series of workshops and the Honiara Adaptation Planning Forum held in 2015.

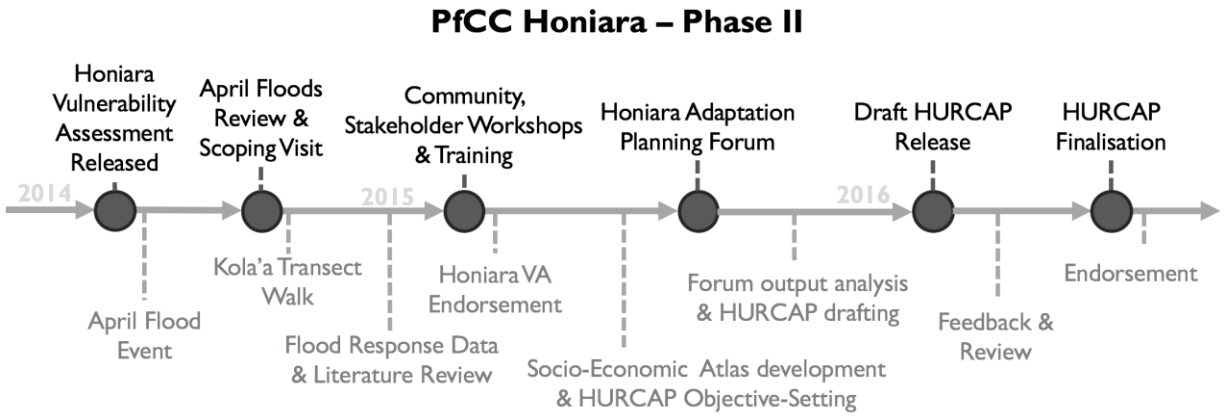

Figure 1: Outline of the second phase activities involved in the development of HURCAP

1.1.2 THE UN-HABITAT PLANNING FOR CLIMATE CHANGE PROCESS

The UN-Habitat *Cities and Climate Change Initiative (CCCI)* seeks to integrate climate change preparedness and mitigation activities within cities in developing countries across the globe. As part of this agenda, CCCI is in the process of developing climate change assessments and strategies in over 300 cities in the Asia-Pacific region, following the stages set out in *Planning for Climate Change: A Strategic, Values-based Approach for Urban Planners* (UN-Habitat 2014b). A number of Climate Vulnerability Assessment reports from the first Phase of this process are available to the public on the UN-Habitat website, with those in the Pacific Region shown in Figure 2. It is intended that these reports will provide a baseline for comparison between cities, and allow for collaboration and sharing of climate change adaptation planning techniques and approaches.

Figure 2: Publicly Available UN-Habitat Climate Change Vulnerability Assessments in the Pacific

The Planning for Climate Change approach (PfCC) consists of four cyclical modules, structured to enhance compatibility with the ongoing and iterative nature of urban planning structures and action plan implementation. A high-level overview of the approach, as well as some of the core step-by-step activities and suggested timelines is shown in Figure 3, with the steps specific to Phase 2 highlighted in blue.

Although *PfCC* Steps 4 through 6 were the focus of the HURCAP development process, the ongoing widening of stakeholder engagement and participatory input (Step 2), as well as engagement with other adaptation-related initiatives and implementation programs (such as the development of the Honiara Land Use Planning Scheme (SPC/HCC/MLHS), and the Honiara Flood Risk Management project (WBG)) were also critical to ensuring the plans currency and maximising stakeholder 'buy-in'. Additional data availability, new policies and plans, as well as the community's experience through the April 2014 floods, were also integrated into the original vulnerability assessment (Steps 1 and 3). These updates are detailed in Section 2 of this Action Plan.

UNH CCCI Planning Process Stage	Activities & Key Issues	Timeline
Module A: What is Happening?		
Step 1: Getting Started	Desk-based review of publicly available documents, data gaps	2 to 3-months, with review of literature as new policies & documents emerge.
Step 2: Stakeholders and Participation	Best facilitated with in-country 'champions' who can act as local contact points/co-ordinators.	An ongoing task over the course of the project, with several days of meetings at the beginning to get organized.
Step 3: Vulnerability Assessment	Integration of community viewpoints with climate and non-climate data.	A 1 or 2-day workshop followed by several months to a year of study.
Module B: What Matters Most?		
Step 4: Issues & Objectives	Activities and community engagement will vary.	From a 1-day workshop with stakeholders, to several months or more.
Module C: What Can We Do About It?		
Step 5: Identify Options	Depends heavily on level of engagement, expertise and funds.	Initial options can often be identified in a 1 or 2-day workshop.
Step 6: Option Assessment	More comprehensive assessment can take several months.	Options can be evaluated in a 1 or 2-day workshop plus advance preparation.
Step 7: Implementation	Actual implementation timelines will vary depending upon the scale and scope of the actions.	Depending on organizational capacity, development of the final *Climate Change Action Plan* can take months.
Module D: Are We Doing It?		
Step 8: Monitor and Evaluate	M&E processes required and need extensive mainstreaming for ongoing data collection.	Initial framework could be developed in a 1-day workshop. Development of full plan will likely take 1 or 2 months.
Step 9: Adjust and Modify	As climate impacts evolve and change, corresponding adaptation actions may require modification.	Ongoing.

Figure 3: UN-Habitat *Planning for Climate Change* high-level structure

The effective implementation of climate adaptation actions will require the support (and leadership) of local communities as well as differing levels of government. This action plan has been structured to map to departmental jurisdictions, objectives, and multiple scales of government. The 12 urban wards are considered to have considerable potential for resilience actions, with engagement through Ward Development Committees (WDCs) and local social networks. With English literacy rates in Honiara estimated to be around 86%, use of alternative verbal, theatrical and Pijin-based communication and engagement approaches will be a critical aspect of the *PfCC* process as it continues into the next implementation-focused phase. Section 5 of this Action Plan goes into more detail on some of the approaches

for building broader awareness of the HURCAP, as well as a deeper stakeholder and community understanding of the issues and potential approaches related to urban resilience and climate change adaptation.

1.2 A PARTICIPATORY APPROACH

Development of this strategy was underpinned by participatory, bottom-up engagement approaches and input, with all adaptation and resilience-enhancing actions being identified and developed by community representatives and local stakeholders. The data around climate vulnerabilities that informed this process was developed through the integration of quantitative datasets with community-based observations of past events and recent changes, allowing for critical consideration of both community and scientific understandings of climate variability and change.

Figure 4 shows some of the activities conducted across the city throughout 2014/15, which in total involved over 280 individuals representing informal settlements, government, youth, donor organisations, NGOs, utilities and business groups. These activities culminated in a two-day forum, attended by 93 community members who provided high-level input to the plan through open forums and project presentations; and informing the ward-level actions that form the basis of the action component of this plan (Section 4).

Figure 4: *Planning for Climate Change* stakeholder & community activities (Photo Credits: Mullett & Trundle)

With approximately a third of the city's population living outside of government-tenured land, and strong cultural and social networks and community leadership structures providing the basis of much of the response to the April 2014 floods, it is clear that participatory action planning is already deeply embedded within Honiara's daily life. The HURCAP aims to provide a model for building existing knowledge, approaches, and social structures into the formal governance mechanisms for the city.

1.3 URBAN PLANNING CONTEXT

From a legislative perspective, urban planning in the Solomon Islands falls under the *Town and Country Planning Act (1996)*, which provides for local planning scheme development for the entirety of the Honiara Town Council's jurisdiction, as well as adjacent areas of Lengo and Saghalu in Guadalcanal Province (outside of the boundaries of customary land). Governance within the Honiara municipal area is determined through the *Honiara City Act (1999)*, with the structure of the Honiara City Council (HCC) set out in more detail in Section 2.1. The amended *Land and Titles Act (1996)* provides the basis for land releases and zoning within the municipal boundary, under the directives of the newly-established Land Board which consists of representatives from HCC, the Ministry for Land, Housing and Survey (MLHS), and permanent secretaries of a number of relevant ministries. MLHS is also responsible for the ongoing implementation of a city-wide initiative to subdivide and formalise the large areas of land settled on illegally, or through short-term temporary occupation licenses (TOLs), with the support of the UN-Habitat *Participatory Slum Upgrading Programme* (PSUP).

Updating the HCC Local Planning Scheme was a key preliminary recommendation of the Honiara Climate Vulnerability Assessment (UN-Habitat 2014a, p43). This task has subsequently been completed, with the *Honiara Local Planning Scheme 2015* (LUPS) gazetted in October 2015 following a lengthy period of public and expert consultation. In addition to enhanced regulations around protection of service and utility network access routes and infrastructure, the LUPS explicitly aims to prevent unsafe development in areas exposed to natural hazards under both current conditions and projected climate change (including a coastal and riverine flooding overlay, and engineering requirements in areas with a gradient steeper than 45 degrees). The scheme also outlines areas for future urban expansion, urban greenspace reserves, and a structure plan for the city centre (including open space and a potential rezoning of the Point Cruz industrial area).

Urban planning processes interact with national climate change legislation through the *Solomon Islands National Climate Change Policy 2012-2017*, which sets out a number of high-level policy directives for the communication, development and mainstreaming of climate change adaptation approaches and actions (outlined in Section 1.1). Central to this within the urban context is policy directive 8.8.1(c), which requires the national government to:

> *"…strengthen coordination and consultation between government Ministries and Provincial governments to ensure that climate change funding via the government or NGOs support the implementation of this policy and includes provincial government, Honiara City Council and community representatives in the project cycle stages" (MECDM 2012, p35).*

Other related SIG policies and strategies include the National Development Strategy 2011-2020 (which contains initiatives such as the Honiara Road and Bridge Improvement programme and the Tina River Hydropower Scheme), as well as standalone initiatives such as the development of an urban health policy and the relocation of the National Referral Hospital. An updated National Development Strategy was launched in April 2016, with five headline objectives:

- Sustained and inclusive economic growth.
- Poverty alleviated across the whole of the Solomon Islands, basic needs addressed and food security improved, and benefits of development more equitably distributed.
- All Solomon Islanders have access to quality health and education.
- Resilient and environmentally sustainable development with effective disaster risk management, response and recovery.
- Unified nation with stable and effective governance and public order.

The municipality operates eight portfolios: education; land and planning; works and transport; trade and commerce; law enforcement; finance administration; health and environment; and youth, sports and women. Although each of these portfolios has relevance to urban planning, climate change, and urban resilience, the *Honiara City Council 5-Year*

Strategic Plan 2014-2018 provides the overarching framework for urban planning across the city at a local government scale. The city wide vision and mission statements, as contained with this document, are as follows:

- **HCC Vision Statement:** For the City of Honiara to be acknowledged as a clean, safe, harmonious, environmentally-responsible, prosperous and resilience capital city providing a high quality of life for its multi-cultural community and its visitors.
- **HCC Mission Statement:** For the City to work in partnership with the community to deliver a range of high standard facilities and services, and to improve the quality of life for its citizens.

The HURCAP development process has attempted to align initiatives with the 8-point development agenda set out in the *HCC Strategic Plan*, allowing actions to maximise and reinforce existing or proposed projects (such as, for instance, waste water treatment at the Ranadi dump site, and cleaning programs for the Mataniko River). The HURCAP will also set out specific tasks to more broadly defined *Strategic Plan* projects, such as the improved resilience of vulnerable communities (Project No. 3.8, 2017).

2. CITY PROFILE & CLIMATE VULNERABILITY

Honiara's city-wide Climate Change Vulnerability Assessment was completed in early 2014, following a year and a half of extensive consultation with community members, government experts and stakeholder groups (UN-Habitat 2014a). The following section of the plan summarises the findings of this assessment, as well as integrating supplementary information and data collated during the second phase of *the PfCC-Honiara* project including new quantitative socio-economic information at a sub-ward level (Trundle & McEvoy 2015). Similarly, preliminary identification of key adaptation actions in the Vulnerability Assessment Report (UN-Habitat 2014a, p37) was used to inform the adaptation options outlined in Section 4 of this action plan.

Shortly after the release of the Honiara Climate Change Vulnerability Assessment, a prolonged period of heavy rain in April 2014 led to a significant flood event that resulted in 22 fatalities, displacement over 9,000 residents, destruction of 675 homes, and an estimated total damage bill of US$108.9 million. Additional information arising from this event has been considered in the actions and the findings embedded within this plan.

2.1 CITY STRUCTURE, DEMOGRAPHICS & GOVERNANCE

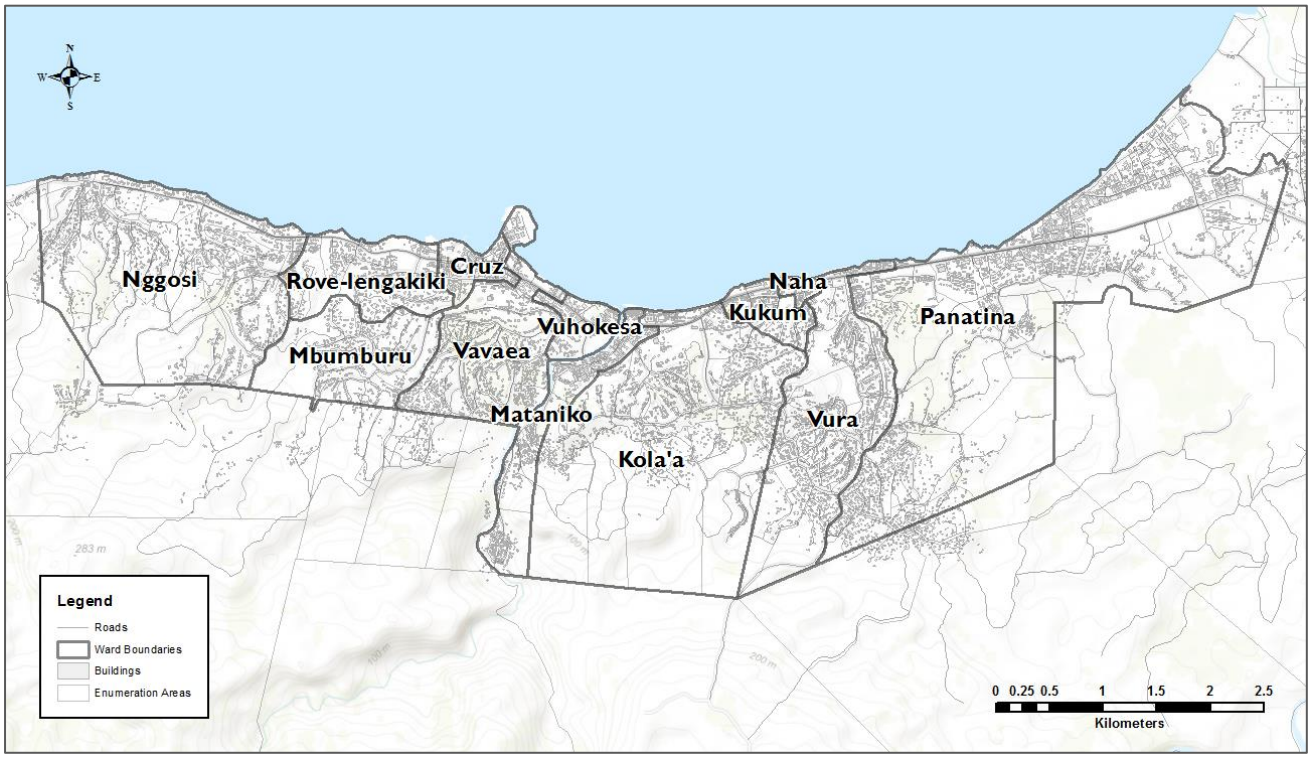

Figure 5: Study area delineated by ward and associated peri-urban surrounds

HCC has jurisdiction over the municipal area, as shown in Figure 5, encompassing approximately 23 square kilometres of rugged hills and valleys rising up from the northern coastline of Guadalcanal Island. Honiara is the capital city of – and the only city in – the Solomon Islands, although there are a number of urban-classified townships and settlements on other islands across the archipelago (such as Gizo, Noro, Munda and Auki), as well as peri-urban wards on the city fringe within Guadalcanal Province (Tandai and Malango). The Honiara municipal area is divided into 12 wards, each of which is represented by a single elected councillor. The remaining council positions are comprised of four members appointed by the Minister for Home Affairs – of which one is a female councillor put forward by the Solomon Islands Council for Women – the three members of parliament that represent the Honiara city area, and the premier of Guadalcanal Province (CLGF 2012).

From a population of less than 20,000 at the country's Independence in 1978 the city has grown rapidly to an estimated 87,000 residents in 2015, despite civil unrest disrupting rural-urban migration in the early 2000s (SINSO 2011). While the growth rate of the municipal population has slowed over time, peri-urban areas around the city have continued to grow rapidly, including the Guadalcanal wards of Tandai and Malango which grew at an annual rate of 16.4% over the decade prior to 2009. Figure 6 depicts total population growth and average annual growth rates for urban areas, rural areas, and the Honiara municipality over the last four decades, as well as the official projections for a medium population growth scenario to 2050. Notably, the disrupted process of urbanisation in the Solomon Islands following the 1999 census limits the capacity to project future trends. Fieldwork conducted as part of the HURCAP process suggests that rural-urban migration has accelerated, and may continue at significantly higher rates than those projected in the SINSO *'Constant Migration'* scenario shown below.

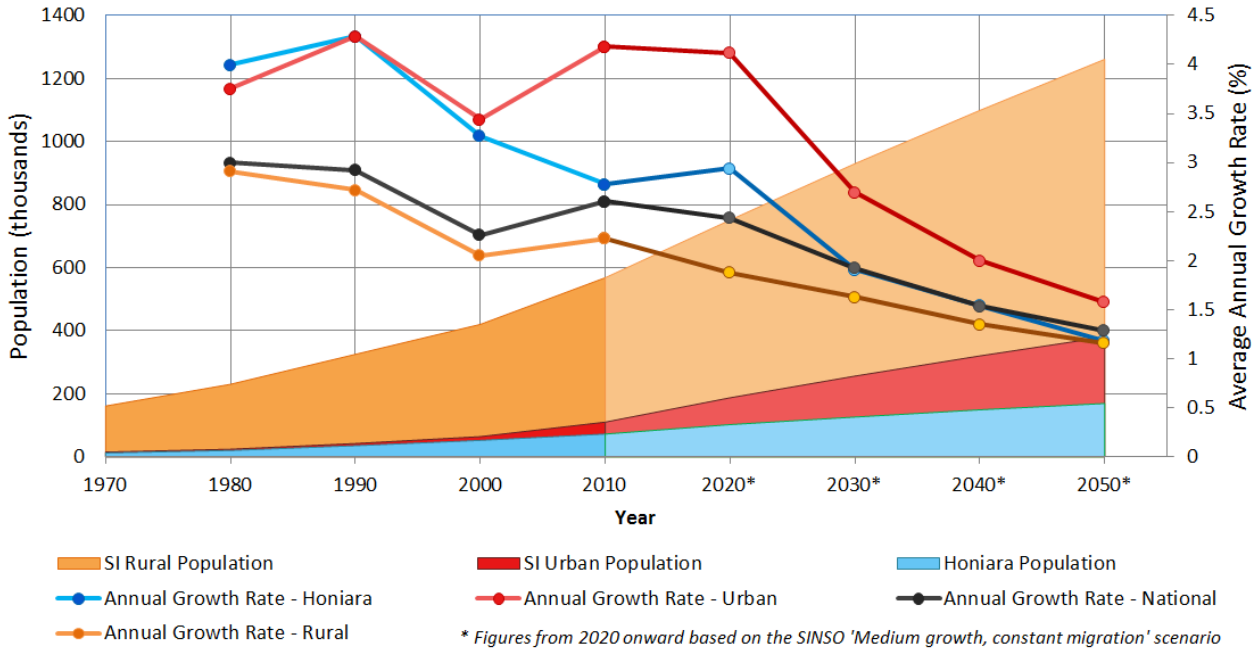

Figure 6: Solomon Islands historical and SINSO-projected population & average annual growth rates

Although Honiara's population growth rate has slowed in recent years, a sizeable area of land within the municipal boundary could yet be developed, particularly in the southern sections of the Kola'a and Panatina wards (see Figure 5). However, growth in these areas has been limited by a lack of road access, utilities and government land releases. This has contributed to the growing share of the city's population living in informal settlements – in temporary or makeshift housing – now estimated to house 35 – 40 percent of the municipality's total population. This figure is likely to increase yet further if not addressed through relocation and formalisation of tenure. This process, which is already underway, includes the transfer of Temporary Occupation Licenses (TOLs)[1] and un-licensed or lapsed settlement areas into Fixed Term Estates (FTEs). UN-Habitat currently supports SIG and HCC through the Participatory Slum Upgrading Programme which includes the development of a comprehensive settlements upgrading strategy which incorporates the recommendations of this strategy. This will not be a simple exercise however as community negotiations, surveying, and relocation of informal settlements that obstruct road access and utilities access or are in areas at high risk from natural hazards requires extensive administrative support and planning time.

[1] Temporary Occupation Licenses were established prior to national independence during the 1960s, and were designed to allow construction of non-permanent housing on a short-term, annual basis for a minimum fee, with no access to services and utilities. Collection of these fees and regulation of TOL zones has lapsed for a number of years, with only 2% of informal settlers holding a valid, current license in 2005 (UN-Habitat 2014a, p20).

As shown in Figure 7, spatial analysis of the growth patterns across the city over the decade preceding the 2009 census shows that Honiara's urban footprint continues to expand, with the population in the more established areas of central and eastern Honiara largely stable (Trundle & McEvoy 2015). A breakdown by wards highlights this distinct spatial distribution, with population growth since 1999 focused within Nggosi (5.7% p.a.), Mbumburu (5.0% p.a.) and Panatina (4.7% p.a.), while Cruz and Naha shrunk significantly (at rates of -6.3 and -6.0 percent per annum respectively) (Trundle & McEvoy 2015). In contrast the peri-urban provincial area of Tandai grew by 25.75% annually to reach a total population of 10,083 by 2009.

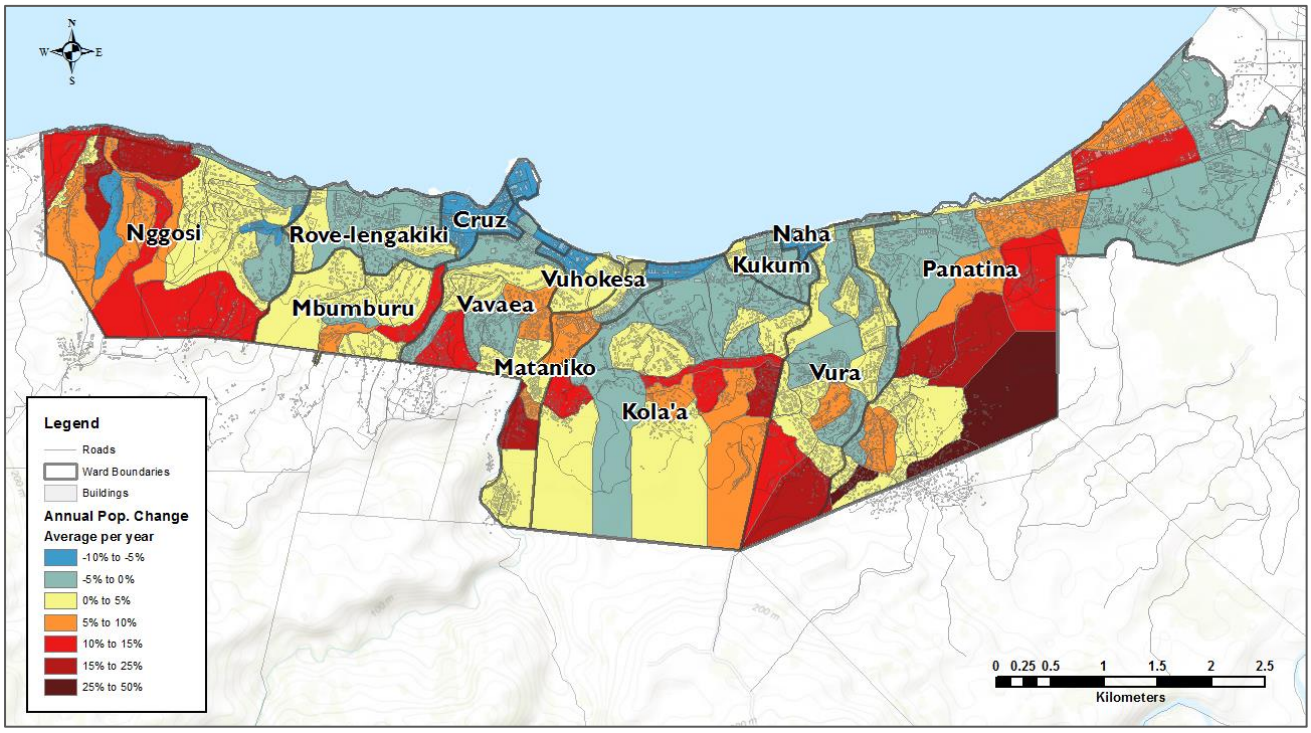

Figure 7: Honiara population growth estimates 1999-2009 by 1999 Enumeration Area (Trundle & McEvoy 2015)

As shown in Figure 8, ward populations have shifted significantly since their establishment, and legislative review to adjust proportionality of representation is long overdue. Although the development of this action plan involved the identification of climate adaptation and resilience-enhancing actions at a ward and sub-ward level, it is recognised that these sub-municipal structures will need to undergo revision to better reflect the shifting sizes of their constituencies, as well as the increasing demand for new infrastructure as the newer 'fringe' urban development areas grow and are given formal tenure arrangements. At a national level, the rapid increase in residents within the municipal area has also led to Honiara's three national electorates representing nearly double the number of constituents of their rural counterparts (SINSO 2011).

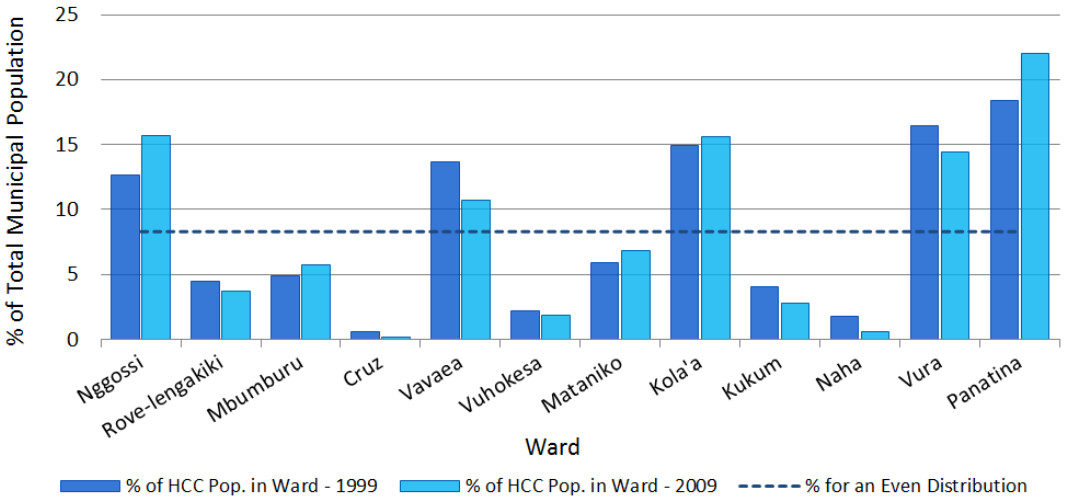

Figure 8: Relative population distribution by ward 1999 & 2009

The pull factors of jobs, education and access to the global economy has attracted a large number of young people from the provinces to Honiara; in all, 58% of the city's population is less than 25 years old, a third of the population being less than 15 years of age. While the number of young people aged 15-25 is distributed relatively evenly across wards (with the exception of Cruz, which has only a third of its population within the youth age bracket), the distribution of children is more distinct. As shown in Figure 9, young families are concentrated in the same growth areas evident in Figure 7, namely Nggosi and Panatina.

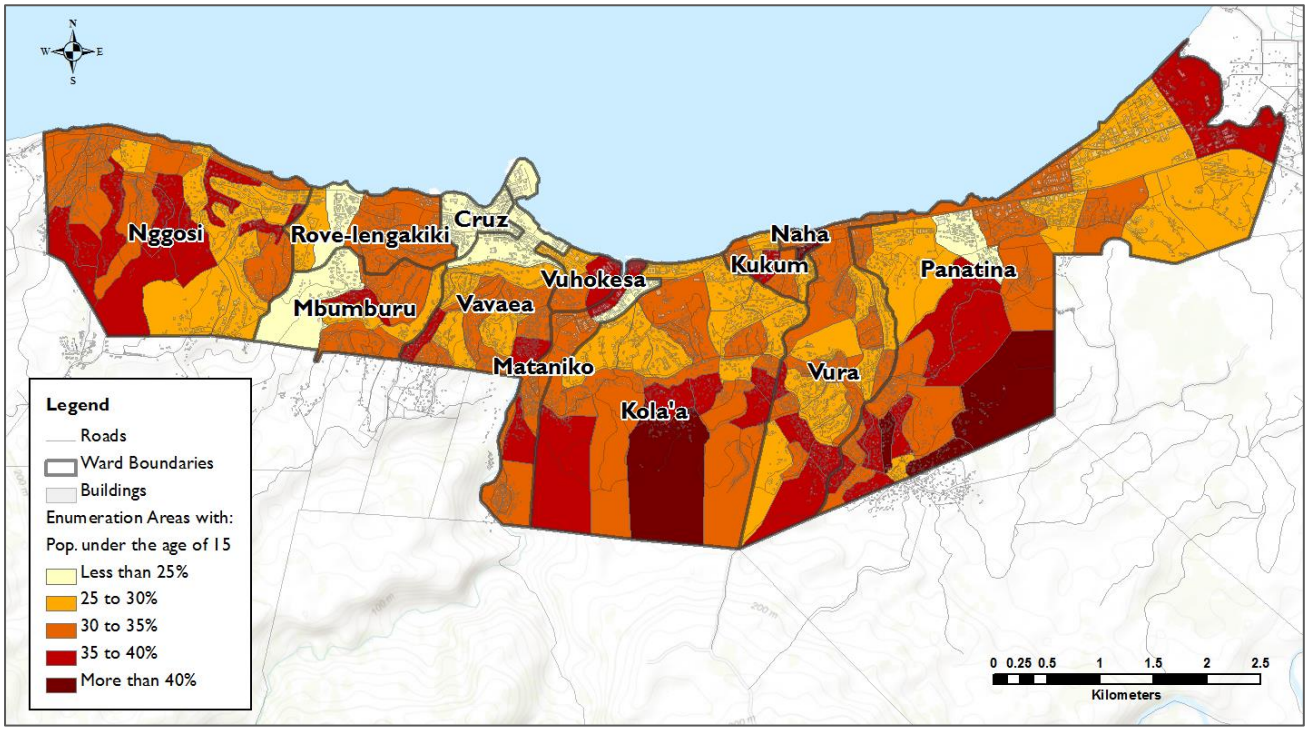

Figure 9: Percentage of total enumeration area population less than 15 years old, 2009 (Trundle & McEvoy 2015)

This 'youth bulge' represents both a challenge and an opportunity for the city. Although the limited number of jobs available has led to high levels of youth unemployment (with associated issues such as heightened occurrences of anti-social behaviour), the concentration of education institutions, youth groups and strong social networks provides a strong capacity for engagement with an active and creative section of the community. Training programs such as the

Rapid Employment Project (REP) provide pilot examples of how these sectors of the community can be involved productively in the development of Honiara's urban infrastructure, while at the same time providing jobs and training opportunities (World Bank 2015a).

2.2 VULNERABILITY ASSESSMENT FRAMEWORK

As outlined in Section 1.1 of this Action Plan, *Planning for Climate Change: A Strategic, Values-based Approach for Urban Planners* sets out a cyclical 4 module framework for assessing, prioritising, and acting on climate change challenges within urban environments. Central to this approach is developing an understanding of the relationship of the urban system to current and future climate impacts; determined through spatial, sectoral and social analysis of the city and its components' vulnerability to climate-related shocks and stresses.

Consistent with internationally recognised methodologies, vulnerability has been analysed through three component parts; a product of (1) exposure and (2) sensitivity, which are counteracted by (3) adaptive capacity. This theoretical framework is commonly expressed as an equation, as shown below:

$$Vulnerability = \frac{Exposure \times Sensitivity}{Adaptive\ Capacity}$$

Examples of measures that were used to assess each of these components are highlighted in Figure 10.

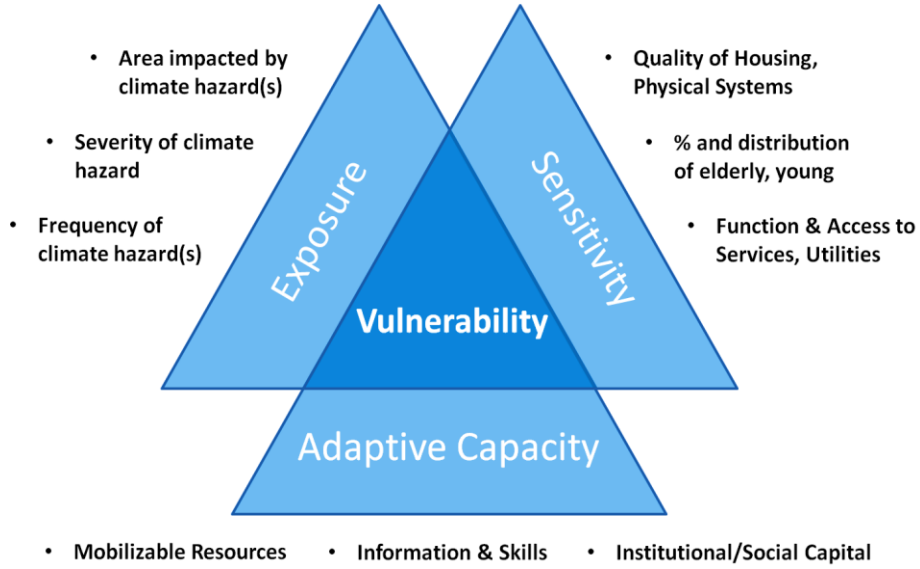

Figure 10: Illustration of the vulnerability framework

- **'Exposure'** refers to the extent, frequency, and severity of the climate-related shocks and stresses that the city faces, such as the low lying areas likely to be inundated by sea level rise, or the chance of a category 5 cyclone hitting the city in any given year.

- **'Sensitivity'** is defined as the factors that determine how affected the city will be when such an event hits; for instance, the young, sick and elderly are more at risk during a heatwave, while weaker buildings are more likely to collapse during a severe storm event.

- **'Adaptive capacity'** relates to the ability of the city, its institutions, and its citizens to respond to such an event, whether through formal disaster response arrangements (such as NDMO evacuation centres), or through social, traditional or informal means (for example, relying on relatives and kinship for temporary housing and support following the April 2014 floods).

All three of these variables also change over time, with trends and projections for socio-economic factors (sensitivity) as well as shifts in social, government and institutional characteristics (adaptive capacity) to be considered in parallel with projected shifts in exposure to climate-related shocks and stresses driven both by climate change and more immediate (largely locally-driven) environmental modifications (such as upstream deforestation increasing riverine flood exposure).

2.3 EXPOSURE TO CLIMATE-RELATED HAZARDS

2.3.1 AVERAGE ANNUAL CLIMATE CONDITIONS

Honiara is located 9°25'59" south of the equator at a longitude of 159°56'59" East, and has a two-season tropical monsoon climate. Annual temperatures show little variation month to month, with minimum and maximum daily temperatures ranging on average from 22.0°C to 23.5°C and 30.1°C to 30.7°C respectively (SIMS, BoM & CSIRO 2013). In contrast, rainfall varies distinctly on an annual basis, with 70% of average annual rainfall falling within the November-April wet season (known as *Komburu)*, while rainfall during the dry season (or *Ara*) averages only 110mm per month (see Figure 11 below).

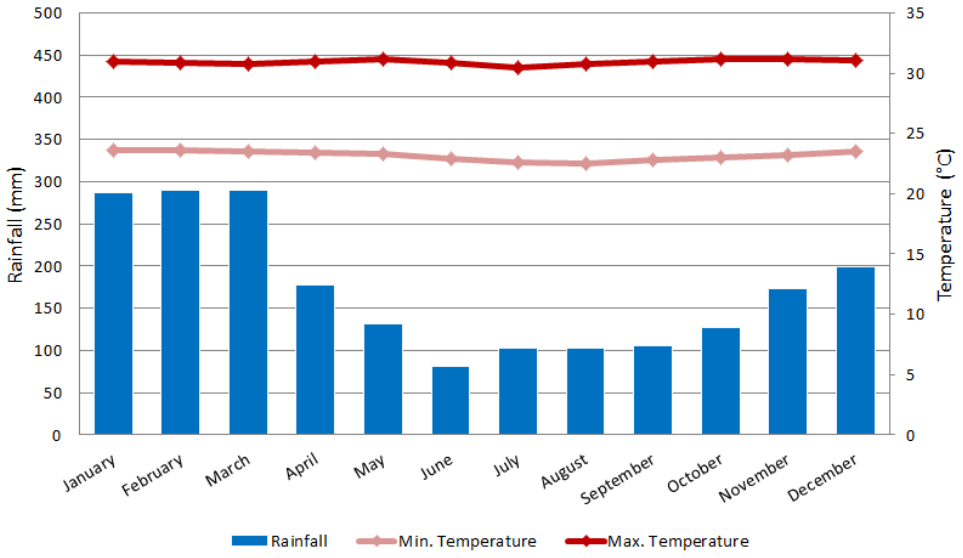

Figure 11: Honiara Monthly Average Rainfall and Temperature (data sourced from SIMS)

Despite these long-term averages showing distinct rainfall patterns and temperature stability, the location of the Solomon Islands at the juncture of the South Pacific Convergence Zone, the Inter-tropical Convergence Zone, and the West Pacific Monsoon leads to significant inter-annual variability, particularly in terms of total annual rainfall. This variation is attributed to shifts in these regional systems, such as to the movement of hot and cold water across the Pacific associated with the El Niño-Southern Oscillation. The extent of this inter-annual variation is shown in Figure 12, with total annual rainfall in 1969 recorded as roughly three times that of the previous year (3300mm, followed by 1110mm in 1970).

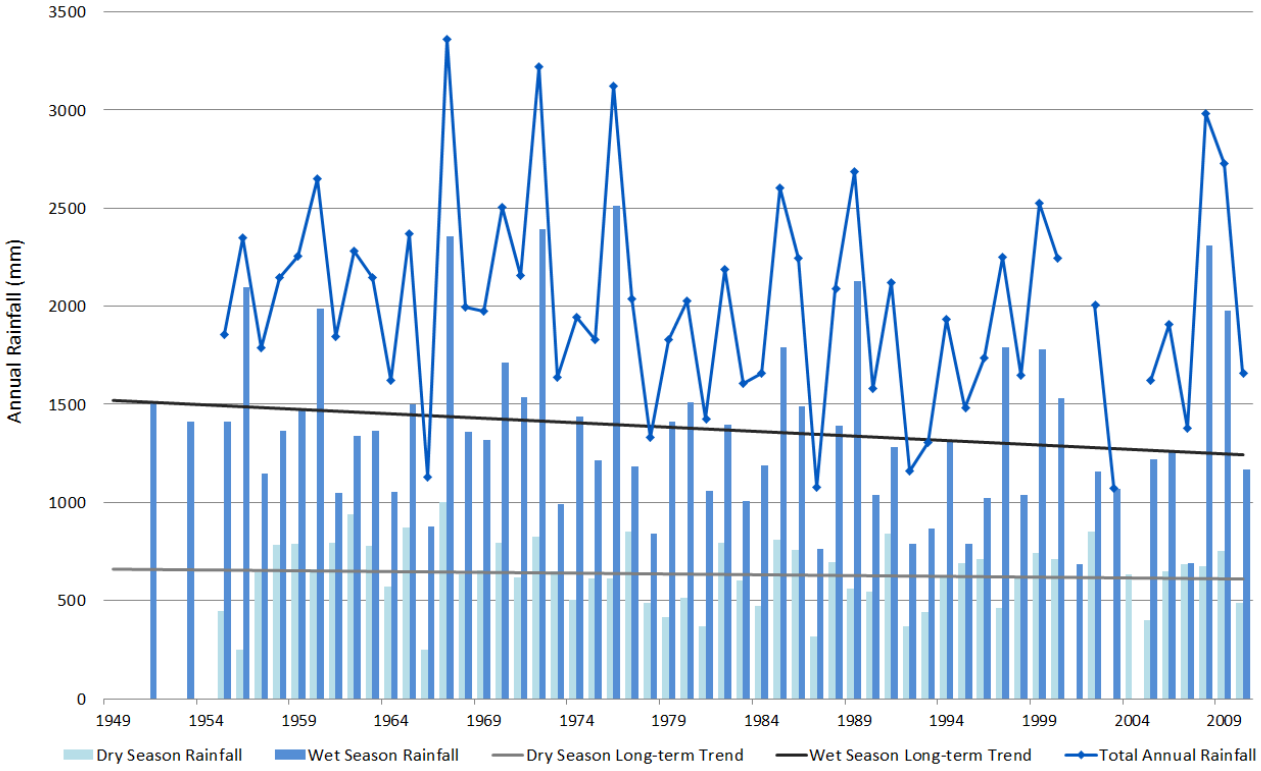

Figure 12: Honiara Long-term rainfall variability and trends by season (data sourced from SIMS)

2.3.2 EXTREME WEATHER EVENTS AND SPATIAL VARIABILITY

As a product of the city's tropical climate and the converging regional climate systems – as discussed in Section 2.3.1 – Honiara faces a range of extreme weather phenomena which have varying impact across the city.

Extreme rainfall events can lead to both localised flash flooding and severe riverine flooding as a product of the large catchment areas that lie upstream of the city. The most extreme such event on record was the April 2014 Floods, caused by peak daily rainfall of 318mm (3rd of April 2014). This extreme event resulted in the deaths of 22 people and the estimated displacement of 10,000, with over 1,000 of those displaced still housed in evacuation centres by the 25th of June (OCHA 2014). Urban infrastructure, such as roads and bridges, were impacted and homes – many of them informal – were also washed away. Access to clean drinking water was a major concern following the event for at least half of the 50,000 estimated to have been affected by the flood.

Although long-term daily rainfall records are not available for the area, modelling-based analysis suggests that this equates to more rainfall than expected in a 1-in-100 year event (Lal & Thurairajah 2011). Rainfall has also been associated with the risk of landslips in the more rugged areas of the city, as well as riverbank erosion and the spread of vector-borne diseases. Riverine flood risk areas for the April 2014 floods have been included in Figure 13, however spatial information on flash flooding hotspots and riverine flood risk areas for more frequent return periods is not available. Areas of landslip risk also require further analysis, particularly in relation to the Honiara *Local Planning Scheme,* which has placed regulatory restrictions and requirements on building sites located on gradients steeper than 45 degrees (MLHS & HCC 2015).

Most coastal areas along the northern edge of the city lack natural or artificial defences from storm surges and tropical cyclones, with those areas of the city likely to be impacted by a five metre storm surge height shown in Figure 13. Tropical cyclones are seasonally most likely to occur between November and April, with on average one cyclone passing within 400km of Honiara each year. Tropical Cyclone occurrence varies significantly year-to-year, however, ranging

from five in 1971/72 to none in other years (SIMS, BoM & CSIRO 2013). Cyclones are twice as likely to pass in close proximity to Honiara during El Niño conditions as they are during a La Niña event. Exposure to other impacts resulting from tropical cyclone events such as extreme winds are also likely to impact the coastal areas of the city, as well as the ridgeline and north-facing housing in the city's interior. Housing located on southerly-facing slopes below the ridgeline is least likely to be impacted.

Although coastal erosion risk areas are also shown in Figure 13, a more extensive area was identified in community consultations, with additional erosion evident at Kukum Fishing Village and Ontong Java Settlement. Such changes were observed to be driven by storm surge events and extreme wave action during tropical cyclones.

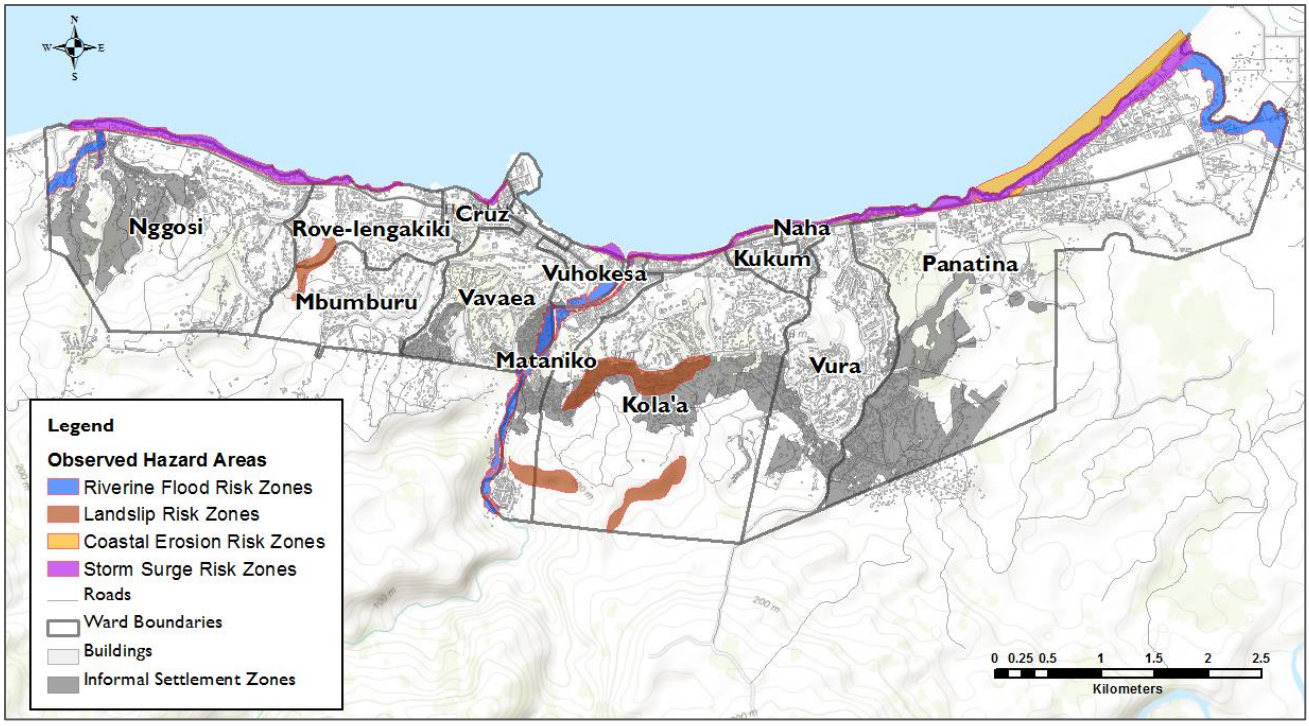

Figure 13: Identified Climate-related Hazard Areas (data sourced from MLHS, UN-Habitat and MECCDM)

Extreme heat events – particularly in the form of hot night-time temperatures – were noted by community members as having some impact on particular communities, supported by SIMS data showing a strong increase in the number of very hot day-time and night-time temperatures over the last two decades. These extreme heat conditions are worsened in high-density areas, where a lack of through-flow prevents cooling through sea breezes and natural air circulation.

Drought and coral bleaching events have historically had a secondary impact on the city by reducing the availability of food, livelihood products, and water, while also driving rural-to-urban migration. However, exposure to these events is not spatially specific to the Honiara municipal area.

2.3.3 CLIMATE TRENDS AND PROJECTED CLIMATE CHANGE

Trends in annual rainfall and average temperatures in Honiara are shown in Figure 14 and Figure 15. The overall trend in annual rainfall is not statistically significant; however, a clear warming trend is evident across mean, maximum and minimum air temperatures. Sea surface temperatures show a similar warming trend, increasing at a rate of 0.12°C per decade since the 1970s (SIMS, BoM & CSIRO 2013).

Seasonal and daily rainfall trends are not clear, although the number of rainy days experienced in Honiara has decreased slightly (3.75 less rainy days per decade). As noted in Section 2.3.2, extreme temperatures have shifted significantly, with night-time extremes showing a strong increase in unusually hot minimum temperatures, and a similar decrease in extremely cool night-time minimums.

Satellite observations of near-shore sea level rise around Guadalcanal shows an increase of more than double the global average, rising at an average rate of 8mm per year since 1993 (SIMS, BoM & CSIRO 2013 p.206).

Analysis of trends in tropical cyclone occurrence and intensity is not recommended at the country level in the Pacific.

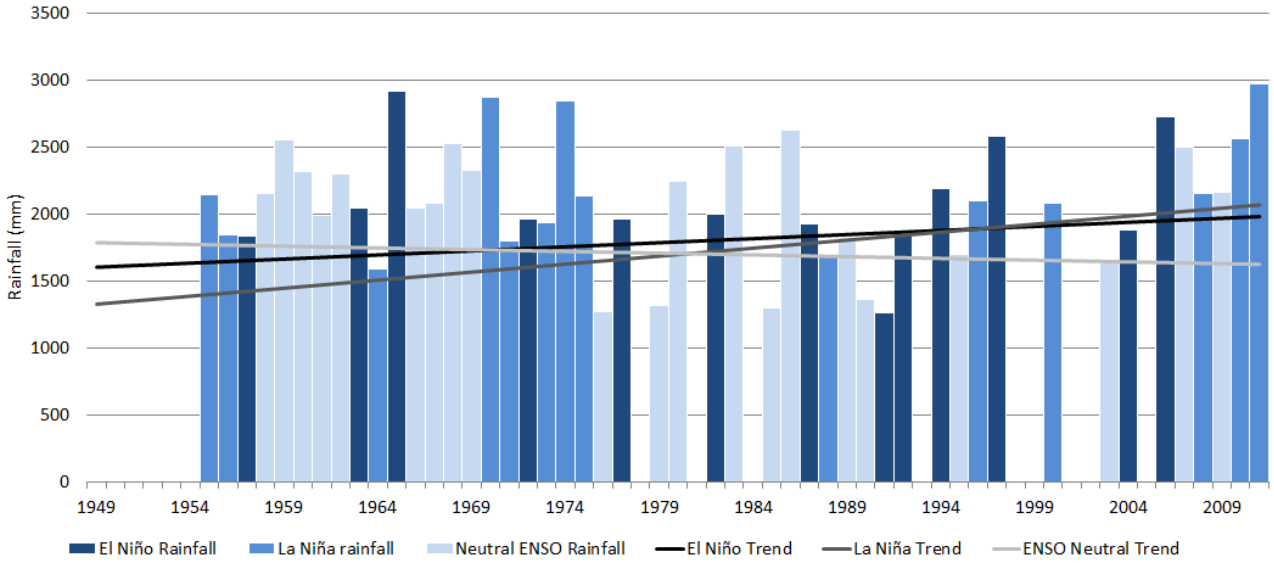

Figure 14: Long-term rainfall trends in Honiara by ENSO Status (data sourced from PACCSAP 2014)

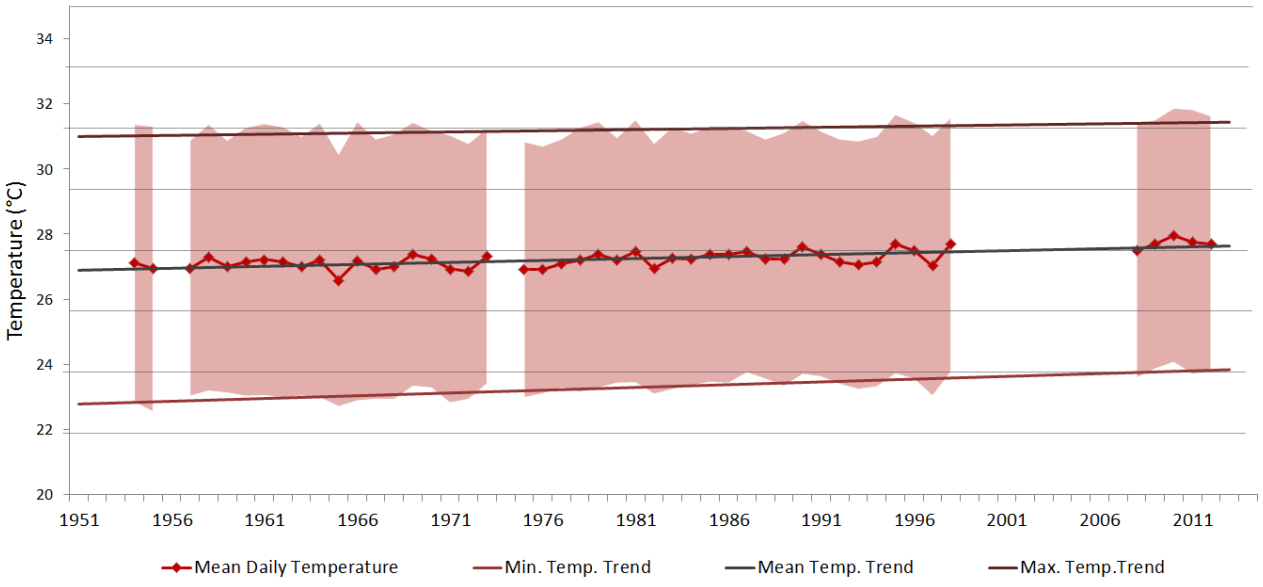

Figure 15: Long-term temperature trends, Honiara (data sourced from PACCSAP 2014)

Future climate projections are based on Representative Concentration Pathways (RCPs), which reflect different warming scenarios dependent on the level of global emissions over time. These scenarios are then applied to Global Climate Models (GCMs) resulting in a range of possible future climate projections. The agreement between these

models – as well as their consistency with the underlying science and observations – is reflected in the confidence levels that are applied as determined by the Pacific-Australian Climate Change Science and Adaptation Planning Program (comprising climate science experts from the Australian Bureau of Meteorology and the Commonwealth Science and Industry Research Organisation). The bracketed range used in the figures below shows the range of these modelled outputs (excluding outliers beyond 5-95% agreement), with change relative to a 20-year period centred around 1995.

There is very high confidence that both sea surface and air temperatures will continue to increase across the Solomon Islands. However, as shown in Figure 16 the range of this change varies increasingly with the longer-range projections, particularly for higher emissions scenarios. By 2030 annual temperatures are projected to increase by approximately 0.7°C irrespective of the emissions trajectory over the next decade and a half, while by 2090 a 'business as usual' high-emissions scenario could result in as much as a 4.0°C annual temperature increase (PACCSAP 2014).

Annual Mean Air Temperature Change	2030	2050	2070	2090
RCP 2.6 (very low emissions)	**+0.6°C** (+0.4 to +0.9°C)	**+0.8°C** (+0.6 to +1.2°C)	**+0.8°C** (+0.4 to +1.2°C)	**+0.7°C** (+0.4 to +1.2°C)
RCP 4.5 (low emissions)	**+0.7°C** (+0.4 to +1.0°C)	**+1.0°C** (+0.7 to +1.4°C)	**+1.2°C** (+0.9 to +1.8°C)	**+1.4°C** (+1.0 to +2.1°C)
RCP 6 (medium emissions)	**+0.6°C** +0.5 to +0.9°C)	**+0.9°C** (+0.7 to +1.4°C)	**+1.3°C** (+1.0 to +2.0°C)	**+1.7°C** (1.3 to +2.6°C)
RCP 8.5 (very high emissions)	**+0.7°C** (+0.5 to +1.0°C)	**+1.3°C** (+1.0 to +1.9°C)	**+2.1°C** (+1.5 to +3.0°C)	**+2.8°C** (+2.0 to +4.0°C)

Figure 16: Projected Change to Annual Mean Temperatures in the Solomon Islands (PACCSAP 2014)

Extreme temperatures are projected to increase by a similar amount, while the frequency of extreme heat days is also projected to increase, although there is low confidence in both the magnitude of the intensification and the frequency with which such days will occur.

Projected changes to annual rainfall are largely within the existing range of rainfall variability, with only low confidence that annual rainfall in the Solomon Islands will increase, due to the uncertainty around changes to regional climate systems in the area and a wide variation between model outputs (see Figure 17). Extreme rainfall events, however, are expected to increase in frequency and intensity, with a current 1-in-20 year daily rainfall event increasing by 9mm by 2030. This increases to and additional 43mm by 2090, under a worst-case, very high emissions scenario (RCP 8.5). The frequency of a current-day 1-in-20 year rainfall event – the equivalent of approximately 220mm of rainfall within a day – would increase to once every 4 years by 2090 under the same scenario (PACCSAP 2014).

Total Annual Rainfall Change	2030	2050	2070	2090
RCP 2.6 (very low emissions)	**+3%** (-1 to +8%)	**+3%** (-1 to +7%)	**+3%** (-3 to +8%)	**+4**% (-1 to +12%)
RCP 4.5 (low emissions)	**+3%** (-2 to +9%)	**+3%** (-4 to +9%)	**+4%** (-2 to +12%)	**+3%** (-4 to +10%)
RCP 6 (medium emissions)	**+4%** (-1 to +9%)	**+3%** (-3 to +8%)	**+5%** (-3 to +14%)	**+4%** (-6 to +15%)

Total Annual Rainfall Change	2030	2050	2070	2090
RCP 8.5 (very high emissions)	**+3%** (-1 to +7%)	**+3%** (-3 to +9%)	**+5%** (-3 to +14%)	**+6**% (-7 to +20%)

Figure 17: Projected Change to Annual Rainfall in the Solomon Islands (PACCSAP 2014)

There is very high confidence that ocean acidification will continue to increase, with moderate confidence that under low to very high emissions scenarios, aragonite saturation will fall below 3.4Ωa around 2040 (a critical threshold for coral health, below which reefs struggle to grow or rebuild). However, under a very low emissions scenario (RCP2.6) viable health reef conditions are likely to continue. These effects will be coupled with an increasing risk of coral bleaching events, a product of increased sea-surface temperatures. Such events are projected to increase in frequency (bleaching events that occur more than once every five years in the same location can lead to a reef area dying permanently).

Projected sea level rise is shown in Figure 18, with increases ranging significantly in the longer-term due to uncertainty regarding the contribution and speed of melting of the Antarctic ice sheet (PACCSAP 2014 p275). Inter-annual variability has historically ranged 31cm around the long-term average, and is projected to maintain a similar range as the overall average sea level increases.

Projected Sea Level Rise	2030	2050	2070	2090
RCP 2.6 (very low emissions)	**+13cm** (+8 to +18cm)	**+22cm** (+14 to +31cm)	**+32cm** (+19 to +45cm)	**+42**cm (+24 to +60cm)
RCP 4.5 (low emissions)	**+12cm** (+7 to +17cm)	**+22cm** (+14 to +31cm)	**+35cm** (+21 to +48cm)	**+47cm** (+29 to +67cm)
RCP 6 (medium emissions)	**+12cm** (+7 to +17cm)	**+22cm** (+14 to +30cm)	**+34cm** (+21 to +47cm)	**+49cm** (+30 to +69cm)
RCP 8.5 (very high emissions)	**+13cm** (+8 to +18cm)	**+25cm** (+16 to +35cm)	**+42cm** (+28 to +58cm)	**+63cm** (+40 to +89cm)

Figure 18: Projected Mean Sea Level Rise in the Solomon Islands (PACCSAP 2014)

There is low confidence in the projected change to the frequency, duration and severity of droughts that the Solomon Islands will face under climate change, although the proportion of time spent in drought is expected to remain the same or decrease slightly, as is the frequency of drought events.

Climate models are not yet effective at modelling regional changes to tropical cyclones, due to their relatively small size and short lifespan within the global climate system. At a global scale, by 2100 tropical cyclones are projected to decrease in frequency (between -6 and -35%), but increase in maximum wind intensity (+2 to +11%), with an estimated increase in rainfall by an average of 20% within 100km of the cyclone's eye (PACCSAP 2014 p.272). Within the South-West Pacific region, the change in the frequency of cyclone is similar to the global average, however with greater model disagreement.

2.4 SOCIO-ECONOMIC SENSITIVITY & CRITICAL INFRASTRUCTURE

Socio-economic measurements can be used as proxies for the likely sensitivity of different households and urban areas to certain climate impacts, with tenure, housing type, infrastructure access, health and demographics resulting in different levels of impact from climate-related hazards. For example, although the same areas may be impacted by a tropical cyclone, areas with better housing quality might be less damaged by extreme winds. Similarly, communities

which are dependent on fishing for livelihoods or income will be most sensitive to coral bleaching events that result in a depletion of fish stocks.

The initial analysis of climate sensitivity is contained in the *Honiara Climate Change Vulnerability Assessment* (UN-Habitat 2014a) but has been complemented by analysis and mapping of the 2009 National Census data at a sub-ward level across the city. Additionally, transect walks and community workshops in Kola'a, Ontong Java Settlement and Kukum Fishing Village provided further local information on climate sensitivity at the household level.

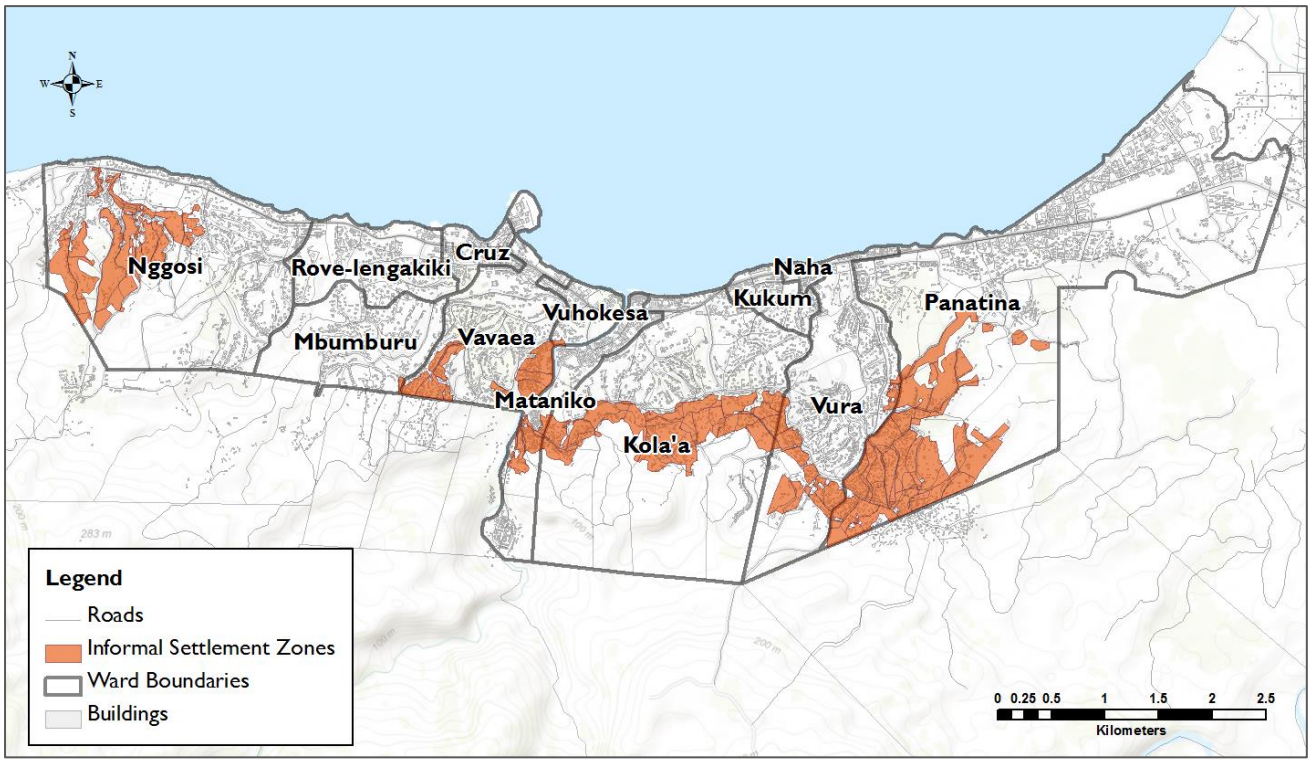

Figure 19: Informal Settlement Zones as determined by MLHS & UN-Habitat Country Team (MLHS / UNH 2014)

As can be seen in Figure 19, Informal Settlement Zones (ISZs) comprise almost 15% of the city's total land area, and contain an estimated 28% of the city's population[2]. In addition to these zones, informal housing structures can be found throughout the city on road reserves and other accessible un-populated areas, such as the national cemetery and the botanical gardens (pers. comm., HCC December 2014).

Two examples of these untenured structures are shown in Figure 20. Both are limited in terms of their structural integrity as well as being located in areas that were exposed to flooding in 2014.

[2] This figure is derived from analysing 2009 census data household spatial reference points, estimating household size by respective Enumeration Area averages. Point-specific data was not able to be accessed due to confidentiality concerns. It is noted that some areas of formal tenure may be contained within the shaded areas of Figure 19, which are intended to be illustrative only.

Figure 20: Informal housing structures outside of ITZs in Mataniko Ward (Photo Credit: Trundle)

Almost half of Panatina Ward's total population (48.6%) is contained within ISZs, while Kola'a Ward comprises a similarly large ISZ population (39.9% of its total ward constituency). 20-30% of Nggosi, Vavaea, Mataniko and Vura's populations also reside within these zones.

ISZs have a significantly higher population density than the rest of the city (52.7 residents per hectare compared with 26.8 city-wide), which increases sensitivity to extreme heat, and worsens health-related issues such as vector- and water-borne disease. Other urban areas with notably high population density are Ontong Java settlement (also known as Lord Howe Settlement) in Mataniko Ward (218 residents per hectare), and Fishing Village in Panatina Ward (112 residents per hectare), as shown in Figure 21. In both of these areas, the unplanned built form was noted to be preventing on-shore breezes from penetrating the settlements, worsening issues associated with extreme heat days that were being observed by community members (pers. comm., May 2015 consultation).

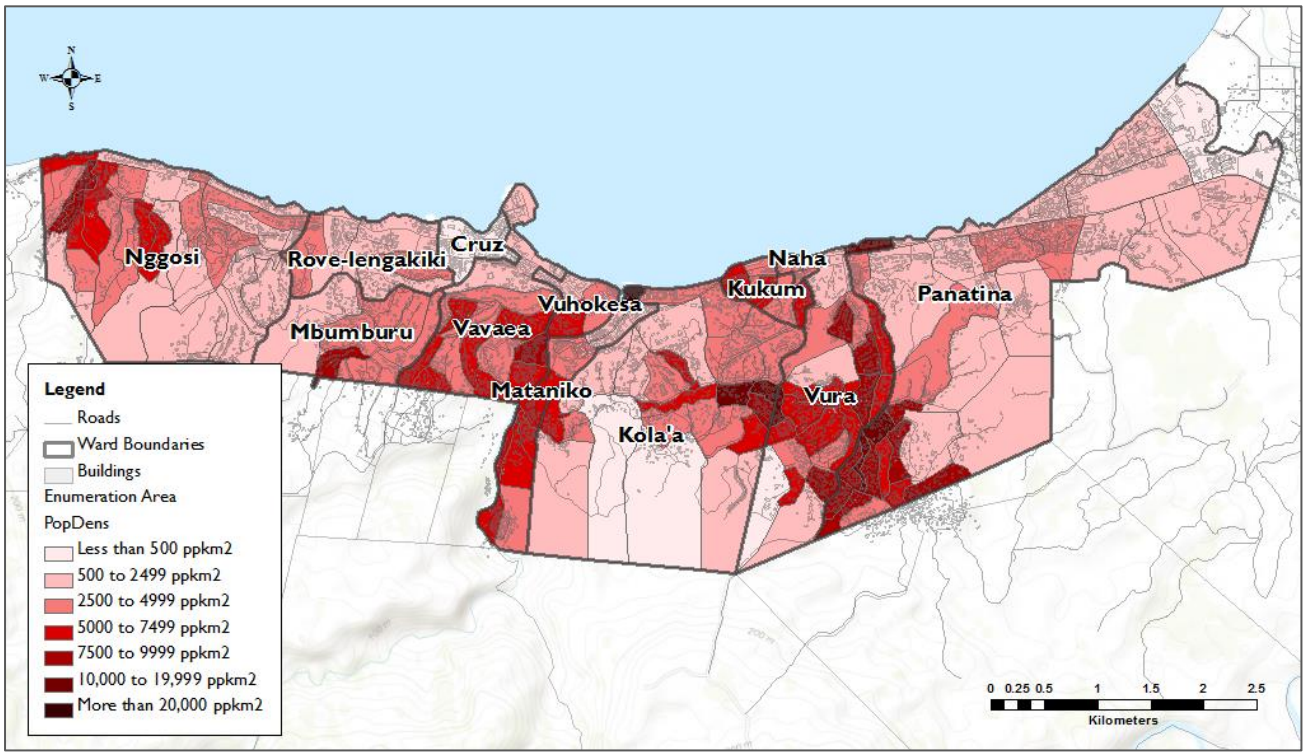

Figure 21: Population Density by Enumeration Area, 2009 (Trundle & McEvoy 2015)

A second aspect of sensitivity that cuts across multiple climate hazards is access to and quality of sanitation. This has the potential to compound the immediate impacts of flooding with the spread of disease, and can lead to underlying health conditions that also heighten sensitivity to extreme heat events. Furthermore, seepage into groundwater has the potential to put the city's water supply at risk, as well as affecting local water sources (see, for example, the natural spring water source shown in Figure 23, which is used by the majority of the surrounding community). The distribution of households which lack sealed sewerage facilities, based on 2009 data, is shown in Figure 22.

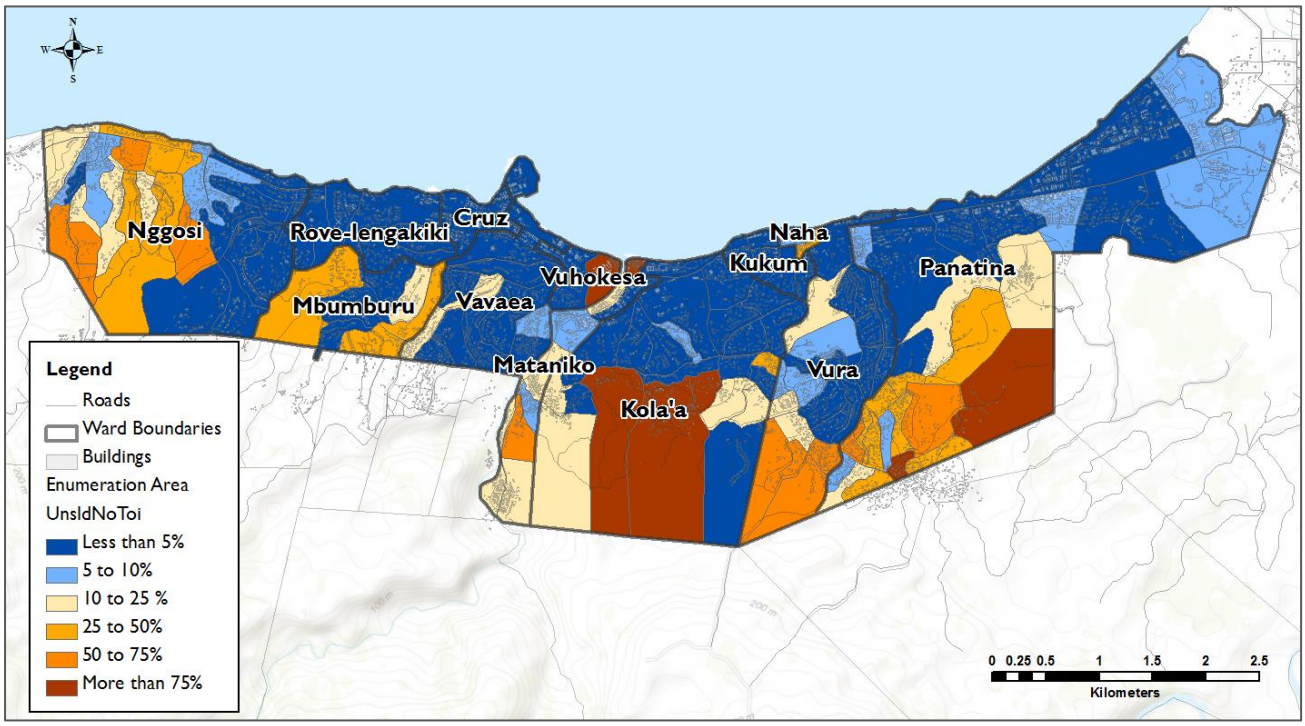

Figure 22: Households with unsealed or no sanitary/toilet facilities, 2009 (Trundle & McEvoy 2015)

Over a third of households in Vuhokesa and a similar percentage of Naha ward residents (31.5%) have either unsealed or no toilet facilities. Hotspot areas in larger wards are offset by more established, connected locations, which generally correspond to formal land tenure. City-wide, roughly 17% of households lack access to these basic sanitation services. Approximately 30% of the city is connected to the Solomon Water sewerage network (UN-Habitat 2014a p.16).

In areas lacking sealed sewerage facilities, site visits identified a number of improvised sanitation approaches. In ISZs unsealed pit toilets are commonplace, while the gravity-fed sewerage system for connected areas is noted to have consistent leakage issues, with 16 outfalls discharging directly into the ocean. Improvised facilities for washing are often located near waterways or the ocean, such as the kitchen area and communal shower/washing site shown in Figure 23. In coastal zones, community members were identified as washing in the ocean and were also observed washing kitchen items and clothing in waterways.

Figure 23: (L) Informal secondary water connection (C) Kitchen Facilities in Kola'a (R) Natural Spring for Washing

One quarter of households across the city lack formal metered access to potable drinking water, although as shown above, unauthorised secondary water connections are commonplace particularly within ISZs. Panatina and Rover-Lengakiki Wards have the lowest levels of potable water access (63.6% and 68.9% respectively), with the distribution of metered water access across the city shown in Figure 24. The city's official water supply is sourced from a combination of groundwater sources and freshwater springs, located within or adjacent to the city boundary, with the city's main water supply located upstream of Nggosi ward within the White River catchment (Kongulai Spring).

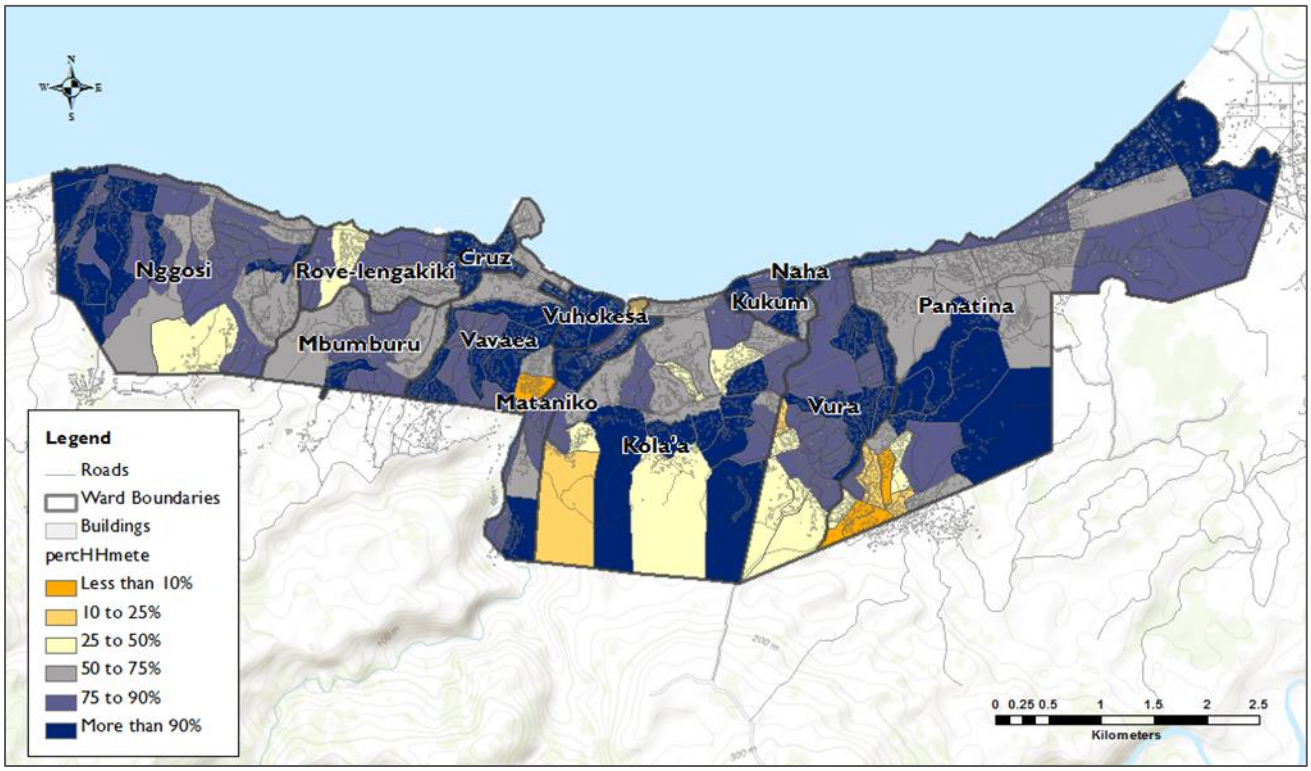

Figure 24: Households with Access to Metered Water, 2009 (Trundle & McEvoy 2015)

Access to the SIEA electricity grid follows a similar pattern across the city, shown in Figure 25, with the exception of significantly lower access rates in Nggosi Ward (53.6%). Vuhokesa ward recorded the lowest rate of SIEA connections

per household (48.0%), while Kola'a, Panatina and Vavaea all fell within the 55-65% electricity access range. It was noted during site analysis that housing constructed with traditional materials were not permitted to be connected to the grid, limiting access to some customary sites along the Mataniko River, as well as a number of informal settlements. In total roughly two-thirds of households in Honiara have electricity access, although a number of off-grid houses were observed to be using small solar panels to generate power for devices such as mobile phones.

The city's power supply is heavily dependent on imported diesel, which, combined with transport fuel, accounts for roughly 30% of the country's goods imports by cost, and 80% of SIEA's expenditure (MMERE 2014). Based on 2013 figures Honiara's power supply consumes an estimated 16.2 million litres of diesel annually. Port access and diesel storage in Cruz, as well as the continuing operation of the city's two power stations, is therefore critical following an extreme weather event.

As noted in the Honiara Vulnerability Assessment, previous tropical cyclone events have brought down power lines, resulting in power outages. A one-megawatt photovoltaic rooftop array supplements the diesel generators, with back-up generators located at most government ministries and other key infrastructure facilities. A number of small-scale hydro stations are also currently being refurbished, and are due to return to operation in 2016.

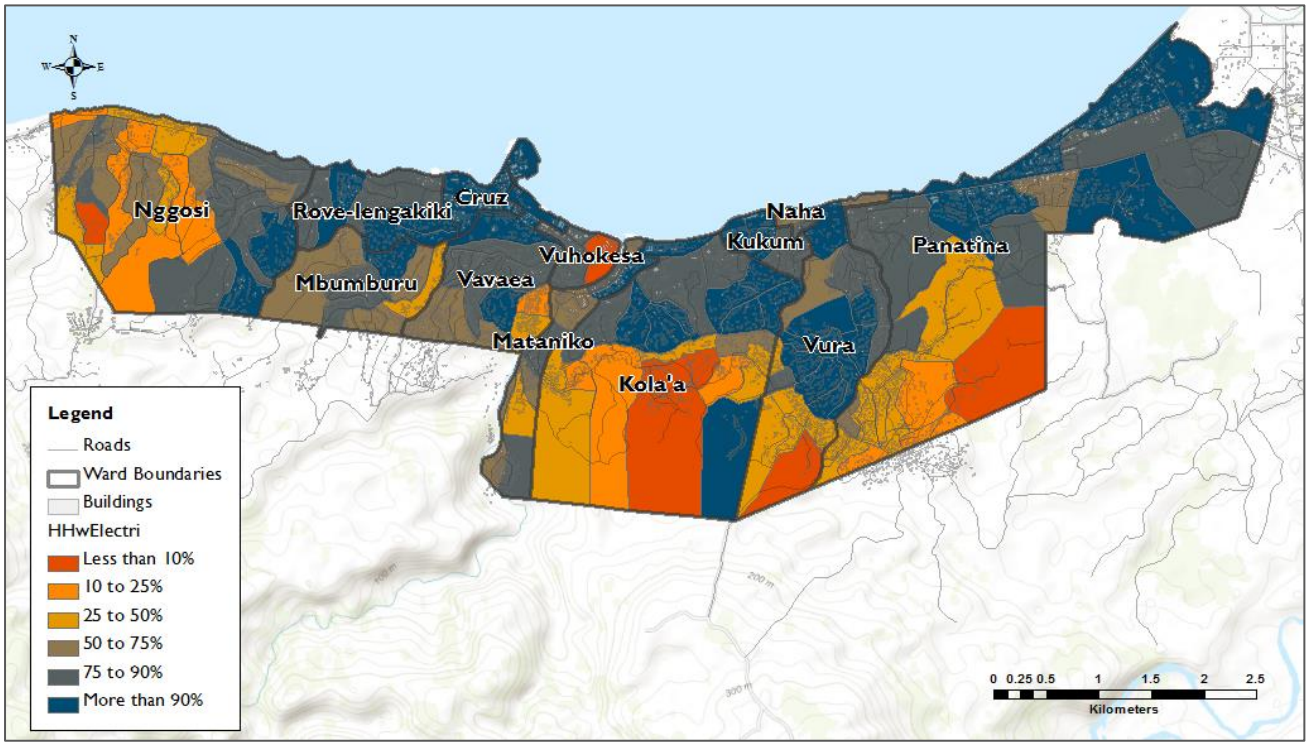

Figure 25: Households with Access to Electricity, 2009 (Trundle & McEvoy 2015)

Makeshift and improvised roofing increases sensitivity to tropical cyclone, extreme wind and flood events, with poorly constructed housing structures along the Mataniko River collapsing during the 2014 floods; resulting in large debris that damaged downstream infrastructure. Poor quality roofing can also lead to heightened risk in extreme heat, reducing shading of walls and insulation of inside spaces. As can be seen in Figure 26 these houses are concentrated in ISZs, where a lack of formal tenure was noted to prevent investment in stronger housing designs and materials.

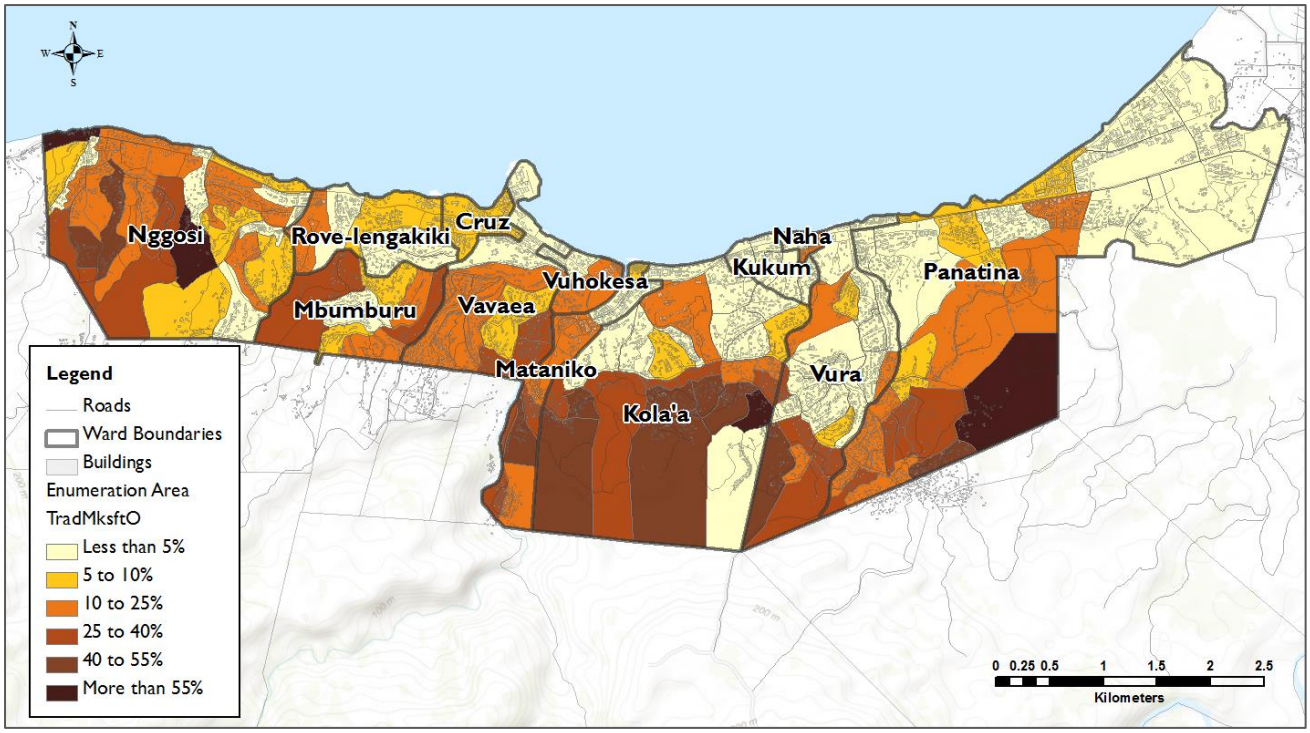

Figure 26: Households with Makeshift, Improvised or Traditional Roofing by EA, 2009 (Trundle & McEvoy 2015)

2.4 ADAPTIVE CAPACITY: INSTITUTIONS, POLICY AND COMMUNITY STRUCTURES

Adaptive capacity is a measure of the resources, institutional and community structures, and knowledge networks and skills that are able to be used or activated in response to a shock or long-term stress. Adaptive capacity counteracts the heightened vulnerability resulting from exposure and sensitivity, and can be similarly considered in terms of spatial variation within the city, as well as across the city as a whole. Adaptive capacity can be categorised as being:

- **Autonomous**, where there is no targeted response to climate stimuli, but gradual market, ecological and behavioural shifts that occur spontaneously over time;
- **Collective**, whereby households, groups and community organisations work with their own social structures and *kastom* networks; and
- **Institutional**, which refers to formal governance arrangements, policies and capacity.

A rapid assessment of city-wide adaptive capacity was conducted by a series of stakeholder groups in 2015, including the Honiara City Council, Solomon Water, the National Disaster Management Office, as well as youth and NGO representatives, and hotspot communities. The outcomes of this are shown in Figure 27, and supplement the outcomes of the 2012 city consultation workshop, which provided the baseline for assessing adaptive capacity in the Honiara Vulnerability Assessment (UN-Habitat 2014a p.15).

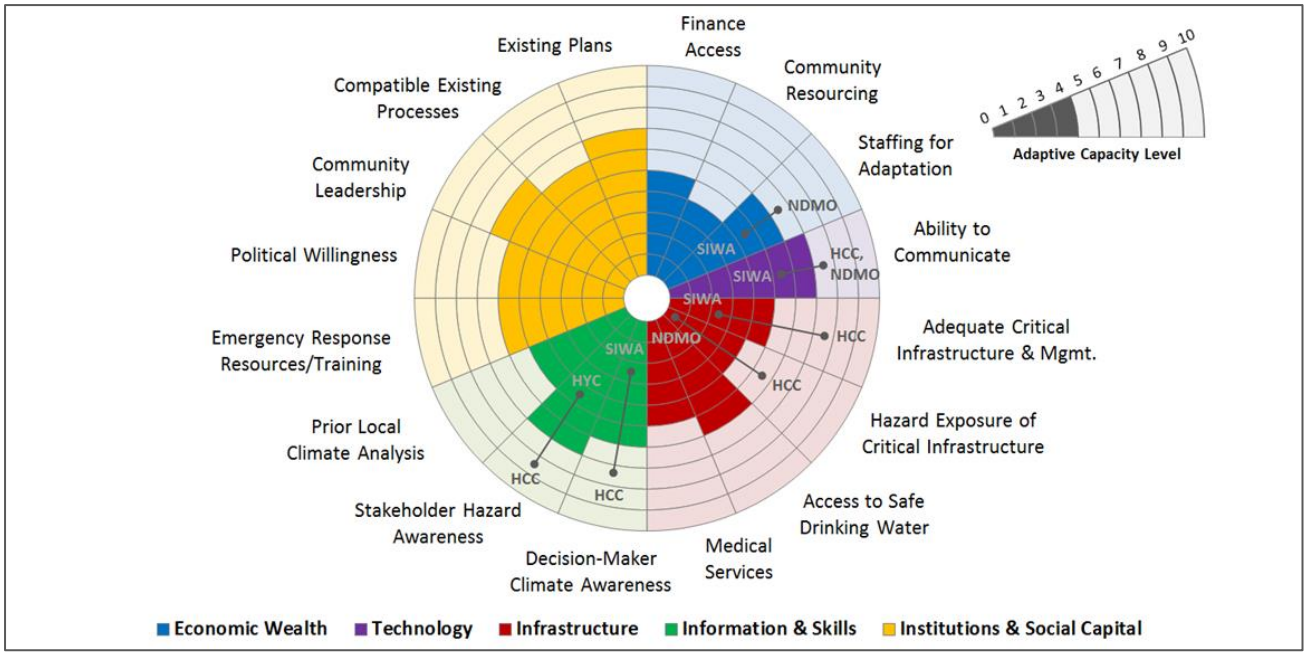

Figure 27: Adaptive Capacity Assessment by Workshop Participants, May 2015

Access to finance is an issue at both community and household levels, as well as across national government agencies. As noted in the PCRAFI Disaster Risk Financing and Insurance Country Note, disaster relief through the National Disaster Council has a limited national budgetary allocation (US$305,250 in 2013), which has a 77 percent chance of being exceeded in a given year. This results in heavy dependency on international recovery funds and limits preparatory and preventative actions (World Bank 2015b). At a household level, 32% of the population fall below the Basic Needs Poverty Line (UN-Habitat 2014a p.15). These results are consistent with the 2012 workshop findings that access to finance is both a critical limitation to city wide adaptive capacity, as well as resourcing community and household-level resilience building measures.

Similarly, the vulnerability of critical infrastructure to climate-related events – such as cross-city bridges, the National Referral Hospital, and Honiara International Airport – was viewed as seriously limiting institutional responses following a natural disaster event such as a tropical cyclone. The lack of effective back-up electricity generators for mobile phone communications was also identified as an area of critical response infrastructure that would have a knock-on effect in reducing collective adaptive capacity.

Important components of city-wide adaptive capacity are related to the ability to communicate (both in terms of formal institutional communication procedures, and collective social response measures), and stakeholder and community awareness of climate-related natural hazards. Existing community leadership structures, particularly through *kastom* networks and ward-level committees, were identified as being effective following historical disaster events, with a number of the residents displaced due to the April 2014 floods being quickly re-housed through kinship networks, families and church groups.

Although the number of existing strategies and plans was seen as being a city-wide strength, the implementation, effectiveness, and awareness of these documents in both key government agencies and the community as a whole was noted to be limiting. Other areas, such as the awareness of decision-makers of climate change and the adequacy of critical infrastructure, were inconsistently assessed by different stakeholder groups (as shown in grey in Figure 27), suggesting that improved communication between agencies could directly enhance Honiara's institutional adaptive capacity across levels of government, stakeholders and non-government actors.

The impact of the 2014 floods also emphasised the need for effective Disaster Risk Reduction (DRR) actions, not only in terms of responses such as evacuation but also institutional and community preparedness (land use planning, hazard zoning and enforcement, adequate drainage systems, communication of risks etc.). To assess its preparedness for future disasters, HCC invited ICLEI and UNISDR to facilitate a workshop in March 2016 using the UNISDR's Local Government Self-Assessment process (LGSA) for Disaster Risk Reduction to assess preparedness and to articulate a basis on which to develop future disaster risk reduction plans (UNISDR/ICLEI 2016). Findings from the workshop indicated that there were strong community connections that could be called upon and that DRR training is delivered in some communities by the NDMO, as well as NGOs. It was also felt that the new Local Planning Scheme could limit inappropriate development in high risk areas and that the current review of the National Disaster Management Plan provides a good opportunity for HCC to engage with the national level to develop their own plan. However, it was also noted that there is a lack of a formal structure in HCC for DRR, and a lack of clarity of roles and responsibilities within HCC (and between agencies), and coordination and cooperation between agencies and with the community on DRR is perceived to be poor.

As with sensitivity and exposure, adaptive capacity varies significantly across the city. Informal settlements, as outlined in Section 2.4, lack many of the institutional support structures available to households with tenure; however they have strong community networks that contribute to collective adaptive capacity strength. Other factors, such as communications access, similarly correspond to access to utilities and other institutions. For instance mobile phone access, shown in Figure 28, correlates closely to informal neighbourhoods and other sensitive locations.

In contrast, measures of access to luxury services, such as wired internet access, can demonstrate sections of the community with a high level of adaptive capacity, both directly in terms of the ability to autonomously respond and self-finance, and indirectly through access to institutional response mechanisms such as government websites and international networks. Although internet connectivity across the city was generally very low at the last census, localities with concentrations of higher income households can be seen in Figure 29, with the south-eastern hillside areas of Nggosi, central Kola'a above Chinatown, and Cruz exhibiting these characteristics.

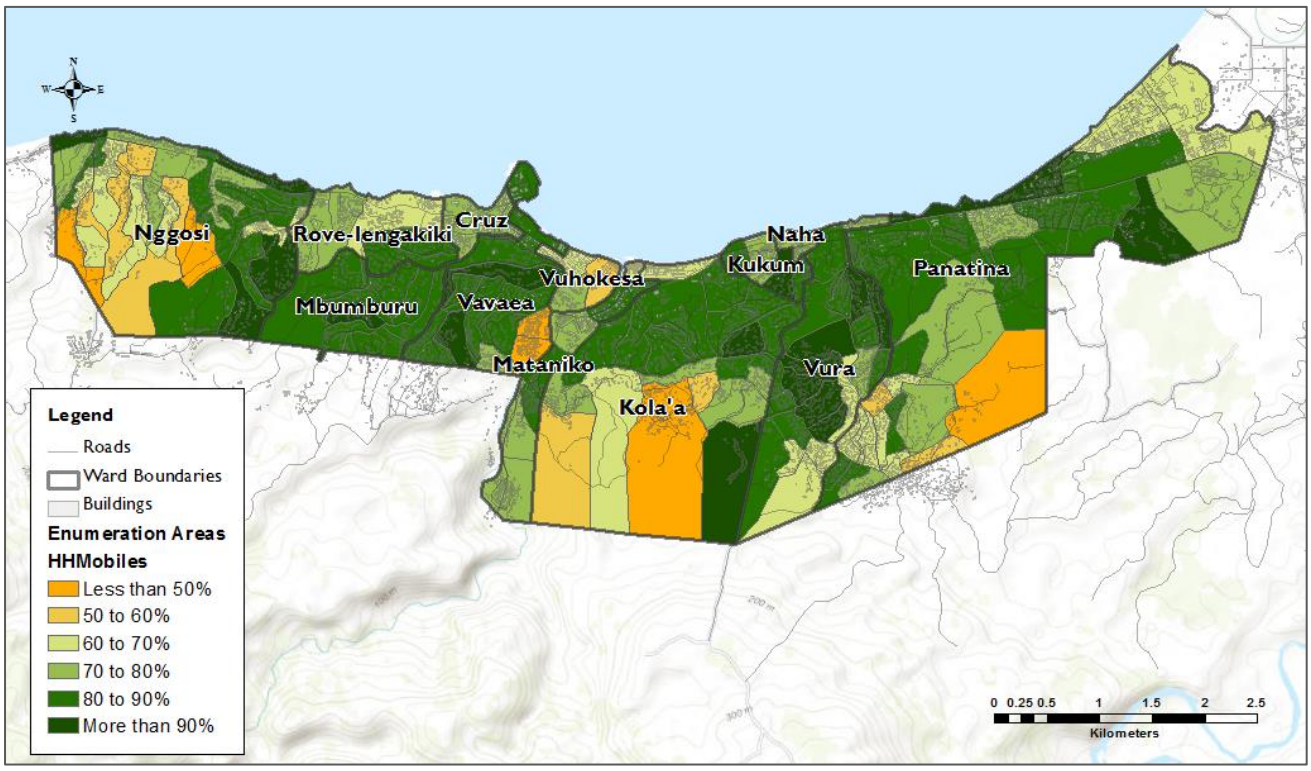

Figure 28: Household mobile phone ownership rates by Enumeration Area, 2009 (Trundle & McEvoy 2015)

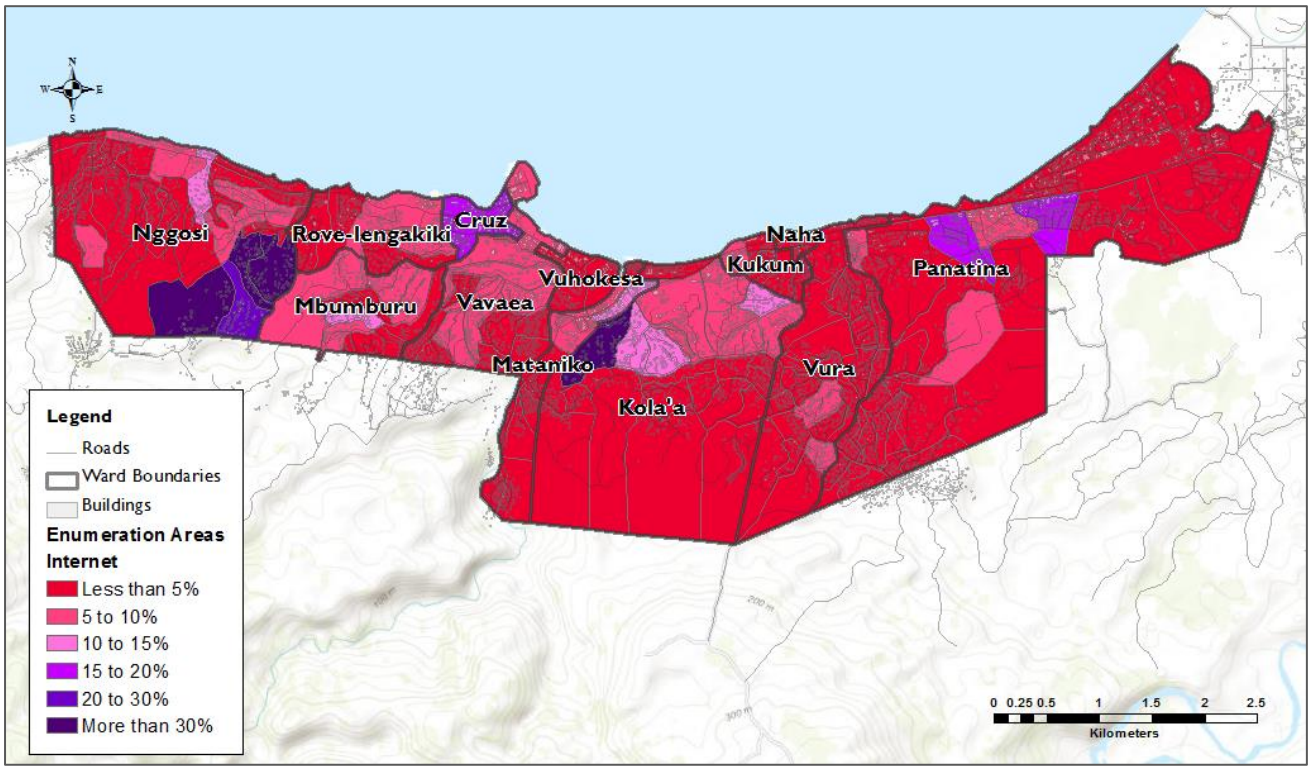

Figure 29: Internet-connected Households by Enumeration Area, 2009 (Trundle & McEvoy 2015)

2.6 VULNERABILITY HOTSPOTS

In order to identify those communities and sectors most vulnerable to climate impacts, a Vulnerability Hotspot Model was developed integrating the features described in both the original Honiara Vulnerability Assessment and the additional variables outlined in this HURCAP (Figure 30).

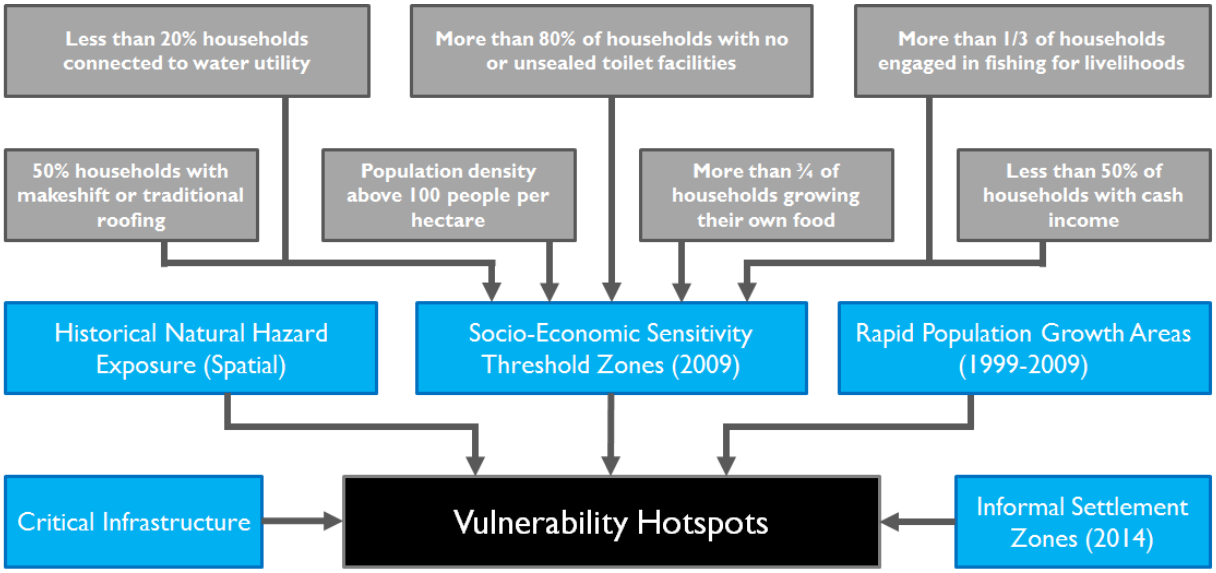

Figure 30: Vulnerability Hotspot – Model Structure & Inputs

Thresholds for enumeration-area classification were determined for seven of the 2009 census variables which were seen as critical for socio-economic sensitivity to climate impacts. These seven variables were overlayed, and areas with one or more thresholds passed were then highlighted. Localities that grew at a rate of 15% or above per annum over the previous decade were taken into account, in addition to the overcrowding issues identified in high-density zones, informal settlement zones, and critical infrastructure. The outputs of this integrated analysis are shown in Figure 31.

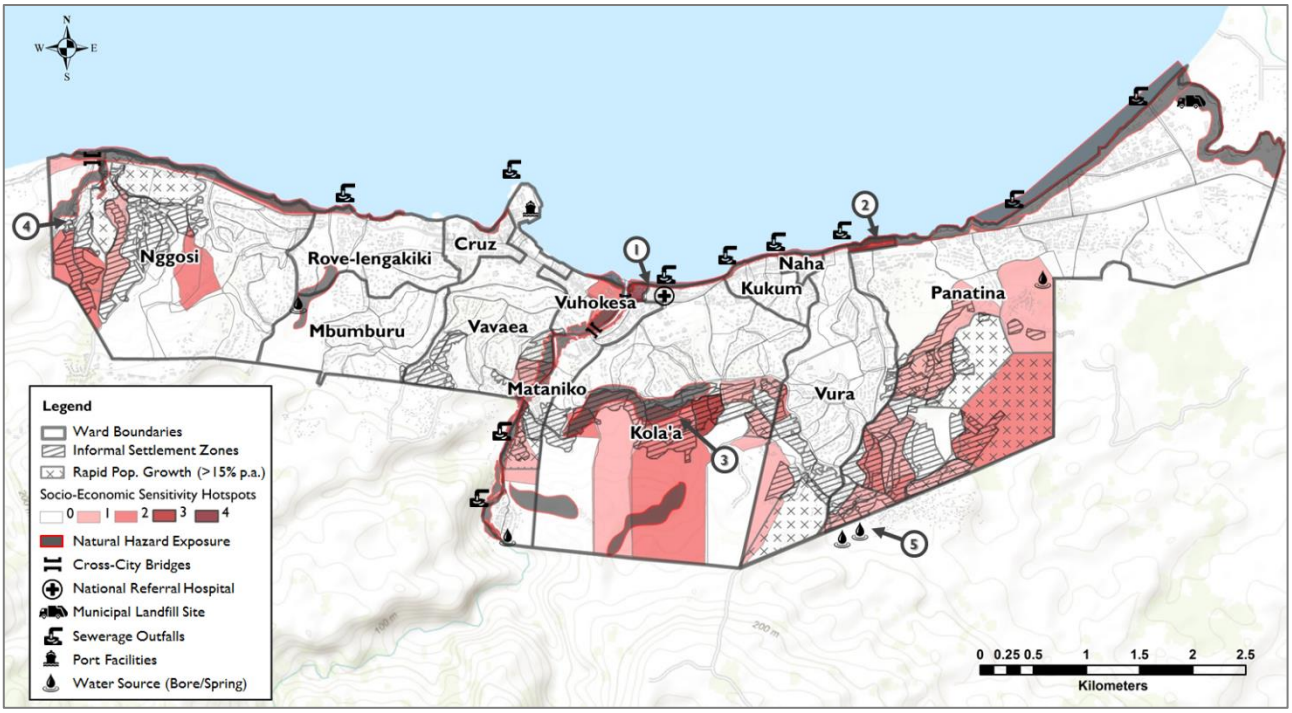

Figure 31: Vulnerability Hotspots across Honiara

2.6.1 COMMUNITY VULNERABILITY HOTSPOTS

As a consequence of the April 2014 floods the Honiara Vulnerability Assessment hotspot communities were reviewed, with the previously identified sites subject to site visits and community consultation sessions. However, the destruction of the Koa Hill housing area meant that this community was omitted from the assessment. On the basis of the vulnerability hotspot model shown above, two additional areas were also identified, as can be seen in Figure 31; these are recommended for follow-up site visits, profiling, and analysis.

Ontong Java Settlement (1), also referred to as Lord Howe Settlement, remains one of the highest priority hotspot areas, being located at the mouth of the Mataniko River and 0.5 metres below the current high-water mark. The community faces additional hazards such as heavily polluted internal drainage systems, overpopulated high density housing, and a lack of basic sanitation and proximity to sewerage outfalls from the National Referral Hospital (which has limited waste treatment capabilities). Saline water-logging was preventing planting of gardens within the community, as well as the digging of pit-latrines. Extreme night-time temperatures were also identified as being an issue, with sea-breezes prevented from penetrating into the settlement due to overcrowding.

Kukum Fishing Village (2), is located in Vura Ward adjacent to the Kukum highway along a thin strip of coastline that has been heavily eroded in past cyclone events. The dependence on fisheries for livelihoods further heightens the community's vulnerability to the marine impacts of climate change, while the community experiences similar issues to Ontong Java Settlement with a neighbouring sewerage outfall polluting the local environment. Health risks associated with water pollution and poor rubbish collection services were also noted by community members, which were worsened by the high population density and overcrowding in the area.

The **Aekafo Planning Area (3)** in Kola'a Ward includes the two ISZs of Matariu and Jericho; hotspots highlighted in the Honiara Vulnerability Assessment. This area has limited road access and no formal connection to utilities and services, resulting in severe pollution along the riverine valley and significant risk from disease due to a lack of basic sanitation (see Figure 23 in Section 2.4, and Figure 32 below). A large portion of the area is also potentially at risk of landslip, with houses built without formal approval or under TOLs, resulting in variable structural quality, and little to no government regulation (see Figure 33).

Figure 32: Pollution in the riverbed Vara Creek, Aekafo Planning Area, December 2014 (Photo: Trundle)

Figure 33: Kola'a ISZ topography (L) & example of housing responses (R) (Photo: Trundle)

The two additional vulnerability hotspots identified through socio-economic analysis and hazard mapping are located in rapid growth Informal Settlement Zones, adjacent to Honiara's municipal boundaries. The **White River (4)** area along Nggosi Ward's western boundary grew rapidly in the decade preceding the 2009 census, and has limited electricity and sanitation access (although the proximity to a natural spring water source upstream of White River has resulted in

higher than average metered water connectivity). Limited mobile phone access and a significant presence of makeshift or traditional housing types suggest that further investigation of this locality is warranted.

Similarly, the rapid cross-border population growth observed along Panatina Ward's southern boundary suggests that **Mamulele & Kombito 2 & 3 (Hotspot 5)** also meet the criteria of vulnerability hotspots, and require further on-the-ground analysis and engagement. These areas have very low metered water and electricity access, high levels of makeshift or traditional housing materials, and a housing density above 75 persons per hectare. These housing areas are also rapidly encroaching on the catchment areas around the Kombito water source, with the adjacent boreholes and spring water site as shown in Figure 31.

2.6.2 CRITICAL INFRASTRUCTURE & SECTORS

In addition to housing and household-level issues, critical components of the city's infrastructure are also heightening Honiara's vulnerability to current day climate-related events, many of which will be worsened by climate change. The potential impact of critical infrastructure failure was highlighted during the April 2014 floods, where damage to the city's main through road and bridges across the Mataniko River severely reduced cross-city access. The locations of the critical infrastructure assets most vulnerable to climate impacts are shown in Figure 31. Infrastructure 'deficits' were also confirmed by the Honiara City Council Disaster Risk Reduction Self-Assessment workshop (UNISDR / ICLEI 2016), which highlighted that critical infrastructure, schools, and health facilities are not designed to cope with extreme events, and the maintenance of public infrastructure is poor. In addition, building codes do not necessarily integrate disaster risk, and need to be better enforced.

Although not a spatial hotspot as such, the **lack of sanitation** across the city heightens the vulnerability of the city to climate impacts, with flooding, health issues and the use of urban springs and water sources for washing, drinking and garden irrigation interacting with effluent and other pollution. As shown in Figure 23 earlier in this Action Plan, the close proximity of poorly-maintained sewer outfalls to settlements, waterways and the city's heavily-used coastline limit any reduction in these risks even in those areas where sanitation is prevalent. During fieldwork, effluent from pumped septic systems was observed being deposited into the city's landfill site without treatment (see Figure 34). Waterway pollution and debris throughout the city present a more general risk to downstream infrastructure and inhabitants.

Figure 34: Septic tank collection truck pumping effluent into the Honiara Landfill (Photo: Trundle)

The **Ranadi Landfill Site** is on the city's eastern border with Guadalcanal Province, in an area prone to coastal erosion and riverine flooding, and potentially exposed to severe storm surges. The existing site has limited protection and is likely to be leaching chemical products, hazardous waste, and septic effluent into the soil and waterways that surround it. Healthcare waste is burned in an open pit at the site, as neither the National Hospital nor the Landfill has an incinerator. Although remediation of the Ranadi site is currently underway, an alternative site will also be needed in the near future due to limited capacity to collect the estimated 29,000 tons of waste generated in Honiara annually, an estimated 40-50% of which is organic (ADB 2014). The 75% of waste that is not currently collected by HCC is largely burnt or dumped in waterways, with incentive-based recycling schemes operating for aluminium cans and glass bottles.

The **National Referral Hospital** is critical to post-disaster response, but is heavily exposed to climate impacts due to its low-lying coastal location. Emergency access is also heavily affected by road congestion along the Kukum Highway/Mendana Avenue. The process of relocating the hospital is currently underway, with exposure to climate hazards – both of the site and its access routes – being considered in the site selection process. The sewage outfall that is adjacent to both the hospital and the Ontong Java Settlement exacerbates the hotspot's impact on surrounding settlements.

Inconsistent availability and a general lack of household access to the city's **electricity supply** presents a vulnerability both at a household level and within government departments during an emergency response, with back-up generators at government departments dependent on the same diesel fuel supplies as the city's two power stations. Failure to stockpile sufficient diesel supplies, if coupled with disruptions to shipping or port access, could therefore have catastrophic implications for the city's economy, government services, and communications. Short-term power disruptions have flow-on impacts to the city's **services sector**, which provides the bulk of non-government employment and wage-based income.

Honiara International Airport is located to the east of the municipal zone and acts as the key entry point for tourist visitors (approximately 5,500 annually), around half of which are Australians (SINSO 2015). The industry is driven by diving sites, particularly the World War II wrecks located offshore of Honiara in Ironbottom Sound. However, reef diving and ecotourism is a growing sector that will itself be vulnerable to climate impacts. The airport is located alongside the flood zone of the Lunga River and is also potentially exposed to inundation and damage from severe storm surges (UN-Habitat 2014a).

The location of the national **Honiara Port Facilities** within the central CBD, as well as the city's main fuel depot (see Figure 35), contributes additional congestion to the city's main road, with much of Honiara's imported goods requiring transport to the Ranadi industrial area. Proposals to rehabilitate Point Cruz and provide public open space along the shoreline are contained within the *Honiara Local Planning Scheme 2015* (a lack of open space and public access to the coast were highlighted by workshop and forum participants).

Mendana Avenue/Kukum Highway is currently at capacity with average vehicle speeds reducing to below 10kmph past the **Honiara Central Market** (JICA 2014), worsened by the four-lane arterial road reducing to two lanes across the mouth of the Mataniko River. Projects are currently underway to duplicate the Mataniko River Bridge, with investigative studies looking at the possibility of a CBD bypass road further inland (MLHS & HCC 2015).

Schools and educational facilities across the city were employed as evacuation centres during the April 2014 floods, however the role of schools as critical evacuation facilities during disaster response was viewed by many stakeholders as having a negative impact – in terms of education disruption and facilities damage – rather than an asset. Deployment of alternative forms of evacuation centre facilities is discussed in the planning component of this Action Plan.

Additional critical infrastructure components and sectors are set out in more detail in the 2014 Honiara Vulnerability Assessment Report (UN-Habitat 2014a).

Figure 35: View of the Point Cruz Port Facilities and Fuel Depot (Photo: Trundle)

3. CITY-WIDE ADAPTATION & URBAN RESILIENCE OBJECTIVES

3.1 FROM ISSUES TO OBJECTIVES

Climate adaptation and urban resilience objectives were developed through a participatory workshop series conducted in May 2014, which engaged a broad cross-section of government stakeholders and committees, civil society organisations, youth, and community members in each of the identified vulnerability hotspots[3]. In total over 180 individual stakeholders were directly involved in objective-setting and planning activities, representing a broad cross-section of the community, government decision-makers, and non-government organisations. Project activities included training of 15 NDMO personnel, the participation of 21 youth representatives, and engagement with five donor organizations, nine local NGOs, and four national government departments. Five councillors and ten local government department heads also took part in the HCC workshop. Despite efforts to ensure equal gender representation, women represented only 26% of the stakeholders engaged, but accounted for 35% of the hotspot community participants. It is recommended that resilience activities engage explicitly with women's groups in early phases of development to rectify this imbalance.

Following a presentation on the climate change vulnerability of Honiara, as well as discussion regarding the local vulnerabilities that the relevant stakeholders or community have experienced, workshops were split into break-out groups that were directed to transform their key issues into high-level objectives. Actions that could assist in achieving each of these objectives were then identified and prioritised. Examples of the breakout activities being conducted are shown in Figure 36 below.

Figure 36: Objective Identification Workshops: NDMO (L) & Kola'a ISZ (R) (Photo Credit: Trundle & McEvoy)

Discussions of said issues were heavily focused on waste and water management, as well as the underlying pressure of rapid urbanisation and population growth (as outlined in Section 2.1). Although not all of these issues were directly climate-related, it was noted that the impacts of the April 2014 floods had been significantly worsened by upstream debris. Furthermore, plastic pollution in waterways exacerbated localised flooding by preventing the drainage system from functioning properly. Similarly, a lack of land tenure prevented regulation of building quality and controls, leading to heightened sensitivity to climate impacts and development in hazard-exposed zones, while population pressures in high density zones were suggested to worsen the potential for community violence. A visualisation of the main community and stakeholder issues is shown in Figure 37.

Although not always cited as an 'issue', a lack of understanding of which issues were driven or amplified by anthropogenic climate change, and which issues were directly attributable to local human intervention (or,

[3] Due to the destruction of the Koa Hill informal settlement through the April 2014 Floods, only Kukum Fishing Village, Ontong Java/Lord Howe Settlement and the Kola'a ISZ groups were able to participate in this activity.

alternatively, existing climate variability or geo-hazards) was acknowledged to be problematic. For instance, increasing occurrence of localised flooding was attributed to climate change by some participants, despite no clear trend in rainfall events being present (see Section 2.4). Correct attribution to more likely causes – drainage systems blocked by plastic rubbish, the presence of informal settlements in at risk areas, and deforestation upstream – can empower the local population by demonstrating that local actions to counter these causes are possible, in contrast to reducing global emissions for which Honiara has minimal responsibility and limited capacity to influence. Other issues, such as community violence, were not immediately attributed as being linked to climate change; this is not necessarily the case. For instance, extreme heat conditions have been shown to result in increased levels of domestic violence in the United States (Doherty & Clayton 2011).

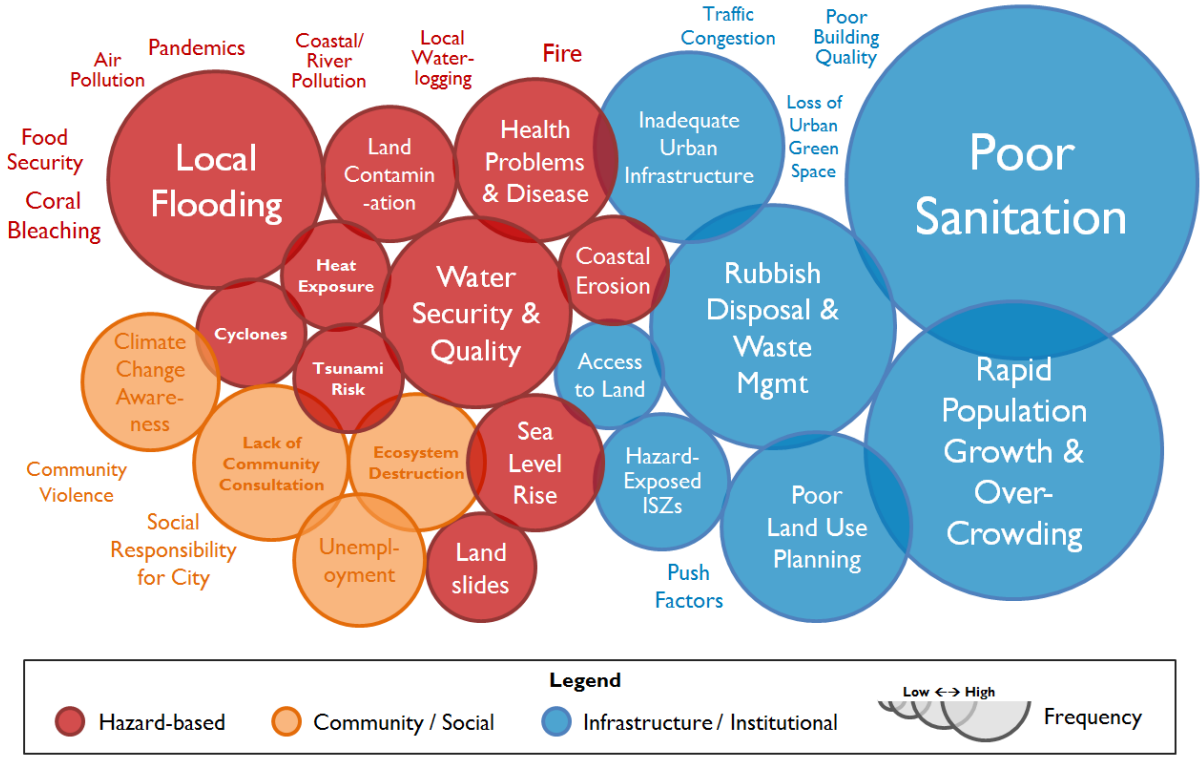

Figure 37: Issue Identification by Stakeholders by break-out group frequency & category

3.2 OBJECTIVE CATEGORIES

Objectives were developed by each break-out group on the basis of the issues that they identified, and subsequently grouped and categorised by the project team. Ten thematic areas emerged from the participatory approach:

1. **Urban Planning & Land Development**
2. **Housing**
3. **Infrastructure**
4. **Water, Sanitation and Waste**
5. **Ecosystem Services and Coastal Processes**
6. **Human Health and Well-being**
7. **Communication: Awareness and Education**
8. **Livelihoods and Behaviour Change**
9. **Disaster Preparedness and Response**
10. **Governance and Partnerships**

These objective categories contain up to nine individual high-level objectives, which form the basis of the actions set out in this Urban Resilience and Climate Action Plan (Section 4). The proposed lead organisation(s) – as well as potential implementation partners for the initiative – are listed in the tables below, as well as the strength of the link between

the objective and the city's exposure to current climate variability and projected climate change (four ticks representing the strongest link to both current and projected climate impacts).

3.2.1 URBAN PLANNING AND LAND DEVELOPMENT OBJECTIVES

1. Urban Planning and Land Development	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
1.1 Adequate land supply and land release strategy	✓✓✓✓	**Land Board**, HCC**,** MLHS, MID, MECCDM, MHMS, Chiefs, Chinese Assn, WDCs, GPG
1.2 Reduction in informal settlements	✓✓✓✓	**MLHS**, UN-Habitat, Chiefs, WDCs, CDCs, Land Board
1.3 Effective land use planning scheme	✓✓✓✓	**MLHS**, Police Force, HCC, MID, SIEA, SIWA
1.4 Zoning of landslide and flood-prone areas	✓✓✓✓	**HCC**, MLHS, WB-REP, Chiefs, Elders, MID, WHO
1.5 Protection of water easements and catchment areas	✓✓✓✓	**SIWA**, MLHS, HCC, MECCDM, Community Leaders, MID
1.6 Relocation strategy for at-risk households	✓✓✓✓	**MLHS**, Land Board, HCC, SIRC, MHA
1.7 Reduced water-logging	✓✓✓✓	**MID**, MLHS, HCC, I/NGOs

Figure 38: City-wide HURCAP Objectives – Urban Planning and Land Development

As noted in the updated Honiara Local Planning Scheme (2015), although a number of plans for the city have been set out since the declaration of the current Honiara town boundary in 1981, implementation of these development schemes has generally lagged behind population growth and lacked a strategic vision for the forward development of the city. Correspondingly, a substantial share of stakeholder and community respondents believed that improving this aspect of the city was the most critical objective in reducing Honiara's climate vulnerability and improving its urban resilience. Objectives at a city-scale were categorised in two broad ways: better planning for current and future climate-related natural hazards (Objectives 1.4-1.7 in Figure 38), and a more anticipatory, fully-implemented strategic process for managing the city's rapid urban growth (Objectives 1.1-1.3). Many objectives correspond to the recently-endorsed joint HCC-MLHS Local Planning Scheme, and will be able to be achieved through integration of these parallel agendas.

3.2.2 HOUSING

2. Housing	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
2.1 Flood-proofed housing and buildings	✓✓✓✓	**MLHS**, MID, HCC, SIWA, CDCs
2.2 Housing safe from cyclones (location & design)	✓✓✓✓	**MLHS**, MID, HCC, SIWA, CDCs, FTEs, CCPB, MECCDM, Chiefs
2.3 Climate-resilient building standards and codes	✓✓✓✓	**MLHS**, MID, MECCDM, HCC, Police, International Donors
2.4 Households with land title/registration	✓✓✓✓	**MLHS**, MID, HCC, UN-Habitat

2.5 Fire-resistant buildings	✓✓✓✓	**MLHS**, Fire Service, DP, NGOs, HCC, SIEA, MPHS
2.6 Access to essential services	✓✓✓✓	**SIWA, SIEA,** HCC, MID, MLHS, Donor/Funders

Figure 39: City-wide HURCAP Objectives – Housing

Within the urban setting, improvement of housing quality, and the ability of residential areas to cope with climate impacts, was viewed as a critical area for reducing the city's overall vulnerability, and protecting Honiara's population and their livelihoods in the event of a climate-related or natural disaster. With roughly half (46%) of the city's housing based on a single-storey, timber frame construction model, a number of opportunities exist to transfer climate-resilient housing construction techniques from elsewhere in the Asia-Pacific region, by partnering with external expertise. Although MLHS has been proposed as the implementation partner for many of the objectives set out in Figure 39, the need for partnerships for expert input, as well as technical support by utilities such as SIWA and SIEA, was emphasised in consultations.

3.2.3 INFRASTRUCTURE

3. Infrastructure	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
3.1 Climate-resilient and functional public and critical infrastructure	✓✓✓✓	**MID**, HCC, SIWA, SIEA, Telekom, MECCDM, NDMO, Donors/Funders
3.2 Development of an efficient and well-maintained road network	✓✓✓✓	**MID**, HCC, Donors/Funders
3.3 Low-carbon transport options	✓✓✓✓	**MID**, HCC, MECCDM, MMHS
3.4 Stormwater drainage infrastructure to manage river flooding	✓✓✓✓	**MID**, SIWA, HCC, MLHS, Donors/Funders, MECCDM
3.5 Erosion protection of waterfront and river banks	✓✓✓✓	**MID,** MLHS, HCC MoFR
3.6 Cooler living spaces and walkways	✓✓✓✓	**HCC,** MoFR, MLHS, MID

Figure 40: City-wide HURCAP Objectives – Infrastructure

Beyond the residential sector, all stakeholders and community representatives recognised that there was a significant infrastructure deficit across the city in terms of both a backlog of maintenance of existing infrastructure assets (some of which were identified as being no longer functional), and additional assets required by the city's rapidly growing population. As identified in Figure 40, many of these initiatives will need to be led by the Ministry of Infrastructure and Development, with the support of local authorities, external experts and critically ODA funding support. A number of objectives in the infrastructure also reflect community and stakeholder aspirations for the city, including low-carbon transport (reflecting the high levels of congestion and pollution that characterise the city's arterial road network), and enhanced public spaces, which are viewed as 'win-win' areas for the city with health, tourism, productivity and environmental benefits. ODA and other funding opportunities for supporting these large-scale initiatives are further discussed in Section 6 of this plan.

3.2.4 WATER, SANITATION AND WASTE

4. Water, Sanitation and Waste	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
4.1 Functional sanitation systems	✓✓✓✓	**SIWA,** HCC, MID, Int. Partners, MLHS, MHMS, MECCDM
4.2 Effective rubbish disposal and collection systems	✓✓✓✓	**HCC,** Communities, MLHS
4.3 A climate hazard-safe, long-term, waste disposal site	✓✓✓✓	**HCC,** MHMS, MALS, MECCDM
4.4 Clean drinking water access for all residents	✓✓✓✓	**SIWA,** HCC, GPG, NHL
4.5 Effective and well-maintained drainage systems	✓✓✓✓	**SIWA**, HCC, MID, World Bank, Community leaders, CDCs
4.6 Development of a plastics recycling scheme	✓✓✓✓	**HCC**, Plastic supply companies, CDCs, JICA, SICC
4.7 Reduction in coastal/river pollution	✓✓✓✓	**Community Leaders**, HCC, MECCDM, MHMS
4.8 Water catchment planning, including sustainable use of groundwater resources	✓✓✓✓	**MLHS**, SIWA, HCC, GPG, MECCDM, Community Leaders
4.9 Clarify water source/catchment land ownership	✓✓✓✓	**Land Board**, MLHS, SIWA, Community Leaders, GPG

Figure 41: City-wide HURCAP Objectives – Water, Sanitation and Waste

As reflected in the issues diagram in Figure 37, water access, sanitation and waste were consistently viewed as the sectors that required the most urgent action in the face of climate-related shocks, rapid population growth, and a cycle of hygiene and health-related issues related to disease transmission. Although many of these objectives are not directly driven by climate, they provide a wide range of existing hazards and risks that are severely worsened – or exacerbate the impacts of – climate-related extreme events such as cyclones or extreme rainfall. A partnership between the community, the municipal council, and the relevant utility was seen as critically important in achieving these objectives, with the prospect of setting up a joint working group specific to this area led by representatives from these three groups. Investments in water, sanitation and waste infrastructure were also seen as being needed to be met 'half-way' by the community that would benefit from them, with behaviour-based objectives (e.g. 4.7, Figure 41) underpinning the function and ongoing maintenance of any improvements in infrastructure. As noted in the SIWA workshop, however, limitations in resourcing and legislative jurisdiction would require external financial support and/or novel community-level partnerships if implementation was to be rolled out at scale.

3.2.5 ECOSYSTEM SERVICES AND COASTAL PROCESSES

5. Ecosystem Services and Coastal Processes	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
5.1 Understanding and enhancing local ecosystem services	✓✓✓✓	**MECCDM,** SPREP, UN-Habitat MoFR, HCC, CDCs, DSE
5.2 Revegetation & protection of existing urban forest, vegetation and ecosystem assets	✓✓✓✓	**HCC**, MoFR, MECCDM, MID, DSE, Community Leaders
5.3 Enhanced agricultural production and reduced imported food dependency	✓✓✓✓	**MoAL**, MoF, HCC, GPG, DSE
5.4 Preparedness for coral bleaching and marine change	✓✓✓✓	**MECCDM**, Tourism operators, Fishermen, HCC, MEHRD
5.5 Coastal settlements safe from sea level rise impacts	✓✓✓✓	**MLHS**, HCC, Community leaders, MID, Donors
5.6 Coastal settlement protection from tsunamis	✓✓✓✓	**MID,** NDMO, MLHS, HCC, Community Leaders
5.7 Management of coastal erosion hotspots	✓✓✓✓	**MID,** MLHS, HCC, MECCDM

Figure 42: City-wide HURCAP Objectives – Ecosystem Services and Coastal Processes

As noted in Section 2.6 of this plan, marine and land-based ecosystem services make up a significant share of household livelihoods in Honiara, and compensate for shortfalls in infrastructure and utilities (for instance, the natural springs shown in Figure 23). Protection and enhancement of these services is therefore a core objective of this plan, and extends across government institutions (though particularly within MECCDM). Potential linkages with other ecosystem based adaptation agendas are discussed in Section 6, while hybrid models that integrate hard infrastructure (such as sea walls and breakers) will require engagement and partnership with MID, key international donors and the private sector.

3.2.6 HUMAN HEALTH AND WELL-BEING

6. Human Health and Well-being	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
6.1 Clean, healthy and safe environment	✓✓✓✓	**HCC**, MHMS, Community leaders, CDCs, MID
6.2 Strategies for managing exposure to extreme heat	✓✓✓✓	**HCC**, MHMS, MLHS, MoFR, Community leaders
6.3 Effective health policies and accessible facilities	✓✓✓✓	**MHMS**, MID, HCC, GPG
6.4 Improve climate-related health awareness campaigns	✓✓✓✓	**MHMS**, MEHRD, HCC, DSE
6.5 Reduced risk of loss of life in event of a tsunami	✓✓✓✓	**NDMO**, Community Leaders, MECCDM, MID
6.6 Reduced incidence of disease	✓✓✓✓	**MHMS**, HCC, DSE , CDCs
6.7 Reduced environmentally-driven health issues	✓✓✓✓	**MHMS**, HCC, CDCs, DSE

Figure 43: City-wide HURCAP Objectives – Human Health and Well-being

The health and well-being of Honiara's residents is a wide-reaching goal within the HURCAP, and relates to both the underlying vulnerability of the city's population to climate impacts (where at-risk citizens such as the sickly and disabled often have a higher sensitivity), as well as direct, climate-related health issues (for instance Objective 6.2 in Figure 43). Objectives relate to education, environmental conditions, facilities, and high-level well-being goals, and will predominantly need implementation leadership from within MHMS. Existing health education programs can also be leveraged to spread a wider awareness of climate-related health impacts, building on existing engagement of MHMS staff in the HURCAP design phase, as well as HCC health staff.

3.2.7 COMMUNICATION: AWARENESS AND EDUCATION

7. Communication: Awareness and Education	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
7.1 Education on environmental risks	✓✓✓✓	**DSE,** SIDT, MECCDM, HCC, MHMS, MLHS, SINU, MEHRD
7.2 Promotion of non-written climate communications to reach all members of the community	✓✓✓✓	**MECCDM**, RMIT, DSE, VBM, UN-Habitat, CDCs, Churches
7.3 Improved community understanding and awareness of local climate change impacts	✓✓✓✓	**HCC,** CDCs, DSE, Churches, MEHRD, MECCDM
7.4 Well-resourced disaster risk reduction, response and management awareness programs, and community engagement	✓✓✓✓	**NDMO**, MECCDM, Donors/ Funders, HCC
7.5 Monitoring / surveillance systems for disease	✓✓✓✓	**MHMS**, HCC, CDCs

Figure 44: City-wide HURCAP Objectives – Communication: Awareness & Education

The need to build a wider level of community 'climate literacy' was both evident in responses, and in the initial introductory component of the workshops themselves. In particular, the lack of easily-understandable non-written modes of climate communications, including posters, drama, radio-shows and dance, was noted by all hotspot communities, and during the NGO and youth workshops. As a result, RMIT University has already initiated some pilot work in this area in partnership with DSE and VBM. However, in order to access all communities across the city, capacity will need to be built in these areas within HCC, as well as the NGO community as a whole (via umbrella bodies such as DSE, as shown in Figure 44).

3.2.8 LIVELIHOODS AND BEHAVIOUR CHANGE

8. Livelihoods and Behaviour Change	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
8.1 Sustainable rates of urban population growth	✓	MHMS, Churches, DSE, HCC, CDCs, MWCY, MEHRD
8.2 Manage urban migration	✓✓✓	**Provincial Governments**, GPG, HCC, MEHRD, MID
8.3 Reduce traffic congestion and car dependency	✓✓✓	**MLHS**, MPWS, MID, HCC
8.4 Create jobs that enhance climate resilience	✓✓✓✓	**MEHRC**, MECCDM, HCC, MWCY, MoF, SINU
8.5 Reduce community violence	✓	**RSIP**, Community leaders, HCC, MWCY

Figure 45: City-wide HURCAP Objectives – Behaviour Change

Objectives relating to behaviour change are arguably some of the hardest to achieve in any setting, however reducing rapid rates of population growth in the Solomon Islands in particular is central to national stability and development, while rural-to-urban migration can be seen to be one of the underlying challenges from which the shortfalls in urban infrastructure, land tenure and housing quality arise. Novel and sustained strategies will be needed to achieve the objectives set out above (Figure 45), with cross-sector partnerships and an emphasis on community groups and leaders in areas such as church groups, education programmes, and also wider reach strategies such as decentralisation of services and establishment of 'pull' factors in townships other than Honiara. Within the city, government agencies will need to facilitate shifts to more sustainable transport options, as well as provide the policies and incentives that encourage climate-resilience related job opportunities.

3.2.9 DISASTER PREPAREDNESS AND RESPONSE

9. Disaster Preparedness and Response	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
9.1 Regularly updated disaster action plan	✓✓	**NDMO,** HCC, MECCDM
9.2 Early warning systems and communication to all communities	✓✓✓	**NDMO,** HCC, MID, MECCDM Community Leaders, DSE
9.3 Provision of emergency shelters	✓✓✓	**MID,** NDMO, Community leaders, CDCs, UN-Habitat

Figure 46: City-wide HURCAP Objectives – Disaster Preparedness and Response

Preparedness for, management of and response to extreme weather events is strongly integrated with existing Disaster Risk Management processes, which fall largely within the jurisdiction of the NDMO, as well as the HCC disaster management team. Although the focus of this plan is broadly on climate-related impacts, the strengthening of these existing institutions through mutually-beneficial objectives and the integration of planning processes and resources was strongly supported by both government-level stakeholders and the communities on the ground that require effective assistance in a post-disaster context, regardless of the strength of the link to climate change. Opportunities for integration with DRM work, such as the ICLEI/UNISDR Disaster Resilience Scorecard process, are detailed further in Section 6 of this plan, with existing links to hotspot communities built through the HURCAP process potential avenues

for implementation of mutually beneficial actions (such as development of emergency shelters as proposed in Figure 46).

3.2.10 GOVERNANCE AND PARTNERSHIPS

10. Governance and Partnerships	Climate Related (1-4)	Stakeholder-proposed Implementation Partners
10.1 Enhanced government, utility and business linkages through Community Development Committees	✓✓✓✓	**CDCs**, HCC, SIWA, SIEA, MLHS, SICC, MECCDM
10.2 Intra-Ministry task force to mainstream urban climate resilience planning	✓✓✓✓	**OPMC,** All SIG Ministries
10.3 Enhanced partnership working between Ministries, HCC and Ward Development Councils	✓✓✓✓	**HCC,** MECCDM, MLHS, MID, WDCs
10.4 Strengthen governance capacity	✓✓✓✓	**HCC,** MECCDM, MLHS, MID, WDCs
10.5 Establish community committees for land use planning	✓✓✓✓	**HCC**, MLHS, Land Board, WDCs, CDCs
10.6 Integrate water catchment plan with community structures	✓✓✓✓	**MLHS,** SIWA, Community Leaders, MECCDM, CDCs, HCC
10.7 Empowerment of women, youth and other disadvantaged groups	✓✓✓✓	**HCC,** MYWC, DSE

Figure 47: City-wide HURCAP Objectives – Governance and Partnerships

Governance processes and partnerships sit across the other nine objective areas, and, although not explicitly a response to climate change, the strengthening of government capacity will address a key weakness in the city's overall adaptive capacity (as set out in Figure 27). In particular, opportunities were noted for building cross-government coordination of climate-related activities (both within and outside of Honiara), with models such as Vanuatu's *National Advisory Board for Climate Change and Disaster Risk Reduction* available to be learnt from within the region.

Beyond national government engagement, strengthening the hierarchy of governance all the way down to the community level would better allow existing community networks and resources to be mobilized, which would greatly benefit other objective areas (for instance, achievement of Objective 10.6 in Figure 47 would significantly strengthen the ability to meet objectives set out in areas such as Water, Sanitation and Waste, and Ecosystem Services & Coastal Processes).

A combined partnership in this area from HCC, OPMC and community leaders is seen as critical to ensuring that the HURCAP actions are mainstreamed effectively and spread across the different community groups and stakeholders within the city.

4. URBAN RESILIENCE & ADAPTATION ACTION PLANNING

This chapter showcases a portfolio of specific actions that were identified through local stakeholder engagement processes. These include a high-level workshop involving the Honiara City Council, which was held to scope out interventions at the city-wide scale, as well as a series of community workshops, which were used to identify the most important local actions as nominated by the inhabitants of vulnerability hotspot areas. The potential actions are grouped according to the objective categories set out in the previous section, and linked to specific objectives where relevant. Actions relating to urban planning, water, waste and sanitation, and governance processes emerged as the most prevalent at the city-scale. Each of the vulnerability hotspots highlighted actions specific to their location, as well as addressing more common issues relating to development and informal settlements across the city.

Proposed actions for city-wide actions were subject to further scrutiny at an expert workshop held in Honiara in July 2016. This workshop involved many of the named lead partners, allowing for potential actions to be debated and confirmed, implementation leaders to be suggested (and revised from original stakeholder suggestions in some instances), and any additional actions put forward for inclusion in the action plan. The following tables highlight the identified actions, including consideration of timing, priority, cost and lead implementation organisations. Organisational abbreviations used in the tables are as follows:

CDC – Community Development Committee
MWCY – Ministry of Women, Children and Youth
DSE – Development Services Exchange (CSO)
NDMO – National Disaster Management Office
HCC – Honiara City Council
OPMC – Office of the Prime Minister and Cabinet
G Prov – Guadalcanal Province
RSIP – Royal Solomon Islands Police Force
JICA – Japan International Cooperation Agency
SICC – Solomon Islands Chamber of Commerce
MECCDM – Ministry for the Environment, Climate Change and Disaster Management
SIEA – Solomon Islands Electricity Authority
MEHRD – Ministry of Education & Human Resources Development
SIMS – Solomon Islands Meteorological Service
MFR – Ministry of Forestry and Research
SIWA – Solomon Islands Water Authority
MFT – Ministry of Finance and Treasury
SINSO – Solomon Islands National Statistics Office
MHA – Ministry of Home Affairs
SPC – Secretariat of the Pacific Community
MHMS – Ministry of Health and Medical Services
SPREP – Secretariat of the Pacific Regional Environment Program
MID – Ministry of Infrastructure and Development
TCPB – Town and Country Planning Board
MLHS – Ministry of Lands, Housing and Survey
UNH – United Nations Human Settlement Programme
MMERE – Ministry of Mines, Energy and Rural Electrification
WB – World Bank

4.1 HONIARA CITY-WIDE ACTIONS

4.1.1 URBAN PLANNING AND LAND DEVELOPMENT

Urban growth continues to be fast, at current growth rates it is expected that the population within the boundaries will increase from an estimated 87,000 in 2015 to 120,000 by 2030. Climate change impacts on rural and fishing communities are likely to add to the push factors with economic development in Honiara adding to pull factors, likely accelerating urban growth. Peri-urban growth along the outside boundary of Honiara (in Guadalcanal Province) has recently been much faster than within the city, further accelerating the growth of greater Honiara. These drivers will likely contribute to the growth of settlements in hazard-prone areas. Further, the population pressure, if not properly managed, will increase climate sensitivities, through further environmental degradation (deforestation, coastal and riverine ecosystems), increasing the likelihoods of floods. Actions include the mapping of hazards, and the designation

of no-build zones in hazard prone areas. Climate change considerations also need to be mainstreamed into all levels of policy.

1. City-wide Urban Planning & Land Development Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA1.1 Integrate climate change into Informal Settlements Upgrading strategies, plans and actions and ensure that all TOL to FTE conversions are in areas outside of high climate/natural hazard risk zones, as well as utility access, recreational and public use zones.	1.2, 1.4	✓	✓	✓	Medium Term	High	$$$$	MLHS
HCA1.2 Develop a city-wide map of hazard zones which informs TOL to FTE conversions as well as municipal, utility and growth/development plans.	1.4, 1.5, 4.8, 5.2, 5.5, 5.6, 10.6	✓	✓	✓	Short Term	High	$$$$	MLHS
HCA1.3 Ensure that the Honiara Local Planning Scheme 2015/the emerging Planning and Development Act (replacing the Town and Country Planning Act) fully recognize the recommendations and actions of this plan.	1.1, 1.2, 1.3, 1.5	✓	✓	✓	On-going	Med	$$$$	MLHS
HCA1.4 Conduct a whole-of-govt. review to identify areas for mainstreaming of climate change considerations across urban policy.	1.3, 10.2	✓	✓	✓	Short Term	Low	$$$$	MECCDM
HCA1.5 Strengthen community engagement at sub-ward and ward levels in local resilience planning and LPS implementation.	1.3	✓	✓	✓	Short Term	High	$$$$	MLHS
HCA1.6 Develop an urban heat reduction approach, including low-cost design options, open/green space and urban forest enhancements for the city.	1.3, 2.3, 3.1, 3.6, 5.1, 5.2, 6.2	✓	✓	✓	Medium Term	Med	$$$$	HCC/ MLHS
HCA1.7 Assess the feasibility of converting all or part of the National Referral Hospital site to a climate-sensitive public reserve, including restoration of the coastal zone, drainage enhancements and reforestation.	1.4, 1.5, 3.4, 4.5, 4.7, 5.2, 5.7, 6.2	✓	✓	✓	Short Term	Med	$$$$	MHMS/ HCC
HCA1.8 Develop, implement and publicly communicate water catchment management plans for the city's water supply source areas.	1.5, 4.8	✓	✓	✓	Short Term	High	$$$$	MLHS/ MECCDM
HCA1.9 Develop a relocation policy/strategy for at-risk households based on intensive community and stakeholder consultations.	1.6	✓	✓	✓	Short Term	High	$$$$	MLHS / MECCDM
HCA1.10 Integrate ecosystem strategies (ridge to reef) into all planning initiatives, and develop a coastal zone management plan, as well as a water catchment protection plan.	1.5; 4.8	✓	✓	✓	Short Term	Med	$$$$	HCC / MECCDM

HCA1.11 Review the urban drainage network and develop a climate-sensitive and community-led integrated drainage, distributed water capture and re-use master plan and explore regional funding models/opportunities for upgrades.	1.7, 4.4, 4.8 10.6	✓	✓	✓	Long Term	Med	$$$$	MID/ SIWA

4.1.2 HOUSING

The quality of much of the building stock in Honiara is poor and many of the informal settlements are located in high risk areas. The upgrading of informal settlements, land use zoning, and improving access to services, are central to this theme. It would also be beneficial to carry out further community profiles and vulnerability assessments to better inform future resilience actions.

2. City-side Housing Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA2.1 Expand the Informal Settlement Upgrading programme, prioritising avoidance of climate-vulnerable, hazard-exposed areas.	1.2, 2.1, 2.4, 2.6, 10.1	✓	✓	✓	Short Term	High	$$$$	MLHS/ UNH
HCA2.2 Conduct a representative survey on compliance of existing housing stock with bylaws and codes.	2.1, 2.2., 2.3, 10.4	✓	✓	✓	Short Term	Low	$$$$	HCC
HCA2.3 Establish a Building Audit Programme for enforcing codes, improving existing building stock and defending high-risk exclusion zones, and ensure enforcement of building ordinance.	2.1, 2.2, 2.3, 2.5, 8.4, 10.4	✓	✓	✓	Medium Term	Med	$$$$	HCC
HCA2.4 Integrate a climate hazard component into the TOL/FTE upgrading process.	2.1, 2.3, 2.4, 2.5	✓	✓	✓	Short Term	Med	$$$$	MLHS/ UNH / SPC
HCA2.5 Review utility connection rules for traditional housing and explore low-cost, off-grid options for energy, water and sanitation.	2.5, 2.6	✓	✓	✓	Medium Term	Low	$$$$	G Prov/ Utilities
HCA2.6 Conduct additional vulnerability assessments for 'hotspot' zones (e.g. Nggosi and South-east Panatina).	1.6, 2.1, 2.2, 7.1	✓	✓	✓	Short Term	High	$$$$	UNH

4.1.3 INFRASTRUCTURE

Discussions for the infrastructure theme focussed on water, transport and energy. The location of the Point Cruz port facility, and associated fuel storage, was also noted as problematic due to exposure to natural hazards and limitations to urban growth.

3. City-wide Infrastructure Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA3.1 Conduct a feasibility assessment for the relocation of Point Cruz heavy industry and associated port facilities and fuel storage, taking into account natural hazards and urban growth.	1.3, 3.1, 3.5, 5.1, 5.5, 5.7, 8.3	✓	✓	✓	Short Term	Med	$$$$	MLHS/ MID/ MMERE
HCA3.2 Explore design options for climate-sensitive public open space and commercial opportunities around the Point Cruz site.	3.1, 3.5, 5.2	✓	✓	✓	Medium Term	Low	$$$$	HCC/ MLHS/ Port Auth.
HCA3.3 Assess the total capacity of existing potable water assets relative to 'worst case' rapid population growth scenarios.	3.1, 3.4	✓	✓	✓	Short Term	High	$$$$	SIWA/ MECCDM / MMERE
HCA3.4 Enhance community-integrated water efficiency and maintenance regimes for water infrastructure.	3.1, 3.4	✓	✓	✓	Medium Term	High	$$$$	MMERE / SIWA/
HCA3.5 'Future proof' North-South access routes to inland growth areas allowing for grade-duplication on key arterial routes.	1.3, 3.1, 3.2, 8.3,	✓	✓	✓	Short Term	High	$$$$	MLHS/ HCC/ Lands Board
HCA3.6 Develop a detailed assessment of a city-bypass as set out in the LPS, accounting for natural hazards, climate impacts and pop. growth.	1.3, 3.1, 3.2, 8.3	✓	✓	✓	Medium Term	High	$$$$	MID/ MLHS/ HCC / G Prov
HCA3.7 Implement an active city transportation strategy, including better public transportation, pavement enhancements, shading through green infrastructure and pilot programmes to encourage bicycle use.	3.1, 3.3, 3.6, 6.6, 8.3, 8.4	✓	✓	✓	Short Term	Med	$$$$	HCC/ MID
HCA3.8 Incentivise and engage small businesses in the importation of small-scale solar to diversify energy sources, allow decentralised use of low-energy appliances such as mobile phones, and promote bicycles.	3.1, 6.4, 6.5, 7.2, 8.4, 9.2, 10.1	✓	✓	✓	Short Term	Med	$$$$	MECCDM/ MID / MMERE / MFT
HCA3.9 Establish a street tree planting programme along major access routes for urban cooling and beautification, and protect the urban forest protection through community engagement and law enforcement.	3.6, 5.2	✓	✓	✓	Medium Term	Med	$$$$	HCC/ MECCDM / MFT

HCA3.10 Identify, support and stimulate local businesses in low-cost household water capture and storage alternatives.	3.1, 3.4, 3.5, 4.4, 4.5, 4.8	✓	✓	✓	Short Term	High	$$$$	MID/ MECCDM

4.1.4 WATER, SANITATION AND WASTE

These are perhaps the most critical issues in the short to medium term for residents of Honiara, and there are also key links to initiatives in action sections 1 and 2 (in terms of water use and catchment issues). A city-wide review of sanitation would provide a useful baseline.

4. City-wide Water, Sanitation & Waste Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA4.1 Conduct comprehensive review of Honiara's stormwater drainage network and outfalls, accounting for sea level risk and rainfall change.	4.1, 4.2, 4.5, 4.7, 4.8, 5.5, 5.7	✓	✓	✓	Short Term	High	$$$$	MID/ HCC
HCA4.2 Enhancement of drainage systems, including improved links to community-driven drainage programmes.	4.1, 4.5, 4.7, 4.8, 5.5, 5.7	✓	✓	✓	Medium Term	Med	$$$$	MID/ HCC
HCA4.3 Explore the feasibility of a reticulated sewerage system.	4.1, 4.5, 4.7, 4.8, 5.5, 5.7		✓	✓	Short Term	Med	$$$$	SIWA
HCA4.4 Review household sanitation systems across the city's riparian zones and water catchment areas.	4.1, 4.7, 4.8, 6.1	✓	✓	✓	Short Term	High	$$$$	HCC / MECCDM
HCA4.5 Roll-out low-cost sealed sanitation options in hotpots areas identified in HCA4.3.	2.6, 4.1, 4.7, 4.8, 6.1, 6.3, 6.6, 6.7	✓	✓	✓	Short Term	High	$$$$	HCC / MHMS / WASH NGOs
HCA4.6 Explore feasibility of and interest in community-level investment in shared septic tank systems, co-funded by government.	4.1, 4.7, 4.8, 6.1, 10.3	✓	✓	✓	Short to Medium Term	Med	$$$$	SIWA
HCA4.7 Review compliance of commercial developments with sanitation-related legislation and identify options for policy improvement within Building Ordinance.	4.1, 4.7, 4.8, 6.1, 10.1	✓	✓	✓	Short to Medium Term	Med	$$$$	HCC/ SIWA
HCA4.8 Develop and implement a city-wide integrated solid waste management strategy in consultation with CDCs and international experts.	2.6, 4.2, 4.6, 4.7, 10.1, 10.3	✓	✓	✓	Short Term	High	$$$$	MECCDM / HCC
HCA4.9 Pilot organic waste composting and garden re-use initiatives applied rurally across SI in key waste hotspots across the city through CDC/HCC/NGO partnerships.	2.6, 4.2, 4.7, 5.1, 5.3, 10.1, 10.7	✓	✓	✓	Short Term	Med	$$$$	HCC / DSE/ MLHS[4]

[4] There is potential to integrate pilot projects by Gurafesu on organic waste composting / gardening. Ref: http://www.adb.org/sites/default/files/publication/42662/solid-waste-management-solomon-islands.pdf

HCA4.10 Develop an organic waste collection program for the Central Market (public – private partnership).	4.2, 4.7, 10.1	✓	✓	✓	Short Term	Med	$$$$	HCC / JICA / private sector
HCA4.11 Carry out a feasibility study into options for reducing the use of plastic bags.	4.2, 4.6, 10.1,	✓	✓	✓	Short Term	Med	$$$$	HCC / JICA / SICCI / MECCDM
HCA4.12 Approach key international suppliers of plastics with possible partnership options for a plastics recycling scheme.	4.2, 4.6, 10.1, 10.3	✓	✓	✓	Medium Term	Med	$$$$	HCC / MECCDM / SICCI
HCA4.13 Identify and reserve a climate and natural hazard secure future site for relocating the municipal landfill, taking into account urban growth patterns and projections.	1.3, 2.6, 3.1, 4.3, 4.7, 10.3	✓	✓	✓	Medium Term	High	$$$$	HCC / MLHS / MECCDM
HCA4.14 Ensure that climate change impacts and potential natural disaster risks are being considered in the remediation works of the Renadi Landfill site and map out future upgrade schedules as required.	1.3, 2.6, 3.1, 4.3, 4.7	✓	✓	✓	Short Term	Med	$$$$	HCC / JICA/ MECCDM
HCA4.15 Build in the potential for methane recovery at a new municipal waste landfill site.	3,1, 4.2, 10.4	✓	✓	✓	Medium Term	Low	$$$$	HCC / MECCDM / SIEA
HCA4.16 Review the filtration technologies used at reservoir tanks and extraction sources to provide better quality water as part of ongoing improvements in water quality.	2.6, 4.4	✓	✓	✓	Short Term	Low	$$$$	SIWA / MHMS
HCA4.17 Install public water taps in key public spaces within water-poor communities and the city centre (CSO fund).	2.6, 4.4	✓	✓	✓	Short Term	Med	$$$$	HCC / SIWA
HCA4.18 Establish a community-led, government supported 'Water Care' body for cleaning up and revegetating riverine areas, waterways and coastal zones.	1.7, 4.7, 8.4, 10.3, 10.4, 10.7	✓	✓	✓	Medium Term	Med	$$$$	HCC / SIWA / DSE / MECCDM

4.1.5 ECOSYSTEM SERVICES AND RIVER AND COASTAL PROCESSES

It was recognised in the expert workshop that the riparian environment was equally important as the coastal zone therefore the theme heading was altered to account for this. Important legislation was noted as the Rivers and Waters Act, Protected Areas Act, Botanist Act, SIWA Act and the Forest Act; and there are also links to a new SPREP Ecosystem Services project as well as a SPC GEF5 'ridge to reef' project. There are also important connections with tourism but currently there is no integrated management plan for the coast.

5. City-wide Actions: Ecosystem Services, Riparian & Coastal Processes	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA5.1 Assess natural resources across the city, their use by communities, and develop resource management plans.	5.1, 10.4	✓	✓	✓	Short Term	Med	$$$$	SPREP/ MECCDM / NGOs / HCC / TCPB
HCA5.2 Integrate ecosystem services and Ecosystem-based Adaptation (EbA) actions into Water Catchment Management Plans.	1.5, 4.4, 4.8, 5.1	✓	✓	✓	Medium Term	Med	$$$$	MECCDM/ HCC / SIWA / SPREP
HCA5.3 Map the city's urban vegetation using satellite imagery/LANDSAT, identifying priority areas and opportunities for urban forest enhancement/plantings.	1.7, 3.6, 5.2, 6.2, 8.4, 10.6	✓	✓	✓	Short Term	Med	$$$$	MECCDM/ HCC / MFR
HCA5.4 Assess historical changes to the city's coastal morphology, including recent infill and protection impacts on surrounding residential zones, in partnership with coastal communities. Future threats also need to be considered.	1.3, 1.5, 1.7, 5.1, 5.4, 5.5, 5.7, 7.3	✓	✓	✓	Short Term	High	$$$$	MECCDM/ MLHS /HCC
HCA5.5 Conduct community engagement around coastal and river bank protection options.	5.1, 5.5, 5.7, 7.3	✓	✓	✓	Short Term	High	$$$$	MECCDM/ MLHS/ HCC/ NGOs / WB
HCA5.6 Building on HCA 5.4, 5.5, Develop and implement a Coastal Management Plan, applying hybrid EbA and engineered protection measures. Also consider potential to link to Honiara Beautification scheme.	1.7, 3.5, 4.8, 5.1, 5.2	✓	✓	✓	Medium to Long Term	High	$$$$	MECCDM/ HCC /MID / SPREP
HCA5.7 Create regulatory provisions that take into account and compensate for changes to coastal erosion processes beyond coastal development sites.	1.3, 2.1, 2.3, 3.5, 5.2, 5.4, 5.5, 5.7	✓	✓	✓	Short Term	Low	$$$$	HCC/ MLHS / TCPB
HCA5.8 Pilot community-led tree-planting programmes within urban coastal and riverine areas with ongoing monitoring of changes (links to urban agriculture and food security).	3.5, 5.7	✓	✓	✓	Short Term	Med	$$$$	MECCDM/ CDCs /HCC / SPREP

4.1.6 HUMAN HEALTH AND WELLBEING

Concerns were raised about the impact of climate change on human health (heat and vector-borne disease), but a major focus was the consideration of new site assessments for the national referral hospital relocation and new incinerators for hospital waste. All actions were adjusted to short term during the expert workshop.

6. City-wide Human Health & Well-being Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead
HCA6.1 Conduct a scoping study into extreme heat impacts on hospitalisation/morbidity/mortality, as well as presentations to health clinics across Honiara (to help with planning of referral pathways).	6.2	✓	✓	✓	Short Term	Low	$$$$	MHMS/ MECCDM/ HCC
HCA6.2 Host a 'Climate & Health Expo' for the public, with a focus on climate-related health risks and communicable/vector-borne diseases (this was noted as ongoing).	6.1, 6.3, 6.4, 7.1, 7.3, 10.7	✓	✓	✓	Short Term	Med	$$$$	HCC/ MHMS/ MECCDM
HCA6.3 Conduct a climate and natural hazard risk assessment of the new National Referral Hospital site, incorporating potential risk treatments and consideration of access routes during a disaster event (ongoing – relocation task force).	2.6, 3.1, 6.1, 6.3, 6.5, 6.6	✓	✓	✓	Short Term	High	$$$$	MHMS
HCA6.4 Secure funding and ongoing budget allocation for incinerators for healthcare waste (new sites are being subject to feasibility assessments).	1.5, 4.2, 6.1, 6.7, 10.4	✓	✓	✓	Short Term	High	$$$$	HCC / MHMS
HCA6.5 Review National Referral Hospital and medical facilities/clinic waste disposal procedures.	6.1, 6.7	✓	✓	✓	Short Term	Med	$$$$	MHMS / HCC
HCA6.6 Improve and maintain a spatial/GIS database of vector-borne disease presentations in and around the city, and communicate to community members through CDCs (ongoing, possible collaboration with the Met Office).	6.3, 7.5, 10.3	✓	✓	✓	Short Term	Med	$$$$	MHMS/ HCC

4.1.7 COMMUNICATION, AWARENESS AND EDUCATION

Communication and awareness raising were continuously flagged as critical to enhancing community resilience, with particular attention paid to empowering women and youth. The important role of NGOs, local civil society organisations and the church was also emphasised during workshop processes. Two new actions were also added during the expert workshop – mainstreaming climate change into the school curriculum and providing training for church leaders.

7. City-wide Communication, Awareness & Education Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead
HCA7.1 Pilot best-practice participatory city government community engagement with hotspot communities in climate action planning.	6.3, 6.4, 7.1, 7.3, 7.4, 10.3, 10.7	✓	✓	✓	Short Term	Med	$$$$	HCC/ ICLEI/ UNH / NGOs
HCA7.2 Use existing networks to identify and transfer best practice community engagement and communication strategies.	6.3, 7.1, 7.4, 10.3, 10.4, 10.7	✓	✓	✓	Short Term	Med	$$$$	DSE / NGOs (local) ICLEI / UNH (inter-national)
HCA7.3 Engage with Vois Blong Mere to develop a women-focused climate communications programme, through theatre, radio and newsletters.	7.1, 7.2, 7.3, 8.4, 10.1, 10.7	✓	✓	✓	Short Term	High	$$$$	HCC/ MYWC
HCA7.4 Engage the HCC Youth Council to produce youth-focused climate change communication initiatives, including social media, mobile platforms, and theatre/dance.	7.1, 7.2, 7.3, 8.4, 10.1, 10.7	✓	✓	✓	Short Term	Med	$$$$	HCC/ MYWC / NGOs
HCA7.5 Review city-wide disaster response communications technologies and procedures, including training drills, and identify warning/response black-spots for each hazard. Link to community level early warning system.	7.4, 9.1, 9.2, 10.4	✓	✓	✓	Short Term	High	$$$$	NDMO/ HCC
HCA7.6 Identify and transfer civil society WASH communications initiatives to city-dwellers, with a focus on areas with poor sanitation/drinking water access.	4.8, 5.1, 6.1, 6.4, 6.6, 7.1, 7.3, 10.6	✓	✓	✓	Short Term	High	$$$$	MHMS / NGOs
HCA7.7 Mainstream climate change into the national school curriculum.	-	✓	✓	✓	Medium Term	High	$$$$	MECCDM / MoE
HCA7.8 Climate training for church leaders.	-	✓	✓	✓	Short Term	High	$$$$	Council of Churches

4.1.8 LIVELIHOODS AND BEHAVIOUR CHANGE

Discussions on this theme centred on strengthening the regions to encourage devolved urban growth (and reduce migration into Honiara), to improve pedestrian access/safety, promote Rapid Employment Program activities across the city, and to integrate climate change considerations into vocational training.

8. City-wide Actions: Livelihoods & Behaviour Change	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA8.1 Create an inter-ministry taskforce, including the provinces, for examining migration drivers and identifying decentralisation approaches to encourage urban growth in provincial centres and secondary towns.	1.1, 1.2, 2.6, 3.1, 8.2, 10.2	✓	✓	✓	Medium Term	High	$$$$	OPMC/ MLHS/ Provinces / HCC
HCA8.2 Review projected urban growth rates based on MLHS data and post-census SINSO survey information.	1.1, 8.1, 8.2, 10.4	✓	✓	✓	Short Term	Med	$$$$	MLHS/ SINSO/ UNH
HCA8.3 Review vehicle import standards and examine a vehicle import tax to fund road upgrades and maintenance, with incentives for lower emission vehicles.	3.2, 6.1, 8.3, 10.4	✓	✓	✓	Medium Term	Med	$$$$	MID/ Customs / SICC
HCA8.4 Assess pedestrian infrastructure in key walking routes around the city centre and invest in upgrades for congested sites, unsurfaced routes and high safety risk areas (also make provisions for elderly and disabled).	3.2, 6.1, 8.3	✓	✓	✓	Medium Term	High	$$$$	MID/ CDCs/ MLHS/ HCC
HCA8.5 Expand the Rapid Employment Program to target community resilience actions in other HURCAP hotspots, low-income and informal community areas.	3.1, 6.1, 8.4	✓	✓	✓	Short Term	Med	$$$$	World Bank/ MID/ HCC
HCA8.6 Build climate impacts modules into vocational training and education programmes focusing on climate resilience skills shortage areas.	7.3, 7.4, 8.4, 8.5, 10.4, 10.7	✓	✓	✓	Medium Term	High	$$$$	MoE/ MECCDM/ RMIT

4.1.9 DISASTER RISK REDUCTION AND MANAGEMENT

Resilience to natural disasters is a key concern for Honiara. A UNISDR self-assessment exercise for disaster risk reduction is currently being conducted with HCC by ICLEI and will identify the main institutional strengths and weaknesses, and ultimately lead to key recommendations for actions. Awareness raising in schools and a Honiara mock disaster response day were added as additional actions.

9. City-wide Disaster Risk Reduction & Management Actions	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA9.1 Update the HCC Disaster Operation Plan based on the outcomes of the UNISDR Resilience Toolkit and ICLEI capacity building programme.	9.1, 10.3, 10.4	✓	✓	✓	Medium Term	High	$$$$	HCC/ ICLEI/ NDMO
HCA9.2 Develop the digitization of hazard maps for the city for landslide, flood, tsunami, coastal erosion and storm surge risks, and collate in one accessible location.	1.4, 1.6, 7.1, 9.1	✓	✓	✓	Short Term	Med	$$$$	MECCDM/ MLHS /HCC / NDMO / SOPA
HCA9.3 Create an at-risk household rapid response taskforce for assisting hazard-prone communities located in the areas identified in HCA8.2, linked to CDCs and WDCs.	7.4, 9.2, 10.3, 10.4, 10.7	✓	✓	✓	Medium Term	High	$$$$	NDMO/ HCC
HCA9.4 Assess the coverage of emergency shelters across the Greater Honiara area and identify additional shelter sites required to cover 100% of the city's residents.	7.1, 9.3, 10.4	✓	✓	✓	Short Term	High	$$$$	MLHS/ NDMO/ HCC / MID
HCA9.5 Integrate HCA8.3's taskforce with early warning systems, built in all at-risk communities for relevant hazards (with a coordinator for each ward).	9.2, 10.2, 10.3, 10.4	✓	✓	✓	Medium Term	High	$$$$	NDMO/ HCC/ CDCs / Police and Fire services / NGOs
HCA9.6 Embed DRR personnel within all major ministries at a national level, contact points across departments within HCC, and conduct NDMO-led training with WDCs.	9.1, 10.2, 10.4	✓	✓	✓	Medium Term	High	$$$$	OPMC/ NDMO/ HCC
HCA9.7 Initiate a DRR awareness programme in schools.	7.7, 9.1, 9.2	✓	✓	✓	Medium Term	High	$$$$	HCC / Police and Fire Brigade
HCA9.8 Set aside a day for Honiara-wide disaster response exercises.	9.3, 9.5, 9.6, 7.2	✓	✓	✓	Medium Term	High	$$$$	HCC / Police and Fire Brigade

4.1.10 GOVERNANCE AND PARTNERSHIPS

Climate change does not respect boundaries and requires multi-sectoral actions, therefore horizontal and vertical integration of policies and actions is critical. A governance structure that ensures planning, implementation and monitoring of the implementation of this action plan will be critically important.

10. City-wide Actions: Governance & Partnerships	Object-ive(s)	Resilience Area(s)			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
HCA10.1 Constitute a multi-stakeholder steering group for implementation of the HURCAP, including core members from HCC, MLHS, MECDM and Guadalcanal province as well as implementing partners and other key stakeholders. To also involve regular public – private discussions of opportunities.	1.3, 10.2, 10.4	✓	✓	✓	Short term	High	$$$$	OPMC/ HCC/ MECCDM/ MLHS/ GProv.
HCA10.2 Ensure vertical governance through engagement with Ward Advisory Groups and Ward Councillors as well as sub-ward structures such as Community Development Councils.	1.3, 10.1	✓	✓	✓	Medium Term	Low	$$$$	SINSO/ MLHS/ UNH/ HCC
HCA10.3 Develop a formal mechanism for managing cross-boundary urban resilience issues between Guadalcanal province and HCC.	1.1, 1.3, 8.1, 10.3, 10.4	✓	✓	✓	Short Term	Med	$$$$	HCC/ GProv / MLHS
HCA10.4 Develop transparent information systems for HURCAP funding and implementation, as well as M&E and engage Transparency Solomon Islands (TSI).	7.1, 7.5, 10.4, 10.7	✓	✓	✓	Medium Term	High	$$$$	OPMC/ TSI
HCA10.5 Develop a climate change resilience upskilling programme for ward councillors, community leaders and engaged stakeholders.	8.4, 10.3, 10.4	✓	✓	✓	Medium Term	Med	$$$$	
HCA10.6 Develop climate change training and knowledge exchange programmes between HCC staff and urban municipalities.	10.1, 10.2, 10.4	✓	✓	✓	Medium Term	Low	$$$$	
HCA10.7 Scope donor country options for funding support and volunteer positions in DRR and Urban Climate Resilience related portfolios within HCC departments.	10.1, 10.2, 10.4	✓	✓	✓	Short Term	Med	$$$$	
HCA10.8 Create a formal procedure engaging non-government actors and representatives in all HURCAP actions, including civil society, women, youth, churches and disability organisations.	10.1, 10.2,10.4, 10.7	✓	✓	✓	Short Term	High	$$$$	HCC/ DSE/ Churches/ Youth/ Women

HCA10.9 Develop a professional training programme for planners and other urban and related professionals in support of this action plan.		✓	✓	✓	Medium Term	Med	$$$$	SINU MLHS
HCA10.10 Develop a training programme for climate change programme management including M&E for mid-level management in partnering institutions.		✓	✓	✓	Medium Term	Med	$$$$	
HCA10.11 Develop city-to-city partnerships in particular within the Capital Cities partnership.		✓	✓	✓	Medium Term	Med	$$$$	HCC/ other Melanesian Capitals, Australian and NZ cities
HCA10.12 Mainstream Climate Change into all Honiara legislation, plans, policies and programmes in particular the corporate plan and relevant bi-laws.		✓	✓	✓	Medium Term	Med	$$$$	HCC/

4.2 WARD LEVEL ADAPTATION PROFILES & ACTIONS

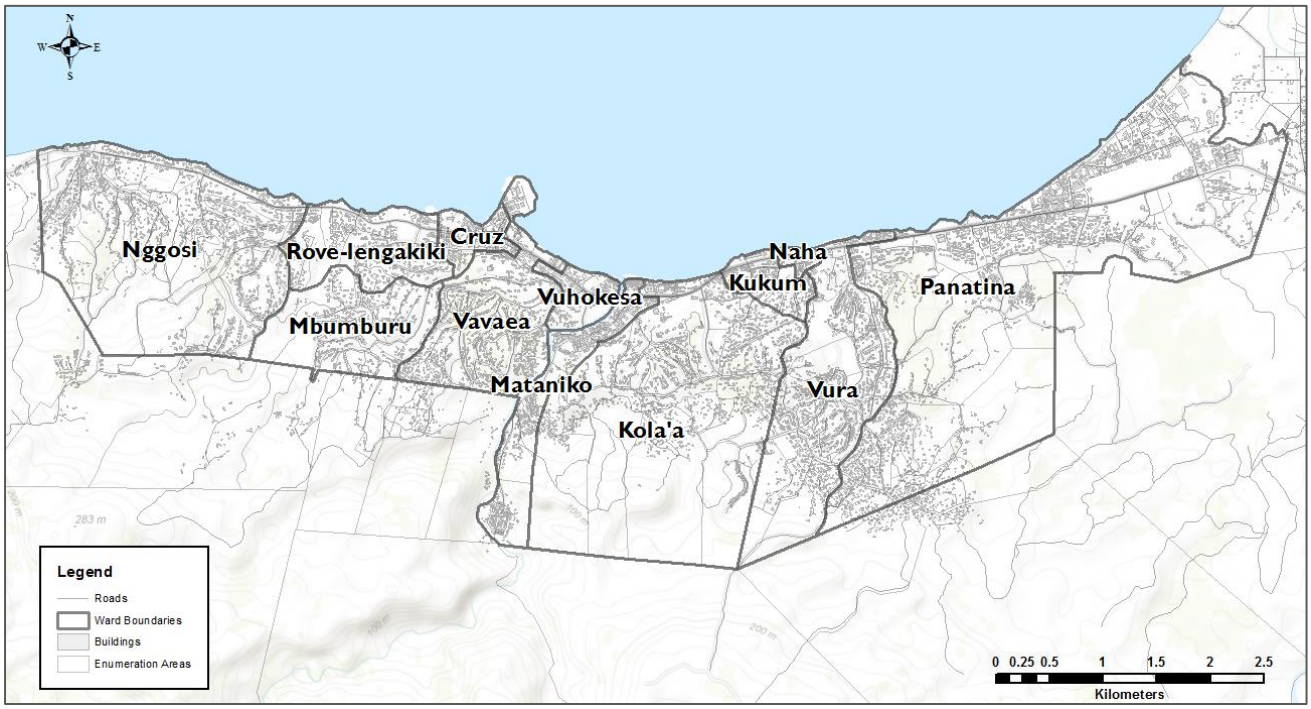

Figure 48: Ward divisions across Honiara City

As noted earlier in this Action Plan, the 12 Honiara City Wards provide a critical structure for implementing adaptation actions both internally within HCC, and externally as the key mechanism for engaging with established community-level committees and social groupings. In particular, continued efforts to enhance Ward Development Committees will provide a valuable bridge between local government departments and community-level stakeholders.

This section of the HURCAP is intended to provide both an overview of each of the 12 wards, and also to illustrate ward-specific actions that can be undertaken in partnership with WDCs. This includes workshopped ward-level outputs from the Honiara Urban Resilience and Adaptation Forum, which were completed for six wards (Kukum, Mataniko, Mbumburu, Panatina, Vavaea and Vura) by ward councillors, community representatives and government and civil society experts (as shown in Figure 49). Possible actions are also listed for the remaining wards though additional adaptation planning workshops with community, business, and expert stakeholders are needed to elicit the input that is needed to develop informed locally-owned action plans.

Figure 49: Honiara Urban Resilience and Adaptation Forum Ward Break-out Activities (August 2015)

4.2.1 NGGOSI WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Nggossi	Comparative HCC Statistic
Total Land Area	3.8 km^2	23.5 km^2
Population (2009)	9690	62960
Population Density	2586 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	5.7% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	25.4%	28.4%
Share of land informally settled	17.5%	14.4%
Average population density of ISZs	3753 persons / km^2	5275 persons / km^2
Rates of home ownership	43.0%	38.2%
Housing with traditional or makeshift roofing	23.6%	18.3%
Demographics		
Population classified as youth (0-25)	56.7%	56.3%
Population classified as children (0-15)	33.1%	32.1%
Access to Utilities/Services		
Households with metered water	82.2%	75.4%
Households with sealed sanitation	78.6%	82.7%
Households with electricity	53.6%	64.4%
Households with one or more mobile phone	72.2%	76.9%
Households with internet access	6.7%	4.1%
Livelihoods		
Households dependent on wage-based income	71.8%	77.8%
Households growing their own food	47.7%	40.5%
Households fishing on a regular basis	14.7%	8.2%

Figure 50: Nggosi Ward – Key Statistics and City Comparison

Nggosi Ward covers one-sixth of Honiara by land area, bordering Guadalcanal province on the city's western boundary and traversing the entire North-South extent of HCC, rising from the Ironbottom Sound coastline into the Guadalcanal foothills. Around 15% of the city's population resided in the ward in 2009, however the ward is growing rapidly; over the decade preceding 2009 it grew annually in population by approximately 5.7%, more than twice the city's rate as a whole (as can be seen in Figure 50). The ward also houses a similar proportion of the city's informal population – an estimated 2510 people, who live in the valleys in the western half of the ward area. These ISZs are, however, less densely populated than elsewhere in Honiara.

The presence of large areas of housing in the ward's east, largely occupied by ex-pat and foreign tenants, creates a wide range of conditions in the ward area, with contrasting rates of utility and services access not reflected in the whole-of-ward statistics shown in Figure 50. Only half of the households in the ward have access to electricity (below Honiara's average rate of closer to two-thirds), while internet access rates are higher (in large part due to the eastern ex-pat housing zone). Rates of fishing and food production are also higher than average, though in the ward's western informally settled zones.

Nggosi Ward-specific Actions

Nggosi ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading. The first action recommended for this ward area is to complete the ward-level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat. Further ward-level actions are proposed below, and are spatially referenced in the map in Figure 51.

W1.1 Develop a tsunami and tropical cyclone warning system and evacuation programme in partnership with coastal communities and the NDMO.

- As shown in Figure 50 a large number of coastal residents inhabit a high risk zone for inundation. A specific plan for this hazard exposure hotspot needs to be developed to ensure the safe evacuation of these citizens in the event of a storm surge or tsunami wave.

W1.2 Establish a working group to manage cross-border population growth into Guadalcanal province, as well as dependency on local springs and bore holes for water.

- The dependence of the water supply for the local ISZs' drinking and washing water is extremely high in the western section of this ward, and SIWA identified these bore holes as being at critical risk from encroachment, particularly due to the lack of sealed sanitation in these encroaching settlements.

W1.3 Conduct a study of households and housing structures living within the river floodplain.

- More data is required to determine the high risk flood zones in the White River riparian area.

W1.4 Establish an upgrading programme for the White River Informal Settlement Zones

- As part of ongoing PSUP work the formalisation of those ISZ structures outside of service access routes and hazard zones will allow connection of utilities and better construction standards, reducing climate sensitivity.

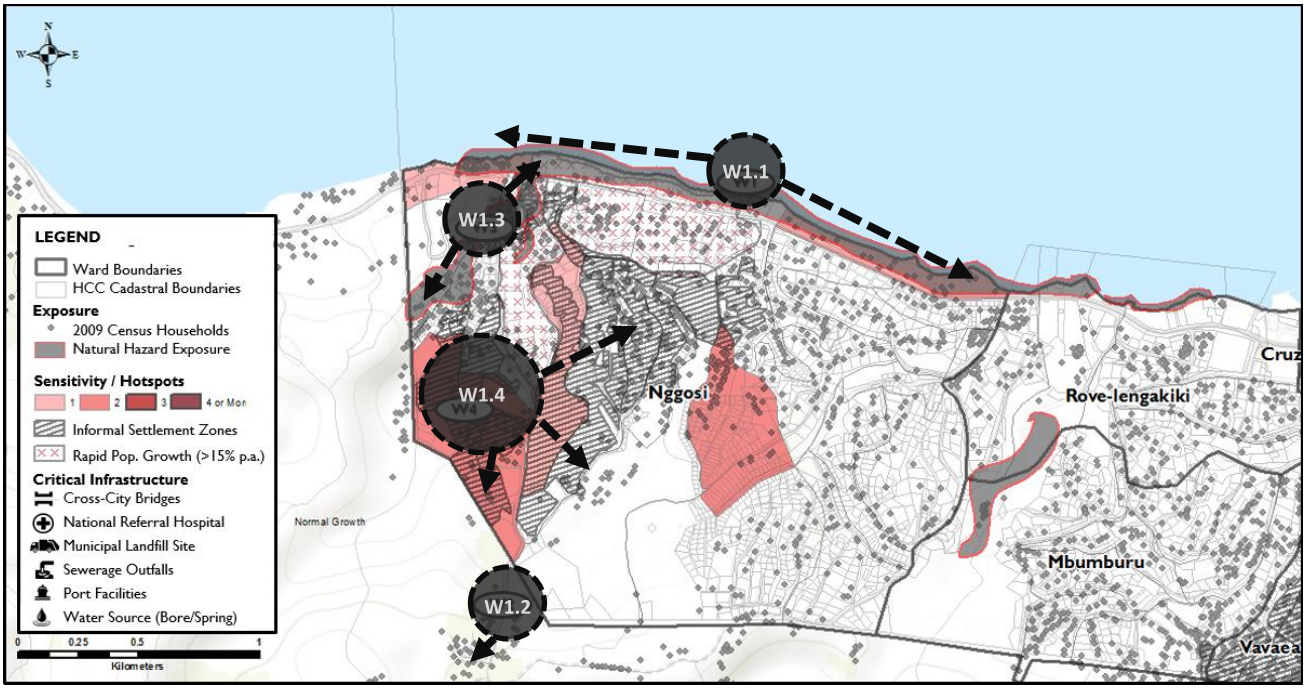

Figure 51: Nggosi Ward-specific Actions and Vulnerability Profile

4.2.2 ROVE-LENGAKIKI WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Rove-Lengakiki	Comparative HCC Statistic
Total Land Area	1.0 km^2	23.5 km^2
Population (2009)	2336	62960
Population Density	2388.4 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	0.7% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	0.0%	28.4%
Share of land informally settled	0.0%	14.4%
Average population density of ISZs	N/A	5275 persons / km^2
Rates of home ownership	27.5%	38.2%
Housing with Traditional or Makeshift Roofing	6.6%	18.3%
Demographics		
Population classified as youth (0-25)	53.5%	56.3%
Population classified as children (0-15)	30.0%	32.1%
Access to Utilities/Services		
Households with metered water	68.9%	75.4%
Households with sealed sanitation	98.2%	82.7%
Households with electricity	90.1%	64.4%
Households with one or more mobile phone	79.0%	76.9%
Households with internet access	6.6%	4.1%
Livelihoods		
Households dependent on wage-based income	85.0%	77.8%
Households growing their own food	43.7%	40.5%
Households fishing on a regular basis	15.9%	8.2%

Figure 52: Rove-Lengakiki Ward – Key Statistics and City Comparison

Housing 2336 residents and covering approximately one square kilometre, Rove-Lengakiki is one of the city's most stable wards with no informal settlement zones and a population growth rate well below the Honiara average at 0.7% per annum (see Figure 52). It has a low rate of home ownership, but almost all households have sealed sanitation facilities and electricity. Internet access and mobile phone ownerships are above the city average, however connectivity to metered water is lower than elsewhere in Honiara.

Almost double the percentage of residents living within Rove-Lengakiki participate in fishing relative to the rest of Honiara, however 85% of the ward's households depend on wage-based income, reflecting extensive areas of government housing and ex-pat rental stock.

Rove-Lengakiki Ward-specific Actions

Rove-Lengakiki ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading.

The first action recommended for this ward area is to complete the ward level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat. Additional recommended ward-level actions are as follows:

W2.1 Rehabilitate and/or relocate the sewer outfall as part of a city-wide outfall upgrade programme.

- As identified elsewhere in this Action Plan the outfalls into Ironbottom Sound are in a state of disrepair and allow raw sewerage to enter the ocean at the coastline.

W2.2 Investigate at-risk housing located on sloped and unstable areas, taking into account the nearby water source and the new Land Use Planning Scheme regulations for construction on areas steeper than 45 degrees.

- Although sparsely populated, a significant area of the ward was identified in earlier analysis to be at high risk of landslides. These areas, and others with a significant gradient, should be mapped out using a digital elevation model for further investigation and housing in these zones assessed by engineers.

W2.3 Develop a tsunami and tropical cyclone warning system and evacuation programme in partnership with coastal businesses and the NDMO.

- Non-residential areas along the coastline include recreational facilities and hotels, which require different approaches in the development of tsunami and storm surge evacuation plans and warning systems.

W2.4 Investigate the potential for creating public open and green space with waterfront access as part of rehabilitation of government building sites.

- In all stakeholder consultations the lack of publicly accessible waterfront and open space was seen as a key limit to the city, and would benefit local residents, boost tourism opportunities, and provide a natural buffer from climate risks through ecosystem-based adaptation and climate-sensitive design.

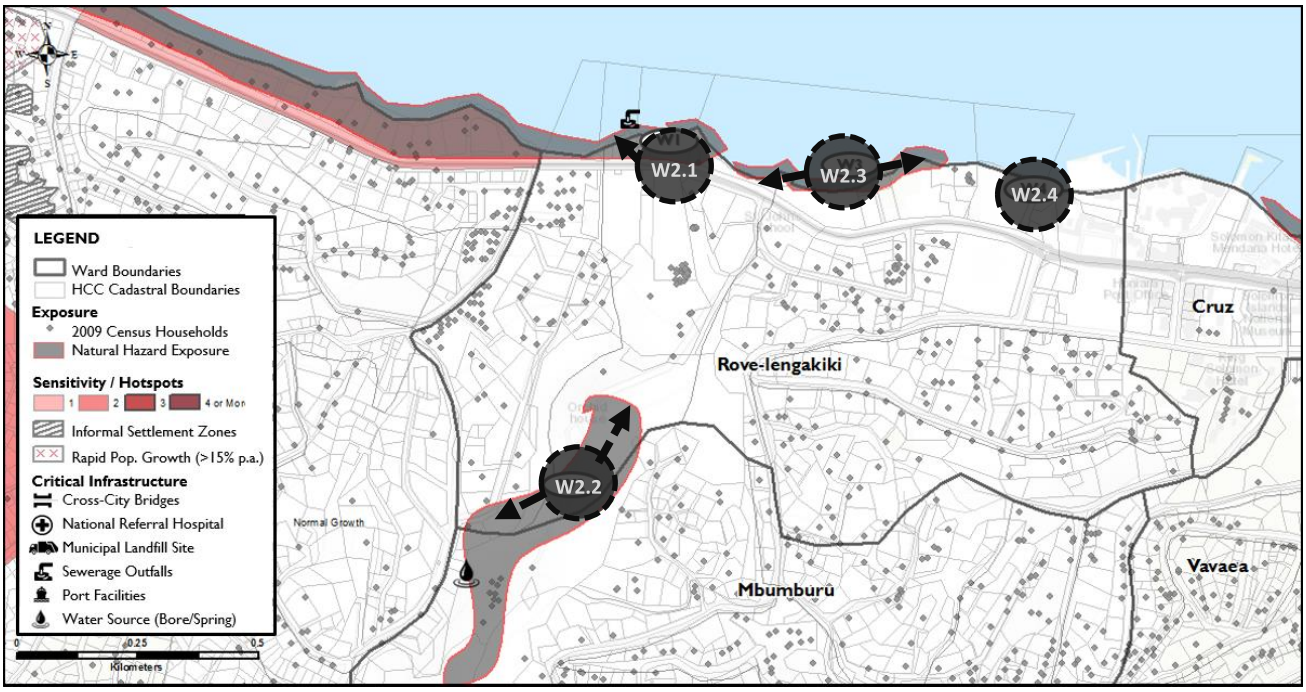

Figure 53: Rove-Lengakiki Ward-specific Actions and Vulnerability Profile

4.2.3 MBUMBURU WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Mbumburu	Comparative HCC Statistic
Total Land Area	1.2 km^2	23.5 km^2
Population (2009)	3581	62960
Population Density	2940.3 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	5.0% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	0.9%	28.4%
Share of land informally settled	0.5%	14.4%
Average population density of ISZs	6127.7 persons / km^2	5275 persons / km^2
Rates of home ownership	32.0%	38.2%
Housing with Traditional or Makeshift Roofing	17.2%	18.3%
Demographics		
Population classified as youth (0-25)	55.0%	56.3%
Population classified as children (0-15)	30.%	32.1%
Access to Utilities/Services		
Households with metered water	78.0%	75.4%
Households with sealed sanitation	80.1%	82.7%
Households with electricity	68.4%	64.4%
Households with one or more mobile phone	86.5%	76.9%
Households with internet access	5.6%	4.1%
Livelihoods		
Households dependent on wage-based income	80.1%	77.8%
Households growing their own food	47.0%	40.5%
Households fishing on a regular basis	5.1%	8.2%

Figure 54: Mbumburu Ward – Key Statistics and City Comparison

Mbumburu is an inland ward which houses around 6% of Honiara's total population, but is one of the city's fastest growing areas due to significant unoccupied areas of developable land on the ward's south-eastern boundary. The ward's inhabitants have slightly higher than average levels of utilities and services access, higher rates of household gardening, but lower rates of fishing commensurate with their inland location.

The ward contains very small areas of officially classified Informal Settlement Zones, encompassing less than half a percent of Mbumburu's land area. However, settlement issues are understood to exist around the local water source and bore hole area. Mbumburu also contains an area of high landslide risk on which a number of houses are located.

Mbumburu Ward-specific Actions

Proposed adaptation and resilience-building actions for Mbumburu Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor,

community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

W3.1 Conduct community consultations on use of the local water source and create a protective zone determining appropriate use within its catchment area.

- Given the ward's above average population growth, the long-term protection of one of the city's key water sources is critical, and requires local community engagement and ownership.

W3.2 Investigate at-risk housing located on sloped and unstable areas, taking into account the nearby water source and the new Land Use Planning Scheme regulations for construction on areas steeper than 45 degrees.

- Landslide studies are out of date and can be improved in terms of detail and relevance to the new clauses present in the Land Use Planning Scheme through application of existing data (Honiara Digital Elevation Model).

W3.3 Profile cross-border growth into Guadalcanal province, and manage customary leasing arrangements with local communities.

- Given the previous social tensions and unrest resulting from encroachment of city residents into customary land areas, managing the relationships beyond the formal city boundary in partnership with Guadalcanal Province and the National Solomon Islands Government is critical to ensure stability and security in Honiara.

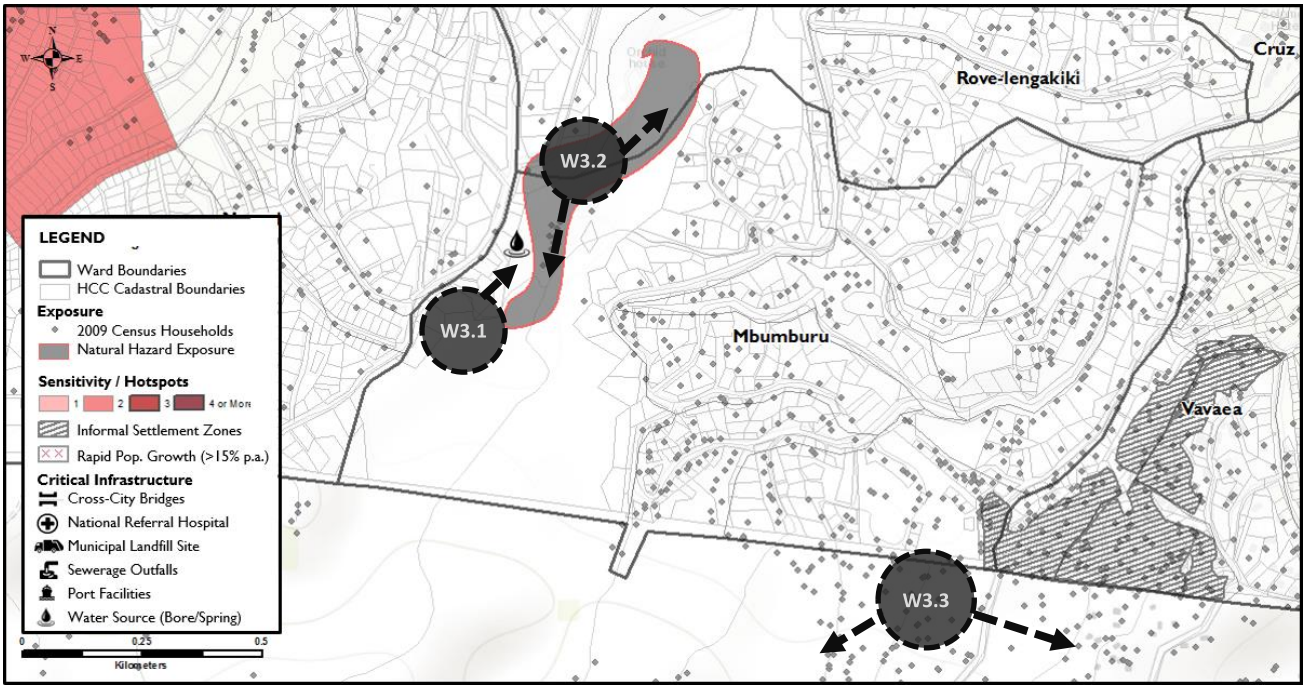

Figure 55: Mbumburu Ward-specific Actions and Vulnerability Profile

4.2.4 CRUZ WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Cruz	Comparative HCC Statistic
Total Land Area	0.3 km^2	23.5 km^2
Population (2009)	98	62960
Population Density	416.8 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	-6.3% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	0.0%	28.4%
Share of land informally settled	0.0%	14.4%
Average population density of ISZs	N/A	5275 persons / km^2
Rates of home ownership	5.9%	38.2%
Housing with Traditional or Makeshift Roofing	5.9%	18.3%
Demographics		
Population classified as youth (0-25)	34.9%	56.3%
Population classified as children (0-15)	17.7%	32.1%
Access to Utilities/Services		
Households with metered water	100.0%	75.4%
Households with sealed sanitation	100.0%	82.7%
Households with electricity	100.0%	64.4%
Households with one or more mobile phone	76.5%	76.9%
Households with internet access	17.6%	4.1%
Livelihoods		
Households dependent on wage-based income	76.5%	77.8%
Households growing their own food	70.6%	40.5%
Households fishing on a regular basis	17.6%	8.2%

Figure 56: Cruz Ward – Key Statistics and City Comparison

A summary of the profile of Cruz ward is shown above in Figure 56. At only 0.3 km^2 Cruz is the second smallest ward even though it comprises the city's central business district, it contained only 98 permanent residents in the 2009 census, 170 less than in 1999.

There are no informal settlements within Cruz ward, and the area has full access to utilities and the highest rate of household internet access in the city. Home ownership, however, is extremely low (5.9% of households), with lower than average youth and child population levels.

Other notable features of the ward include a portion of the port area and recreational berths, a number of the city's major hotels, the central bank, ministries and the police headquarters.

Cruz Ward-specific Actions

Cruz ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading.

The first action recommended for this ward area is to complete the ward level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat. Other ward-level actions identified through stakeholder workshops and expert consultations include:

W4.1 Identify areas for street tree planting to beautify the main street through the CBD, with the aim of shading pedestrian areas and improving stormwater absorption.

- A number of participants recalled earlier streetscapes along the Kukum Highway that provided shade and points of interest for visitors to the city. These also have the potential to reduce rainfall run-off in heavy rain events, and reduce air pollutants from traffic.

W4.2 Explore the potential for public access open space creation through Port rehabilitation works as part of buffering from storm surge damage. Include rehabilitation works for the sewer outfall.

- Modifications have been proposed for much of the port area to integrate a level of public waterfrontage in the CBD – in the short term, this access could be provided on the western edge of Point Cruz with minimal disruption to the Port Authority. This could also improve inundation risk through incorporation of ecosystem-based adaptation options such as mangroves and floodable areas.

W4.3 Analyse drainage issues and localised flooding on streets in the CBD area, both in terms of traffic disruption and pedestrian access.

- No mapping has been undertaken of localised flooding issues in the city. This would allow targeted drainage improvement works and project funding submissions to donors.

W4.4 Extend street planting, drainage remediation works and improved pedestrian access to secondary roads in the CBD area.

- Beyond the Kukum highway, key pedestrian routes could be enhanced by covering open drains with footpaths, improving safety and disability access, while also encouraging alternative low-emissions forms of commuting.

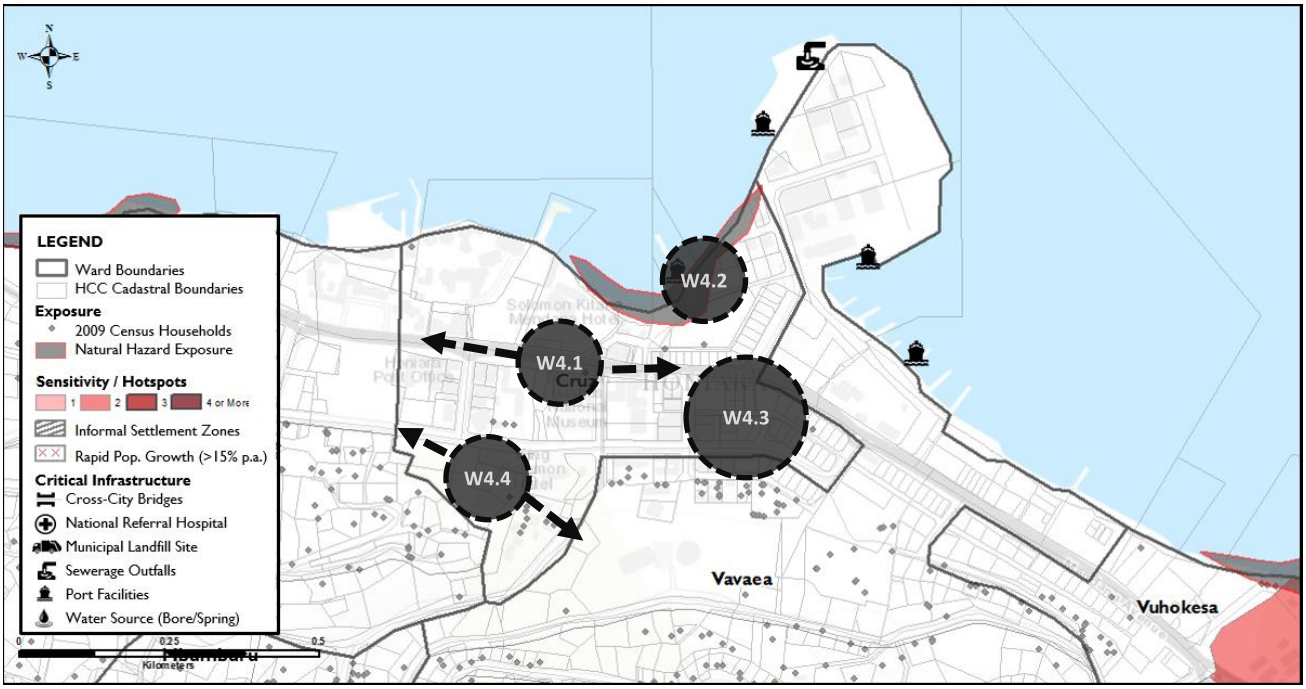

Figure 57: Cruz Ward-specific Actions and Vulnerability Profile

4.2.5 VAVAEA WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Vavaea	Comparative HCC Statistic
Total Land Area	1.5 km^2	23.5 km^2
Population (2009)	6767	62960
Population Density	4434.5 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	0.1% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	29.7%	28.4%
Share of land informally settled	17.8%	14.4%
Average population density of ISZs	7419.7 persons / km^2	5275 persons / km^2
Rates of home ownership	31.3%	38.2%
Housing with Traditional or Makeshift Roofing	18.8%	18.3%
Demographics		
Population classified as youth (0-25)	54.9%	56.3%
Population classified as children (0-15)	30.6%	32.1%
Access to Utilities/Services		
Households with metered water	79.6%	75.4%
Households with sealed sanitation	95.8%	82.7%
Households with electricity	64.8%	64.4%
Households with one or more mobile phone	77.6%	76.9%
Households with internet access	4.0%	4.1%
Livelihoods		
Households dependent on wage-based income	79.0%	77.8%
Households growing their own food	25.9%	40.5%
Households fishing on a regular basis	6.4%	8.2%

Figure 58: Vavaea Ward – Key Statistics and City Comparison

Vavaea is a diverse ward, including the industrial port area, stevedoring and fuel depot zones, the Honiara central market, and an extensive residential area extending southward to the Guadalcanal border. It is also one of the city's most densely populated wards, housing over 10% of Honiara's population in only 1.5km^2. This large area is, however, relatively stable in terms of population change, growing at an average of only 0.1% per year between 1999 and 2009.

Almost a third of Vavaea's population lives in ISZs, much of which were destroyed in the April 2014 floods (the ward includes the Koa Hill area on the western bank of the Mataniko River). These areas are extremely densely populated, and are growing across the border into Guadalcanal Province on the ward's south-western boundary. Access to utilities and services are broadly consistent with the rest of Honiara, with the exception of high rates of improved sanitation. The absence of surveyed household points in the Koa Hill area in the 2009 census, however, suggests that ISZ inhabitants may not be sufficiently represented in this data (see Figure 61).

Vavaea Ward-specific Actions

Proposed adaptation and resilience-building actions for Vavaea Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor, community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

W5.1 Develop a medium-term plan for relocating fuel tanks away from the CBD, including site remediation and creation of a public recreational space.

- This site has the potential to be transformed into a key community asset with rehabilitation works, and at present may be a key risk during a tropical cyclone event.

W5.2 Create a long-term plan for flood-sensitive use of the Koa Hill area destroyed in the April 2014 floods, such as sports fields or community gardens.

- Informal settlements are already encroaching on the floodplain area. Without an appropriate use, developed in partnerships with the community, the same risk to housing a lives is likely to repeat during the next severe storm event.

W5.3 Develop a community engagement programme with informal settlements adjacent to the floodplain to communicate flood risk and prevent further settlement in at-risk areas.

- Linked to W5.2, an ongoing engagement strategy with adjacent households is critical, employing tools such as FTE and the UN-Habitat Participatory Slum Upgrading Programme (PSUP).

W5.4 Profile the cross-border informal settlement and manage customary leasing arrangements with local communities and Guadalcanal Province.

- Engagement in partnership between Guadalcanal Province, HCC and community leaders.

W5.5 Conduct a localised climate risk assessment of the Honiara Central market, and consult with traders on interest in decentralised market options across the city.

- The market provides a critical source of food, income and employment for residents of the city.

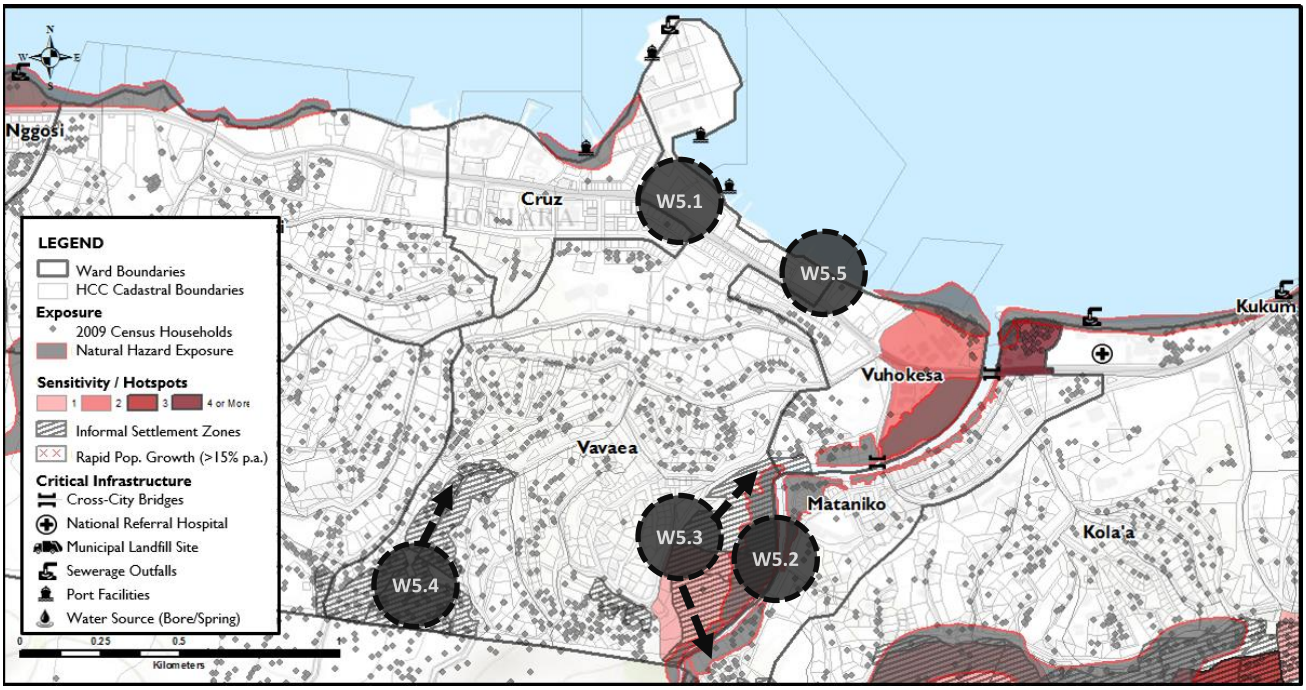

Figure 59: Vavaea Ward-specific Actions and Vulnerability Profile

4.2.6 VUHOKESA WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Vuhokesa	Comparative HCC Statistic
Total Land Area	0.3 km^2	23.5 km^2
Population (2009)	1104	62960
Population Density	3888.3 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	0.3% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	0.7%	28.4%
Share of land informally settled	1.8%	14.4%
Average population density of ISZs	1466.8 persons / km^2	5275 persons / km^2
Rates of home ownership	33.1%	38.2%
Housing with Traditional or Makeshift Roofing	17.6%	18.3%
Demographics		
Population classified as youth (0-25)	57.0%	56.3%
Population classified as children (0-15)	32.0%	32.1%
Access to Utilities/Services		
Households with metered water	95.3%	75.4%
Households with sealed sanitation	64.2%	82.7%
Households with electricity	48.0%	64.4%
Households with one or more mobile phone	66.9%	76.9%
Households with internet access	2.7%	4.1%
Livelihoods		
Households dependent on wage-based income	67.6%	77.8%
Households growing their own food	31.0%	40.5%
Households fishing on a regular basis	24.3%	8.2%

Figure 60: Vuhokesa Ward – Key Statistics and City Comparison

Vuhokesa ward is one of Honiara's smallest in terms of land area, however unlike Cruz ward includes a substantial permanent population numbering over 1100 people. Although only a small area of the ward is classified as an ISZ, the western bank of the Mataniko river also contains a growing area of informal housing in an area that is highly vulnerable to coastal erosion and inundation, as well as upstream and coastal water pollution.

Only two-thirds of the ward's households have access to sealed sanitation, and less than half have electricity wired to the premises. Internet and mobile access are also well below averages elsewhere in the city. Almost a quarter of Vuhokesa households fish, while a lower than average number of households grow their own food. Further ward-level statistics are provided in Figure 60.

The ward contains a number of significant churches and the city cathedral, the Honiara City Council chambers, the main bus pick-up area and interchange, and the Solomon Water headquarters and depot. Both major bridges across the Mataniko River, which dissects the city, are located on the ward's eastern boundary, with flood plains lying in between.

Vuhokesa Ward-specific Actions

Vuhokesa ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading.

The first action recommended for this ward area is to complete the ward level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat. Additional actions, based on expert input and workshops, include:

W6.1 Engage the waterfront informal settlement in a consultative process similar to other hotspot zones, identifying community priorities and key vulnerabilities.

- To be conducted in partnership with UN-Habitat, MLHS and the landowners, building on the experiences of the local community and their established social structures. Discuss potential for a relocation programme.

W6.2 Formalise protection of the floodplain area on the west bank of the Mataniko in partnership with the Physical Planning Division of MLHS and HCC.

- Including examination of the impact of bank modification on the waterfront housing of Chinatown, and downstream settlements at the river mouth.

W6.3 Integrate debris modelling and improved pedestrian access to the ongoing upgrading of the bridge as a critical cross-city alternative during flood events.

- With this bridge to provide a critical secondary cross-city river crossing, consideration of the high amount of pedestrian traffic dependent on the cross should be integrated into planning for its duplication.

W6.4 Conduct Water Quality Monitoring on an ongoing basis.

- To ensure the safety of settlement dwellers downstream at the river mouth.

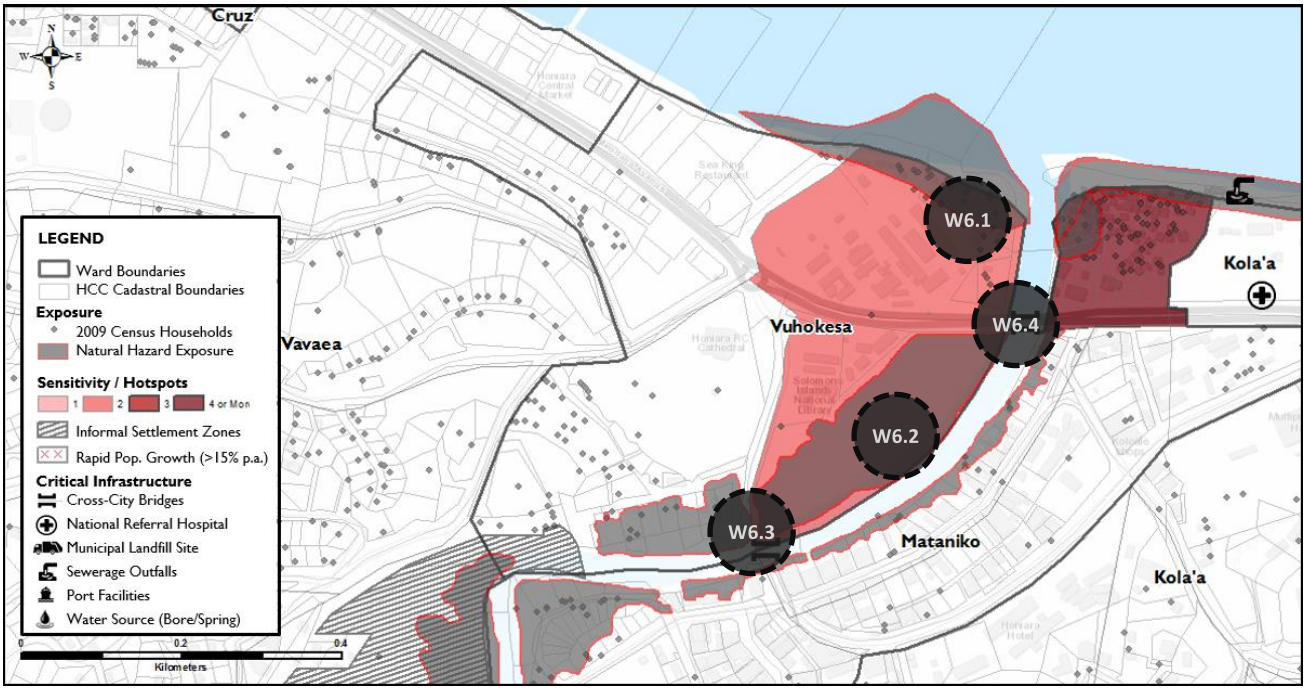

Figure 61: Vuhokesa Ward-specific Actions and Vulnerability Profile

4.2.7 MATANIKO WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Mataniko	Comparative HCC Statistic
Total Land Area	0.8 km^2	23.5 km^2
Population (2009)	4192	62960
Population Density	5111.7 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	4.5% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	19.5%	28.4%
Share of land informally settled	11.0%	14.4%
Average population density of ISZs	9044.6 persons / km^2	5275 persons / km^2
Rates of home ownership	43.7%	38.2%
Housing with Traditional or Makeshift Roofing	21.0%	18.3%
Demographics		
Population classified as youth (0-25)	55.5%	56.3%
Population classified as children (0-15)	33.4%	32.1%
Access to Utilities/Services		
Households with metered water	75.3%	75.4%
Households with sealed sanitation	73.8%	82.7%
Households with electricity	67.2%	64.4%
Households with one or more mobile phone	77.5%	76.9%
Households with internet access	2.2%	4.1%
Livelihoods		
Households dependent on wage-based income	75.8%	77.8%
Households growing their own food	33.8%	40.5%
Households fishing on a regular basis	6.8%	8.2%

Figure 62: Mataniko Ward – Key Statistics and City Comparison

Mataniko ward traverses the eastern bank of the Mataniko River from the southern Honiara boundary with Guadalcanal province to the northern coastline along Ironbottom Sound. Housing around 7% of the city's population, Mataniko is also one of the most densely populated wards; at 5112 inhabitants per kilometre squared it has a population density twice the rest of the city. Almost 10% of land is classified as informal: 9045 persons/km^2.

At the river mouth, Ontong Java Settlement extends from the Kukum Highway to the boundary of the National Referral Hospital, facing pressures from coastal erosion and riverine flooding. Chinatown, which provides commercial and light industrial services for the city and houses a number of civil society organisations, is limited in terms of space but has severe exposure to flood damage, as demonstrated in the April 2014 floods.

Informal settlements in the centre of the ward lack road access and sit on the juncture of the river and eastern tributaries that carry waste and effluent downstream from informal settlements in neighbouring Kola'a. Sewer outfalls into the river on the ward's western edge are other key infrastructure features, with a water source on the southern boundary with Guadalcanal province.

Mataniko Ward-specific Actions

Proposed adaptation and resilience-building actions for Mataniko Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor, community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

Additional input has been provided based on critical infrastructure analysis and hazard exposure data, with further actions developed by expert stakeholders and the UN-Habitat team.

W7.1 Examine structural risks to Chinatown trader buildings along the eastern bank of the Mataniko River for future flood events.

- Extensive damage to riverbank structures in Chinatown remains evident following the April 2014 floods. A review of the current regulations for this waterfront zone, as well as a structural assessment of existing properties, should be conducted given the critical role of the downstream bridge.

W7.2 Integrate consideration of climate risks (heat, flooding and landslide) into Slum Upgrading Programme initiatives in the ISZ.

- A focus on granting ToL and FTE outside of high risk hazard zones, in addition to utility and road access.

W7.3 Conduct a study of the sewerage outfalls and explore options to treat or pipe downstream.

- With extensive housing along the river downstream, these outfalls are no longer appropriately located.

W7.4 Develop a protection plan for the local water source from encroaching urban growth, including an engagement plan with local informal communities.

- Potential to follow models such as the Tagabe Watch Catchment Management Committee in Port Vila. Explore opportunities to move the sourcing of water further upstream.

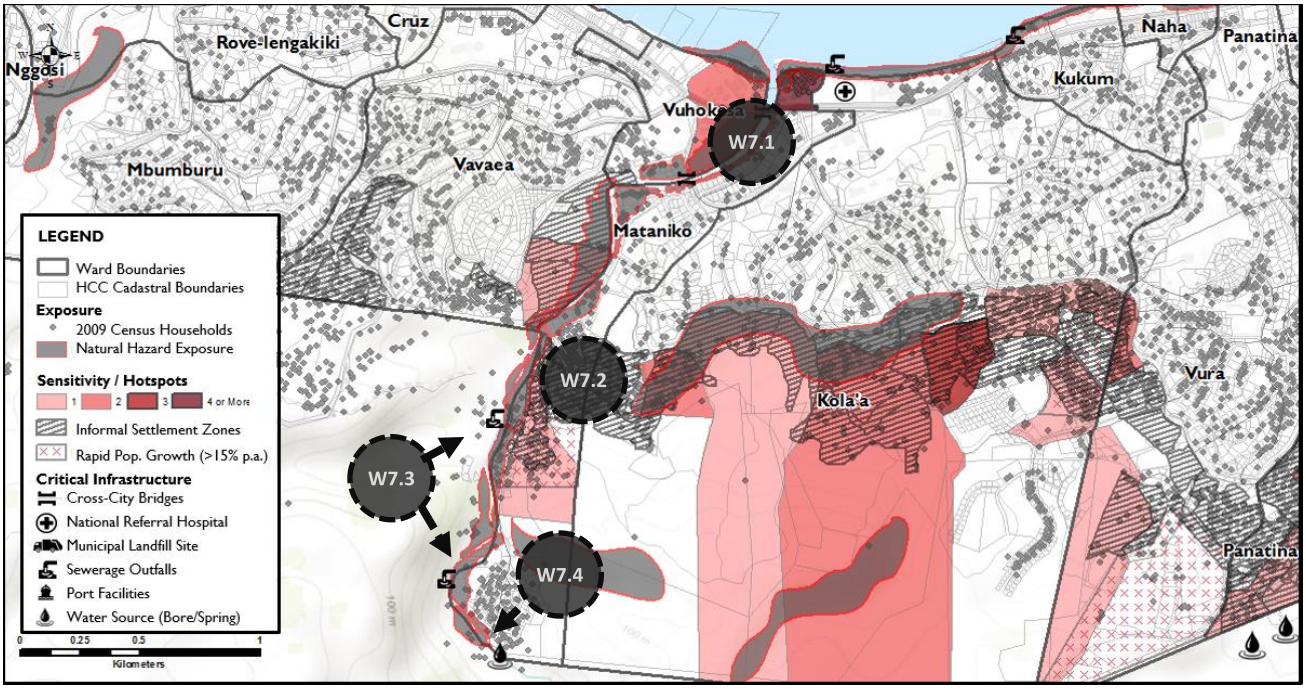

Figure 63: Mataniko Ward-specific Actions and Vulnerability Profile

4.2.8 KOLA'A WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Kola'a	Comparative HCC Statistic
Total Land Area	4.9 km^2	23.5 km^2
Population (2009)	9857	62960
Population Density	2001.5 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	3.5% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	39.9%	28.4%
Share of land informally settled	16.5%	14.4%
Average population density of ISZs	4828.7 persons / km^2	5275 persons / km^2
Rates of home ownership	47.7%	38.2%
Housing with Traditional or Makeshift Roofing	22.3%	18.3%
Demographics		
Population classified as youth (0-25)	56.9%	56.3%
Population classified as children (0-15)	32.2%	32.1%
Access to Utilities/Services		
Households with metered water	75.7%	75.4%
Households with sealed sanitation	84.4%	82.7%
Households with electricity	61.4%	64.4%
Households with one or more mobile phone	75.7%	76.9%
Households with internet access	4.4%	4.1%
Livelihoods		
Households dependent on wage-based income	80.5%	77.8%
Households growing their own food	38.8%	40.5%
Households fishing on a regular basis	4.1%	8.2%

Figure 64: Kola'a Ward – Key Statistics and City Comparison

Kola'a ward contains one-fifth of Honiara's land area and 16% of its population, including some of its most climate-vulnerable households (the Aekafo Planning area, for example, as shown in Figure 65). A relatively low overall ward density due to large areas of unoccupied land in the ward's south masks an east-west band of ISZs which are severely deficient in infrastructure, prone to flooding and landslides, and are expanding rapidly. A number of new subdivisions are located along Kola'a's eastern boundary.

Levels of utilities access and livelihood sources closely match the city overall, with the exception of fishing rates which are below average. Key infrastructure in Kola'a ward includes the soon to be relocated National Referral Hospital, the Lawson Tama Stadium, and a series of springs which provide washing and drinking water to the ISZ communties.

Kola'a Ward-specific Actions

Kola'a ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading.

The first action recommended for this ward area is to complete the ward level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat. A number of hotspot-specific actions are not included here, as they are discussed in subsequent sections of the HURCAP. Expert identified ward-level actions are as follows:

W8.1 Hospital site development options to include waterfront access for public open space, green infrastructure.

- Including sewerage outfall upgrading and explore the opportunities for potential waterfront mangrove (or other suitable trees) planting.

W8.2 Analyse existing landslip risk, and develop maps of yet-to-be-developed areas with gradients >45°.

- Extensive informal housing is at risk in the Aekafo Planning Area, particularly in areas that are newly settled (post-April 2014). For yet-to-be-developed zones there is the potential to make prospective settlers understand that they won't be granted ToL in these areas in advance of housing establishment.

W8.3 Investigate funding and institutional resourcing for a health clinic for the area.

- Residents have identified a critical health services gap through workshops and the forum, with discussions to follow the National Referral Hospital relocation process.

W8.4 Re-establish an access road, including some housing relocation.

- The re-establishment of a road in the valley will allow waste removal, easier community access and introduction of utilities infrastructure such as electricity and piped water.

W8.5 Pilot low-cost sealed sanitation options and community-based river clean-up programme.

- With sewerage currently entering the water table and river, improved sanitation is critical for human health and well-being, both of the local population and those downstream in Mataniko Ward. Plastics pollution also creates a secondary environmental risk and is reducing water flow, leading to stagnation and vector-based disease exposure.

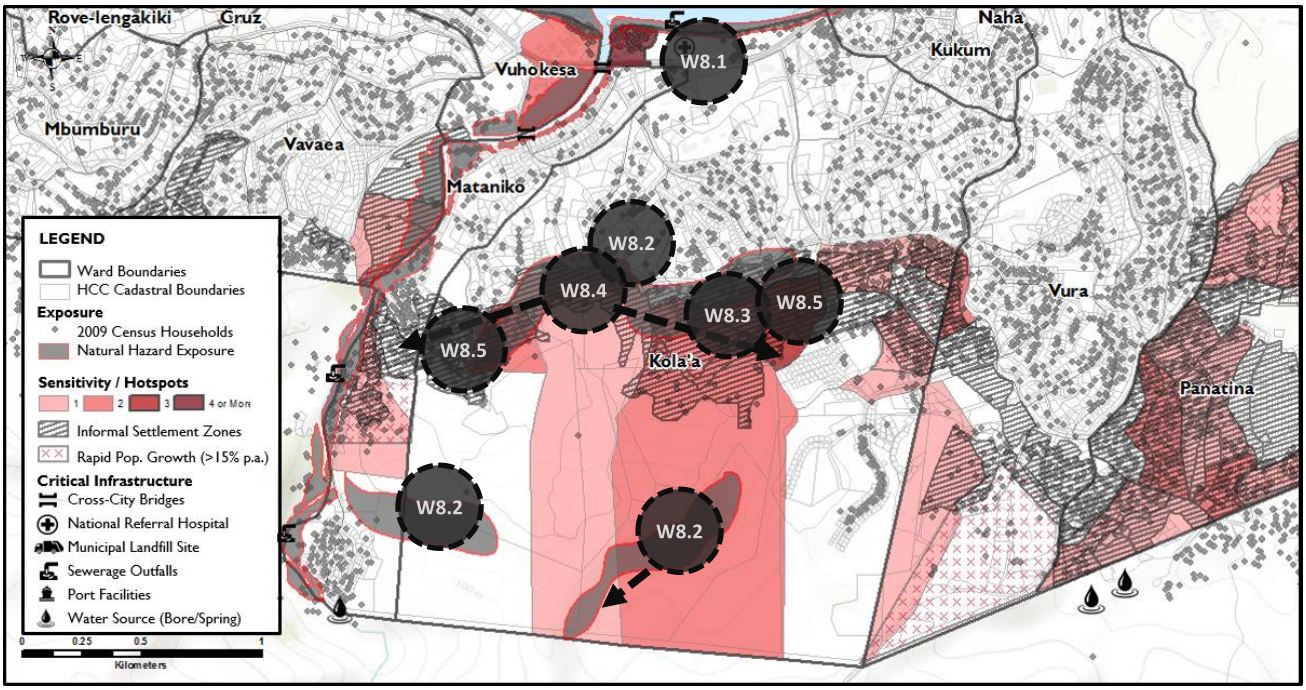

Figure 65: Kola'a Ward-specific Actions and Vulnerability Profile

4.2.9 KUKUM WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Kukum	Comparative HCC Statistic
Total Land Area	0.3 km^2	23.5 km^2
Population (2009)	1705	62960
Population Density	5189.1 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	-1.3% per year	2.7% per year
Informality, Housing & Tenure%		
Share of population living in ISZs	0.0%	28.4%
Share of land informally settled	0.0%	14.4%
Average population density of ISZs	N/A	5275 persons / km^2
Rates of home ownership	28.8%	38.2%
Housing with Traditional or Makeshift Roofing	2.1%	18.3%
Demographics		
Population classified as youth (0-25)	54.2%	56.3%
Population classified as children (0-15)	30.4%	32.1%
Access to Utilities/Services		
Households with metered water	87.6%	75.4%
Households with sealed sanitation	98.3%	82.7%
Households with electricity	91.4%	64.4%
Households with one or more mobile phone	83.3%	76.9%
Households with internet access	2.6%	4.1%
Livelihoods		
Households dependent on wage-based income	82.0%	77.8%
Households growing their own food	29.6%	40.5%
Households fishing on a regular basis	8.6%	8.2%

Figure 66: Kukum Ward – Key Statistics and City Comparison

At only 0.3km^2 Kukum ward is one of the smallest in Honiara, but also one of the highest in terms of population density. With no formally classified ISZs, the number of households with traditional or makeshift roofing is extremely low, and none of the enumeration areas in the ward cross any of the vulnerability thresholds (as shown in Figure 67).

Electrification, metered water access, and sealed sanitation rates are all well above the Honiara average (see Figure 66). In addition to a limited number of households, a number of businesses are located within the 'at risk' coastal zone. Sewer outfalls are also located at either end of the ward's coastline.

Rates of home ownership in the area are lower than elsewhere in the city (less than 30% of households), and the ward is currently reducing in overall population, reducing at an average of 1.3% per year between 1999 and 2009. Backyard food production rates are also below the overall Honiara averages.

Kukum Ward-specific Actions

Proposed adaptation and resilience-building actions for Kukum Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor, community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

Additional input has been provided based on critical infrastructure analysis and hazard exposure data, with further actions developed by expert stakeholders and the UN-Habitat team.

W9.1 Develop a commercial and business climate awareness and risk planning roundtable in partnership with SICCI.

- Private sector engagement stands to mutually benefit both the city and country as a whole through economic productivity, as well as the financial returns of the business community.

W9.2 Sewer outfall upgrades and pipe maintenance.

- As noted in other ward profiles the degradation of outfalls and piping is leading to septic intrusion across the city. These outfalls are less critical than others due to reduced proximity to residential areas dependent on the ocean for washing, bathing and recreation.

W9.3 Ongoing maintenance of the sea wall, with consideration of external erosion impacts.

- Potential to include hybrid ecosystem-based adaptation options and mangrove plantings.

W9.4 Sports field upgraded drainage, tree plantings and rubbish collection.

- Potential to provide rubbish collection point and recycling services for the wider community at these facilities.

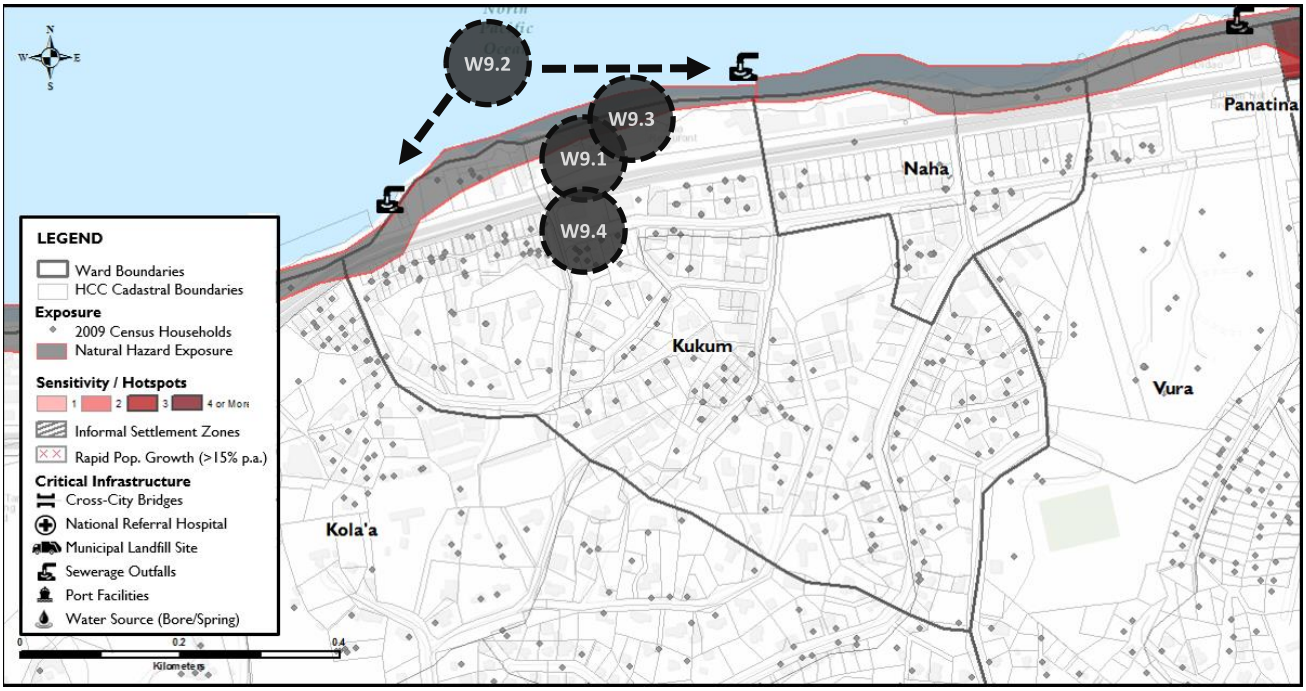

Figure 67: Kukum Ward-specific Actions and Vulnerability Profile

4.2.10 NAHA WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Naha	Comparative HCC Statistic
Total Land Area	0.1 km^2	23.5 km^2
Population (2009)	348	62960
Population Density	4535.6 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	-6.0% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	0.0%	28.4%
Share of land informally settled	0.0%	14.4%
Average population density of ISZs	N/A	5275 persons / km^2
Rates of home ownership	9.3%	38.2%
Housing with Traditional or Makeshift Roofing	13.0%	18.3%
Demographics		
Population classified as youth (0-25)	57.9%	56.3%
Population classified as children (0-15)	36.5%	32.1%
Access to Utilities/Services		
Households with metered water	98.1%	75.4%
Households with sealed sanitation	68.5%	82.7%
Households with electricity	81.5%	64.4%
Households with one or more mobile phone	74.1%	76.9%
Households with internet access	0.0%	4.1%
Livelihoods		
Households dependent on wage-based income	79.7%	77.8%
Households growing their own food	5.6%	40.5%
Households fishing on a regular basis	5.6%	8.2%

Figure 68: Naha Ward – Key Statistics and City Comparison

Naha is the smallest of Honiara's 12 wards by area, measuring only 0.1km^2. Its population of 348 residents in 2009 is also a reduction from the 1999 census of around 6% per year, as shown in Figure 68. There are no recorded informal settlements in Naha, however home ownership rates are very low (9.3%) relative to elsewhere in the city.

Access to utilities is varied, with electrification above average but sealed sanitation only being available to two-thirds of residents. Rates of household backyard food production are also much lower than the overall city average.

A number of malls and businesses occupy the coastal zone of the ward north of the Kukum Highway, with shopfronts occupying the southern side of the highway in the ward's east. Although the coastline is heavily modified due to sea walls, these areas are likely to be at risk in the event of a severe storm surge or tsunami.

Naha Ward-specific Actions

Naha ward was unable to complete the ward-level exercise at the Honiara Urban Resilience and Climate Adaptation Forum in August 2015. As such, the actions listed here relate to specific critical infrastructure and expert input, as well as more general observations relating to key hazards and informal settlement upgrading.

The first action recommended for this ward area is to complete the ward level activity, in partnership with the Ward Development Committee, HCC and UN-Habitat.

W10.1 Street tree planting programme and drainage/permeability upgrade.

- Expanded use of street trees has the potential to create shade, reduce air pollutants and maximise stormwater uptake through permeable surfaces, thereby reducing stormwater runoff.

W10.2 Conduct detailed survey analysis of coastal inundation potential.

- The lack of a sea wall at this site creates the potential for deeper inundation in the event of a storm surge

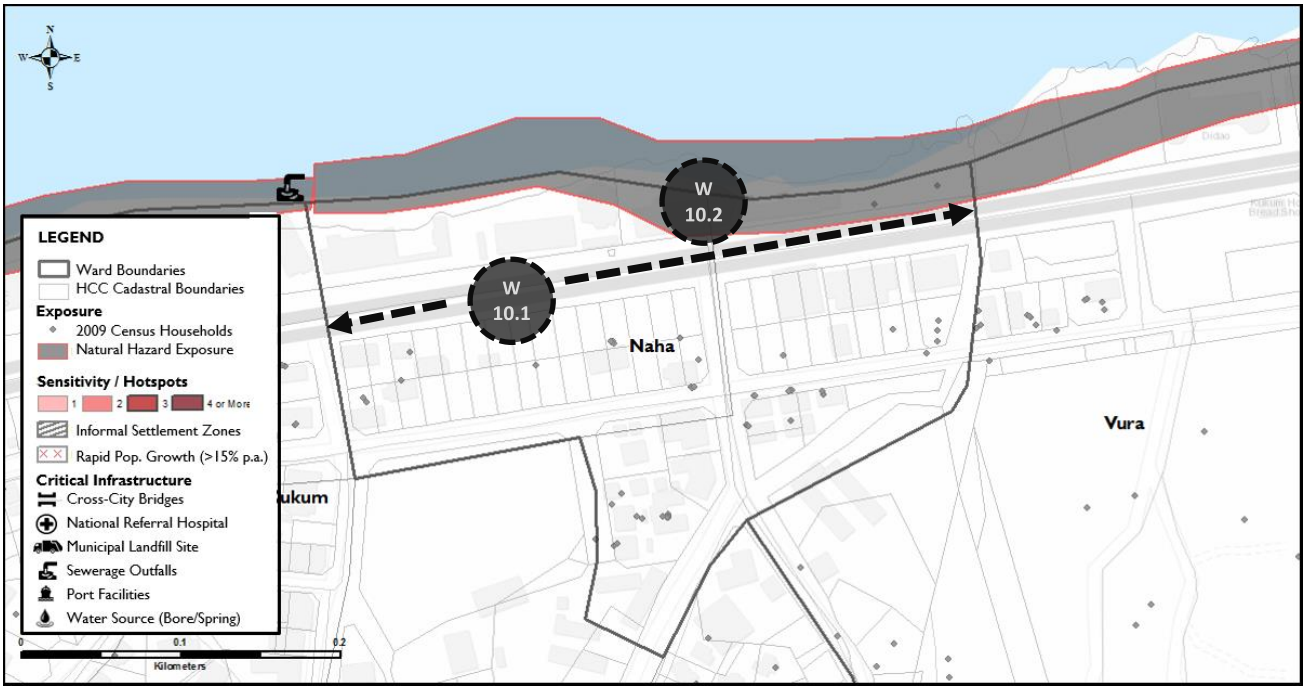

Figure 69: Naha Ward-specific Actions and Vulnerability Profile

4.2.11 VURA WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Vura	Comparative HCC Statistic
Total Land Area	2.2 km^2	23.5 km^2
Population (2009)	9240	62960
Population Density	4084.5 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	1.5% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	20.1%	28.4%
Share of land informally settled	12.3%	14.4%
Average population density of ISZs	6673.8 persons / km^2	5275 persons / km^2
Rates of home ownership	34.1%	38.2%
Housing with Traditional or Makeshift Roofing	9.7%	18.3%
Demographics		
Population classified as youth (0-25)	56.4%	56.3%
Population classified as children (0-15)	31.5%	32.1%
Access to Utilities/Services		
Households with metered water	77.7%	75.4%
Households with sealed sanitation	88.6%	82.7%
Households with electricity	77.0%	64.4%
Households with one or more mobile phone	83.2%	76.9%
Households with internet access	2.3%	4.1%
Livelihoods		
Households dependent on wage-based income	80.3%	77.8%
Households growing their own food	32.2%	40.5%
Households fishing on a regular basis	7.2%	8.2%

Figure 70: Vura Ward – Key Statistics and City Comparison

Covering almost 10% of Honiara, Vura ward contains around 15% of the city's population with around one-fifth living in informal settlements (as shown in Figure 70 above). These ISZs border some of the city's most quickly growing Enumeration Areas (EAs growing by 15% per annum between 1999 and 2009 are shown below in Figure 70). Problematically, these areas are both expanding into customary land in Guadalcanal province, and also encroaching on two of the city's critical bore holes, which supply a large area with drinking water.

The ward's eastern border is made up of a critical north-south road that provides access to the city for many of the ward's residents, as well as those from neighbouring Panatina. One of the city's sewer outfalls is located at the ward's narrow coastal strip.

Vura Ward-specific Actions

Proposed adaptation and resilience-building actions for Vura Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor,

community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

Additional input has been provided based on critical infrastructure analysis and hazard exposure data, with further actions developed by expert stakeholders and the UN-Habitat team. A collation of these actions is provided below:

W11.1 Develop a land release strategy for the ward with a fixed timeline for implementation.

- Targeted at rapid growth areas, Vura has the potential to model community-funded affordable housing schemes, which could potentially follow similar low-cost, climate resilient building approaches and financing models used in Fiji and elsewhere in the Pacific.

W11.2 Use the major north-south arterial road to build a new major drain for the ward.

- This would address a number of issues identified by participants in terms of localised flooding without majorly disrupting or relocating large areas of housing. Other services could also be 'piggy-backed' onto the works programme.

W11.3 Re-establish ToL to FTE conversion programme in new settlement areas.

- To be conducted in partnership with MLHS and UN-Habitat's PSUP process.

W11.4 Sewer outfall upgrades and pipe maintenance.

- As noted in other ward profiles, the degradation of outfalls and piping is leading to septic intrusion across the city.

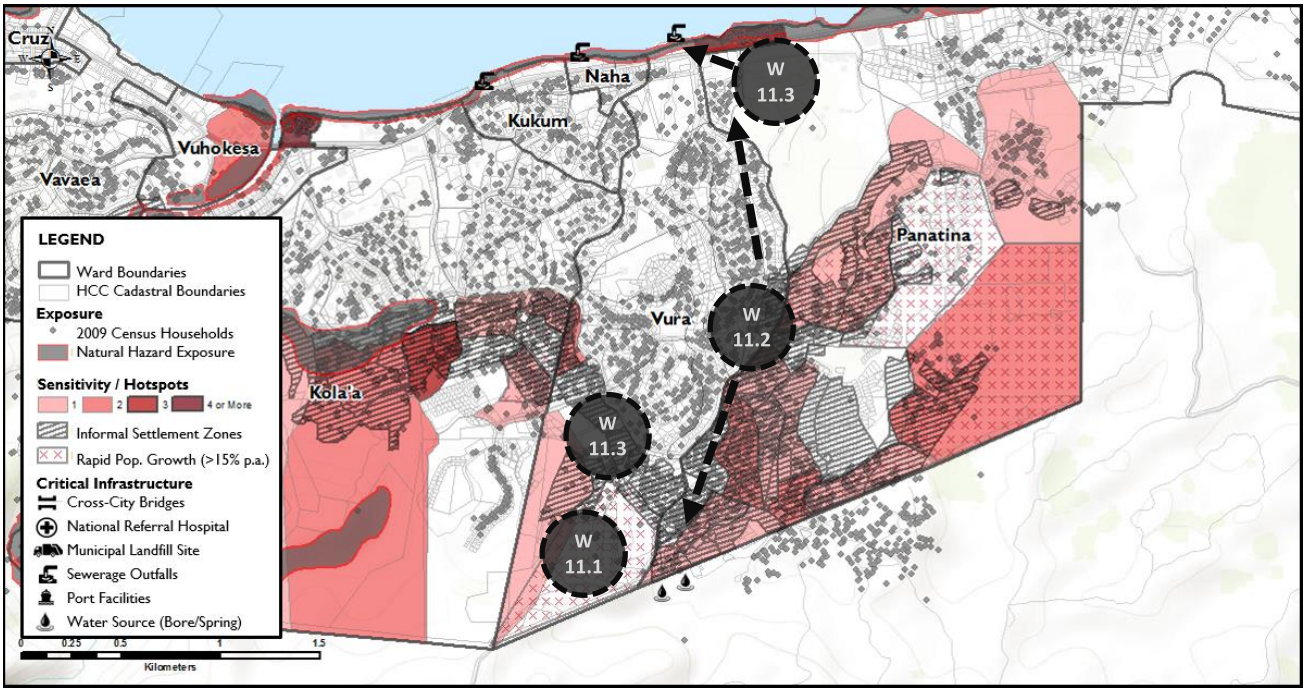

Figure 71: Vura Ward-specific Actions and Vulnerability Profile

4.2.12 PANATINA WARD: PROFILE AND ADAPTATION ACTIONS

Ward Profile	Panatina	Comparative HCC Statistic
Total Land Area	7.0 km^2	23.5 km^2
Population (2009)	13269	62960
Population Density	1970.2 persons / km^2	2677 persons / km^2
Annual Average Pop. Change 1999-2009	4.7% per year	2.7% per year
Informality, Housing & Tenure		
Share of population living in ISZs	48.6%	28.4%
Share of land informally settled	17.9%	14.4%
Average population density of ISZs	5341.3 persons / km^2	5275 persons / km^2
Rates of home ownership	37.7%	38.2%
Housing with Traditional or Makeshift Roofing	20.3%	18.3%
Demographics		
Population classified as youth (0-25)	57.7%	56.3%
Population classified as children (0-15)	33.3%	32.1%
Access to Utilities/Services		
Households with metered water	63.6%	75.4%
Households with sealed sanitation	75.0%	82.7%
Households with electricity	57.2%	64.4%
Households with one or more mobile phone	73.9%	76.9%
Households with internet access	3.0%	4.1%
Livelihoods		
Households dependent on wage-based income	76.8%	77.8%
Households growing their own food	51.1%	40.5%
Households fishing on a regular basis	6.8%	8.2%

Figure 72: Panatina Ward – Key Statistics and City Comparison

Panatina contains 30% of Honiara's land area, and over a fifth of the city's population, as shown in Figure 72 above. Almost half of these inhabitants live informally, in particular in ISZs along the ward's south-western edge (see Figure 73), however the population density of the ward remains low due to areas of land that can be developed in the ward's south-east. Large cross-border settlements are encroaching into Guadalcanal, as well as the two bore holes discussed in reference to Vura Ward. The high share of ISZs is reflected in lower than average utilities access and a higher dependency on backyard food production.

In addition to these large residential zones, the north-east of Panatina consists of a mixed industrial zone, docking facilities, a large shopping district and the city's golf course. Extensive additional sports and recreational facilities are co-located on the southern side of the Kukum Highway, along with the Solomon Islands National University and the King George VI National High School.

The city's only landfill site is located at the north-eastern edge of Panatina, with this site and much of the coastal light industry exposed to potential risk from coastal inundation in the event of a tropical cyclone.

Panatina Ward-specific Actions

Proposed adaptation and resilience-building actions for Panatina Ward were developed as part of the Honiara Urban Resilience and Climate Adaptation Forum held in Honiara in August 2015. Participants included the ward councillor, community representatives and stakeholders from a range of civil society organisations, government departments and donor groups.

Additional input has been provided based on critical infrastructure analysis and hazard exposure data, with further actions developed by expert stakeholders and the UN-Habitat team. Panatina ward also includes the Fishing Village Hotspot, which is addressed separately in Section 4.3.

W12.1 Community consultation and profiling of cross-border growth into Guadalcanal Province.

- As discussed in earlier ward profiles, the tensions relating to customary land rights require a high level of sensitivity and need to be managed to ensure that the capacity of the city to manage climate impacts is not compromised.

W12.2 Develop a protection plan for the local water source from encroaching urban growth, including an engagement plan with local informal communities.

- Potential to follow models such as the Tagabe Watch Catchment Management Committee in Port Vila. Explore opportunities to move the sourcing of water further upstream.

W12.3 Integrate sewer outfall upgrading with an industrial coastal pollution monitoring and awareness programme.

- Intended to provide a basis for overall improvement in coastal management practices.

W12.4 Rehabilitate leaching waste from the landfill site and identify a less hazard-prone medium term alternative, along with appropriate management processes and other associated facilities (including sewerage).

- The city as a whole has a need for long-term waste management (and recycling) options, as well as green waste reduction.

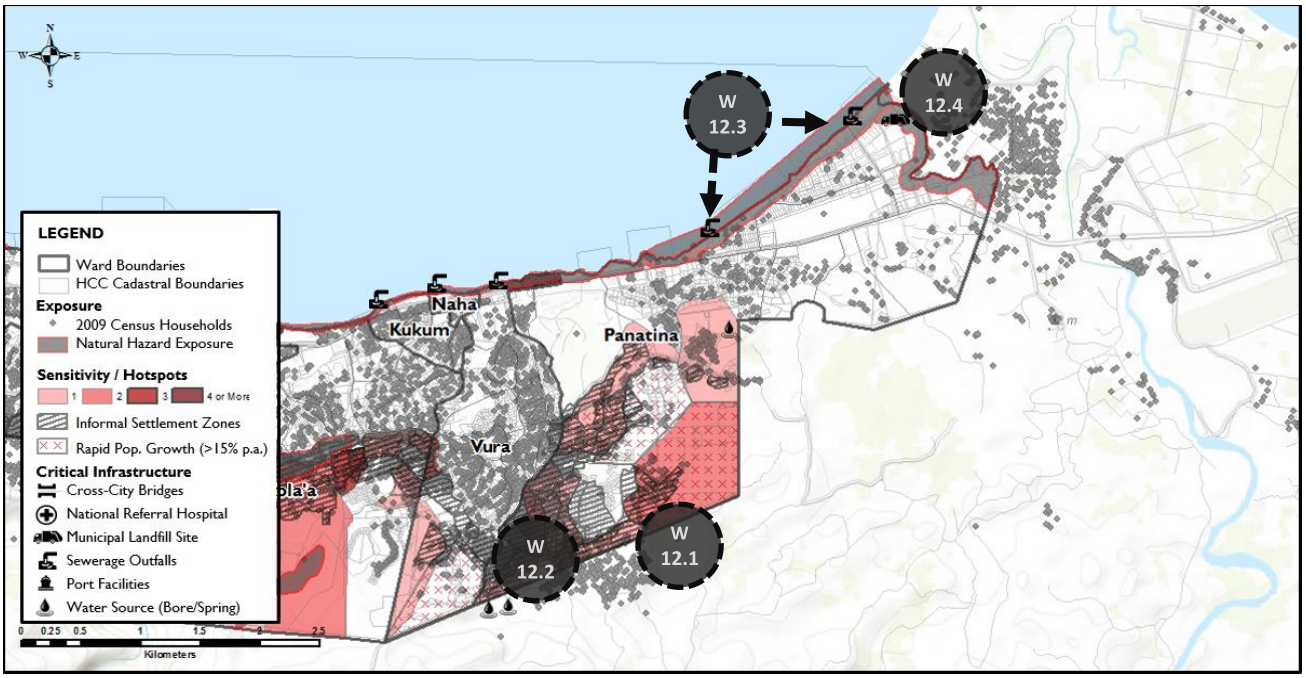

Figure 73: Panatina Ward-specific Actions and Vulnerability Profile

4.3 HOTSPOT COMMUNITY ACTIONS

Three community workshops were held in areas that are considered the most vulnerable in Honiara (though many of the findings from this activity may also be relevant to other areas of the city). Workshop activities were structured to enable group discussions that first led to the identification and agreement of the main issues and objectives, and then the prioritisation of associated actions that would contribute to increased resilience in their communities. The objectives are categorised under the thematic areas for consistency, followed by a prioritised list of local actions (indicated in cases when priority had been assigned). It is important to note that these actions may cut across thematic categories e.g. actions for overcrowding could either involve alternative land for relocation (urban planning and land development) or proper planning and design of houses (housing).

ONTONG JAVA HOTSPOT COMMUNITY-LEVEL ACTIONS:

The Ontong Java community is located on the coast at the mouth of the Mataniko River. The majority of issues that were raised relate to either being on the coast, flooding and need for improved drainage, or alternatively to general development deficits which are worsened by their location. As a consequence, availability of alternative land for resettlement was considered a primary action across multiple issues / objectives.

Ontong Java Settlement – Community Proposed Actions by Local Objective Area	Linked City-wide Objective Areas	Key Area Addressed:			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
i) Improved flood risk management and drainage								
OJH1.1 Build proper drainage	1, 2, 4	✓	✓	✓	M.T.	Med	$$$$	SIWA
OJH1.2 Reinforce the seawall	1, 3, 5	✓	✓	✓	S.T.	Med	$$$$	MID
OJH1.3 Re-route main drain	1, 3, 4	✓	✓	✓	M.T.	Med	$$$$	SIWA
OJH1.4 Local rubbish mgmt. scheme	1, 4, 8	✓	✓	✓	S.T.	High	$$$$	CDC
ii) Reduce water logging								
OJH2.1 Improve drainage	3, 4, 9	✓	✓	✓	S.T.	Med	$$$$	SIWA
OJH2.2 Water tanks for all houses	2, 3, 4	✓	✓	✓	M.T.	Med	$$$$	MID
OJH2.3 Improved sanitation	3, 4, 5	✓	✓	✓	M.T.	Low	$$$$	SIWA
OJH2.4 Infilling of settlement area	1, 2, 3	✓	✓	✓	L.T.	Low	$$$$	HCC
iii) Provide access to additional land/provision in an inland location to compensate for overcrowding								
OJH3.1 Alternative land for relocation	1, 2, 10	✓	✓	✓	M.T.	High	$$$$	MLHS
OJH3.2 Funding mechanism/source for land	1, 2, 10	✓	✓	✓	M.T.	High	$$$$	OPMC
OJH3.3 Community engagement to discourage in-migration from Ontong Java	1, 8, 10	✓	✓	✓	S.T.	Med	$$$$	CDC
OJH3.4 Family planning education campaign	7, 6, 10	✓	✓	✓	S.T.	Med	$$$$	MYWS
OJH3.5 Proper planning/design of housing	1, 2	✓	✓	✓	M.T.	Low	$$$$	MLHS
OJH3.6 Enable cross-cultural inter-marriage to enable access to alternative land	2, 7, 8	✓	✓	✓	L.T.	Low	$$$$	GPG

iv) Manage coastal erosion and protection measures at waterfront and river bank								
OJH4.1 Hybrid coastal defence approaches (e.g wave-breakers, mangrove plantings, infill)	3, 4, 5	✓	✓	✓	L.T.	High	$$$$	MID
v) Increase preparedness for coral bleaching								
OJH5.1 Education & awareness raising	7, 9, 10	✓	✓	✓	S.T.	Med	$$$$	MECCDM
vi) Reduce external and internal water pollution (coastal and riverine)								
OJH6.1 Prohibit riverine dumping of waste	4, 7, 8	✓	✓	✓	M.T.	High	$$$$	HCC
OJH6.2 Mataniko river clean-up project	4, 5, 8	✓	✓	✓	S.T	High	$$$$	HCC
OJH6.3 HCC sewage treatment plant	1, 3, 4	✓	✓	✓	L.T.	High	$$$$	HCC
OJH6.4 Proper hospital waste treatment	3, 4, 10	✓	✓	✓	S.T.	High	$$$$	MHMS
vii) Facilitate better rubbish disposal								
OJH7.1 HCC rubbish collection scheme	1, 4, 10	✓	✓	✓	M.T.	Med	$$$$	HCC
OJH7.2 Education & awareness raising	7, 8, 10	✓	✓	✓	S.T	Med	$$$$	CDC
viii) Manage exposure to extreme heat								
OJH8.1 Plant more trees	5, 7, 10	✓	✓	✓	S.T.	High	$$$$	CDC
OJH8.2 Allow for airflow	1, 2, 6	✓	✓	✓	M.T.	Med	$$$$	MLHS
OJH8.3 Raise houses	2, 8, 9	✓	✓	✓	L.T.	Low	$$$$	CDC
OJH8.4 Build cool rest houses	2, 9, 10	✓	✓	✓	S.T.	Low	$$$$	MLHS
OJH8.5 Monitor elderly and young people	6, 7, 10	✓	✓	✓	S.T.	High	$$$$	CDC
ix) Reduce environmentally-driven health issues								
OJH9.1 Conduct a local health expo (including the likely impact of climate change on vector-borne disease)	7, 8, 10	✓	✓	✓	S.T	High	$$$$	MHMS
OJH9.2 Health awareness campaign	6, 7, 8	✓	✓	✓	M.T.	Low	$$$$	MHMS
OJH9.3 Promote healthier living/diet	6, 7, 8	✓	✓	✓	M.T	Low	$$$$	MHMS

AEKAFO PLANNING ZONE, KOLA'A HOTSPOT COMMUNITY-LEVEL ACTIONS:

Kola'a is situated in steep, hilly terrain upstream from Ontong Java and as a consequence many of the issues that were identified by local community members were linked to flood and landslide risks, accessibility, infrastructure deficits, as well as limited rubbish disposal and poor sanitation (the overwhelming majority of actions were linked to water, sanitation and waste).

Aekafo Planning Zone, Kola'a – Community Proposed Actions by Local Objective Area	Links to City-wide Objective Areas	Key Area Addressed:			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
i) Prohibit housing in flood risk/landslide prone areas								
APH1.1 Enforce planning scheme compliance through community structures	1, 8, 10	✓	✓	✓	S.T.	High	$$$$	CDC
APH1.2 Effective town planning by HCC	1, 7, 8	✓	✓	✓	S.T.	High	$$$$	HCC
APH1.3 Community education and awareness raising around climate hazards	7, 8	✓	✓	✓	S.T.	High	$$$$	MECCDM
APH1.4 Remove housing in at risk areas	1, 2, 9	✓	✓	✓	M.T.	High	$$$$	MLHS
APH1.5 Develop and advocate local actions based on the HURCAP & VAA	1, 10	✓	✓	✓	S.T.	High	$$$$	CDC
APH1.6 Impose penalty fees for breaches of building location code	1, 2, 8	✓	✓	✓	M.T.	Med	$$$$	HCC
ii) Develop better quality housing								
APH2.1 Identify low-cost housing options	2	✓	✓	✓	M.T	High	$$$$	MLHS
APH2.2 Community-level housing plans	2, 10	✓	✓	✓	M.T.	Med	$$$$	CDC
APH2.3 Identify financial support options	2, 10	✓	✓	✓	S.T.	Med	$$$$	MLHS
APH2.4 Develop community by-laws	2, 8, 10	✓	✓	✓	M.T.	Med	$$$$	CDC
iii) Increase number of households with land titles/registration								
APH3.1 Land use & housing assessment	1, 2	✓	✓	✓	S.T.	High	$$$$	MLHS
APH3.2 Deploy FTE across the community	1, 2, 10	✓	✓	✓	M.T.	High	$$$$	MLHS
APH3.3 Legal enforcement of building code	2, 8	✓	✓	✓	M.T.	High	$$$$	MLHS
APH3.4 Awareness raising of the issues	2, 7	✓	✓	✓	M.T.	Med	$$$$	MLHS
iv) Improve road system								
APH4.1 Infrastructure plan for roads	1, 3	✓	✓	✓	M.T.	High	$$$$	MLHS
APH4.2 Technical support from SIG	3, 10	✓	✓	✓	S.T.	Med	$$$$	MID

v) Improve sanitation & drainage								
APH5.1 Community education and awareness raising	4, 6, 7	✓	✓	✓	M.T.	High	$$$$	SIWA
APH5.2 Enforce compliance through community support	4, 7, 10	✓	✓	✓	M.T.	High	$$$$	CDC
APH5.3 Local sanitation and drainage plan	1, 4, 10	✓	✓	✓	S.T.	Med	$$$$	SIWA
APH5.4 Seek financial support	4, 10	✓	✓	✓	S.T.	Med	$$$$	CDC
APH5.5 Technical support from HCC, SIWA, SIG, UN, donors & civil society	4, 10	✓	✓	✓	S.T.	Med	$$$$	SIG
APH5.6 Build septic tanks	3, 4, 6	✓	✓	✓	L.T.	High	$$$$	MID
APH5.7 Build improved/resilient drop-pit toilets	3, 4, 6	✓	✓	✓	S.T.	High	$$$$	MID
vi) Improve rubbish disposal & waste management								
APH6.1 HCC rubbish collection	4, 10	✓	✓	✓	S.T.	Med	$$$$	HCC
APH6.2 Community awareness program	4, 7, 8	✓	✓	✓	M.T.	Med	$$$$	MECCDM
APH6.3 Proper bins with road access	1, 4, 10	✓	✓	✓	S.T.	High	$$$$	HCC
APH6.4 Waste legislation	1, 8, 10	✓	✓	✓	M.T.	High	$$$$	HCC
APH6.5 Cleaning rules for poultry houses	1, 2, 4	✓	✓	✓	S.T.	Low	$$$$	CDC
APH6.6 Proper fencing for livestock	3, 4, 6	✓	✓	✓	M.T.	Low	$$$$	CDC
APH6.7 Consult authorities on health-focused awareness raising options	4, 6, 7	✓	✓	✓	S.T.	Med	$$$$	CDC
vii) Provide clean drinking water								
APH7.1 Roll-out water tanks	2, 3, 4	✓	✓	✓	M.T.	High	$$$$	MID
APH7.2 Installation of pipes by SIWA	3, 10	✓	✓	✓	M.T.	High	$$$$	SIWA
APH7.3 Advocate for dam construction	1, 3, 10	✓	✓	✓	L.T.	Low	$$$$	CDC
viii) Increase public health								
APH8.1 Education on healthy lifestyles	6, 7	✓	✓	✓	S.T.	High	$$$$	MHMS
APH8.2 Construct satellite health centres	3, 6, 10	✓	✓	✓	M.T	Med	$$$$	MHMS
APH8.3 Public clean-up programme	4, 6, 10	✓	✓	✓	S.T.	Low	$$$$	MECCDM
ix) Provide education on environmental risks								
APH9.1 Community awareness raising	7, 9, 10	✓	✓	✓	S.T.	High	$$$$	MECCDM
APH9.2 Enforce compliance through community support	1, 8, 10	✓	✓	✓	S.T.	Low	$$$$	CDC
x) Encourage a zero violence community								
APH10.1 Stop home-brew production	8, 10	✓	✓	✓	S.T	Med	$$$$	RSIP

APH10.2 Develop police reporting procedures	1, 8, 10	✓	✓	✓	M.T.	Low	$$$$	RSIP
APH10.3 Create a partnership program between community leaders and police	1, 8, 10	✓	✓	✓	S.T.	Low	$$$$	RSIP

KUKUM FISHING VILLAGE HOTSPOT COMMUNITY-LEVEL ACTIONS:

Fishing Village is again most concerned about coastal issues, though, due to its location, there is less focus on riverine issues than is the case with Ontong Java (though relocation was also cited as an option). There is also more noticeable attention paid to disaster risk reduction. Again, as with the other two hotspots, many of the critical issues relate to deficits in development.

Fishing Village Community Proposed Actions by Local Objective Area	Links to City-wide Objective Areas	Key Area Addressed:			Implementation Factors			
		Climate	DRR	Urban	Timing	Priority	Cost	Lead(s)
i) Relocation								
FVH1.1 Develop a relocation strategy	1, 2, 10	✓	✓	✓	L.T.	High	$$$$	MLHS
FVH1.2 Identify funding for new land	1, 2, 10	✓	✓	✓	M.T	High	$$$$	MLHS
FVH1.3 Reduce overcrowding in villages	1, 2, 10	✓	✓	✓	L.T.	High	$$$$	CDC
FVH1.4 Plan a structure for maintaining coastal access for relocated fishermen	1, 5, 10	✓	✓	✓	M.T.	High	$$$$	MLHS
ii) Dealing with over-population								
FVH2.1 MLHS land/population assessments	1, 2, 10	✓	✓	✓	S.T.	High	$$$$	MLHS
FVH2.2 City-wide land release programme	1, 2, 6	✓	✓	✓	M.T.	High	$$$$	Land Brd
FVH2.3 Reclamation of coastal land	1, 2, 5	✓	✓	✓	L.T.	Med	$$$$	MLHS
FVH2.4 Family planning education	6, 7, 8	✓	✓	✓	M.T.	Low	$$$$	MWCY
FVH2.5 Build low-cost, high-density housing	1, 2	✓	✓	✓	M.T.	Low	$$$$	MLHS
FVH2.6 Health clinic in village	3, 6, 10	✓	✓	✓	S.T.	High	$$$$	MHMS
iii) Manage flood risk								
FVH3.1 Installation of proper drainage	1, 3, 4	✓	✓	✓	M.T.	High	$$$$	
FVH3.2 Early warning systems for flood	3, 4, 9	✓	✓	✓	S.T	Med	$$$$	
FVH3.3 Raise buildings	1, 2, 3	✓	✓	✓	L.T.	Med	$$$$	CDC
FVH3.4 Retreat from high-risk flood zones	1, 3, 9	✓	✓	✓	M.T.	Low	$$$$	CDC
iv) Provide safety from cyclones								
FVH4.1 Develop local cyclone research	1, 7, 10	✓	✓	✓	S.T.	High	$$$$	
FVH4.2 Education on safety procedures	5, 7, 8	✓	✓	✓	S.T.	Med	$$$$	
v) Provide proper sanitation								
FVH5.1 Funding for improved sanitation	3, 4, 10	✓	✓	✓	M.T.	High	$$$$	MID
FVH5.2 SIG to support SIWA roll-out	3, 4, 10	✓	✓	✓	S.T.	High	$$$$	OPMC

FVH5.3 Hygiene education program	4, 6, 7	✓	✓	✓	S.T.	Med	$$$$	MHMS
FVH5.4 Awareness raising on health risks	4, 6, 7	✓	✓	✓	M.T.	Med	$$$$	MHMS
FVH5.5 More public toilets	1, 3, 6	✓	✓	✓	M.T.	Low	$$$$	HCC

vi) Provide access to drinking water								
FVH6.1 Installation of public water taps	1, 3, 4	✓	✓	✓	M.T.	High	$$$$	SIWA
FVH6.2 Installation of piping	1, 3, 4	✓	✓	✓	M.T.	High	$$$$	SIWA
FVH6.3 Provision of water tanks	2, 3, 4	✓	✓	✓	M.T.	Med	$$$$	MID
vii) Ensure proper rubbish disposal								
FVH7.1 Proper landfill site	1, 3, 4	✓	✓	✓	M.T	Low	$$$$	HCC
FVH7.2 HCC rubbish collection	1, 4, 10	✓	✓	✓	S.T.	High	$$$$	HCC
FVH7.3 Remove upstream river pollution	4, 5, 6	✓	✓	✓	S.T.	Med	$$$$	MECCDM
viii) Build protection from sea level rise & coastal erosion								
FVH8.1 Build seawall	1, 3, 5	✓	✓	✓	M.T.	High	$$$$	MID
FVH8.2 Sea breakers	1, 3, 5	✓	✓	✓	M.T.	Low	$$$$	MID
ix) Reduce coastal pollution								
FVH9.1 HCC wastewater treatment plant	1, 3, 4	✓	✓	✓	M.T.	High	$$$$	HCC
FVH9.2 Clean up beach pollution	4, 5, 10	✓	✓	✓	S.T.	High	$$$$	CDC
FVH9.3 Divert sewerage line	1, 3, 4	✓	✓	✓	M.T.	High	$$$$	SIWA
x) Reduce risk of fire								
FVH10.1 Buy generator/sea water pump	3, 4, 5	✓	✓	✓	S.T.	High	$$$$	CDC
FVH10.2 HCC fire service infrastructure	1, 3, 9	✓	✓	✓	M.T.	Med	$$$$	HCC
xi) Protect from tsunami								
FVH11.1 NDMO warning system/siren	3, 7, 9	✓	✓	✓	S.T.	High	$$$$	NDMO
FVH11.2 Community awareness program	7, 9, 10	✓	✓	✓	S.T.	Low	$$$$	NDMO
xii) Protect from cyclone								
FVH12.1 Plant mangroves	5, 9	✓	✓	✓	S.T.	Med	$$$$	MECCDM
FVH12.1 Develop cyclone warning system	3, 7, 9	✓	✓	✓	S.T.	Med	$$$$	NDMO
FVH12.3 Link community to NDMO	9, 10	✓	✓	✓	M.T.	Low	$$$$	CDC

5. COMMUNICATION: AWARENESS RAISING AND EDUCATION

Being aware of current day vulnerabilities to shocks and stresses, and possible climate-related risks in the future, are vital first steps in formulating adaptation responses and implementing actions that will enhance community resilience (i.e. what are we adapting to?). The development of this urban resilience and climate adaptation action plan for Honiara was therefore deliberately designed to be stakeholder-led, ensuring that traditional knowledge and local experience not only informed the identification of key vulnerabilities but also contributed to an overarching resilience framework and the compilation of local and city-wide actions (how are we going to adapt, and who will be responsible for leadership?).

It was intended that this bottom-up approach would encourage local ownership of the action plan, as well as contributing to the goals of the National Climate Change Policy on Education, Awareness and Capacity Building (8.7), in particular the need to 'strengthen the capacity and partnerships of national and provincial government agencies, national institutions, NGOs, churches and all Solomon Island communities to undertake vulnerability and adaptation and disaster risk reduction assessments for different sectors and geographic areas'.

Integrating the local knowledge base with the latest science was an important component in the development of the Honiara action plan; this was founded on an understanding that looking solely to the past when planning for the future is no longer an option given the significant new challenges that will be posed by a combination of urbanisation trends and the impacts of global environmental change. Indeed, whilst local knowledge was valuable in informing community discussions about recent weather events and current day development needs, scientific knowledge and data needed to be introduced when considering future risks. This required, for example, the translation of complex – and uncertain climate scenarios into formats that could be easily understood by a wide range of stakeholders. This integration of DRR, immediate development needs, and CCA knowledge was a complicated process, though a necessary one to bring together the consideration of multiple shocks and stresses within a comprehensive urban resilience framework of action for the city.

Good facilitation was critical to support this assessment and planning process, to ensure that relevant information was introduced and understood, and to provide a transparent platform for dialogue and knowledge sharing that was open to a multitude of different voices. This recognises that planning for resilience is as much about creating spaces for learning and the sharing of experiences as it is about the actual implementation of physical measures.

One important finding from the engagement process was the need to clearly differentiate between impacts which were climate-driven (and hence could amplify over time due to the effects of climate change), those which were climate-influenced, and those which were predominantly human-driven. Three different examples, drawn from the community engagement process, highlight the importance of communicating the underlying drivers of impacts in order to raise community awareness and to plan the interventions that will be most effective in the local context.

The first of these relates to the 2014 flood event that impacted the Mataniko River area most severely. Although there was a significant rainfall event the severity of impacts were not a result of climate change per se, rather it can be reasonably argued that a combination of human influences were the root cause of the disaster; including deforestation in the upper reaches of the catchment allowing rapid run-off, large amounts of plastic waste blocking the drainage channels, and the presence of informal settlers in the lower flood risk areas. Targeting action towards these human factors will contribute to the reduction of risk to future heavy rain events.

The second example, showcasing climate influence, is that of excess heat at night. Whilst heat is a climate-related hazard that is being influenced by climate change, this 'urban' problem is also being exaggerated by densification of settlements and the blocking of breezes that have provided natural ventilation in the past. Recreating wind corridors for affected settlements is therefore one possible remedial action.

The final example relates to ocean warming and increasing acidification. This is directly related to a warming world and there is little that can be done to avoid the impacts on coral reefs that will become increasingly evident in the short-to-medium term. Given the likely significant impacts on the marine environment once critical thresholds are passed, resilience building responses will therefore need to consider livelihood diversification options for those most affected. Bearing these three examples in mind, it is important that communication strategies ensure that clear messages about climate change, and other drivers, are produced and disseminated to inform appropriate responses.

Whilst this resilience framework for action has been developed for Honiara using local knowledge; ongoing education, awareness raising activities, and communication of climate (and non-climate) risks that impact on the resilience of the city, continue to be needed. Communication is particularly important when engaging with those groups not normally involved with decision-making processes or with those who are the most vulnerable to shocks in society e.g. informal settlers, women, and youth. In such cases, key messages from this Action Plan – and other scientific sources - will need to be distilled and disseminated using other more accessible formats in order for the findings to resonate more strongly with local communities. It is not only a case of translating evidence from a scientific document to put messages across in simpler English, resources will also need to be made available in the local Pidgin dialect to ensure that dissemination of knowledge is widespread and accessible by all sections of Honiara's communities.

Given local literacy rates there is also value in investigating modes of non-written communication to disseminate information e.g. the use of radio shows to empower vulnerable groups, to embed climate risks and resilience into theatre plays that travel between communities, and to educate school children about key resilience challenges (e.g. integration of climate change into school curricula), are all innovative communication methods and tools that have been used successfully in the Solomon Islands and the broader Pacific region in other contexts. In this regard, youth groups offer great potential for training and introducing creative new ways of raising awareness across society in Honiara.

Ultimately, effective communication is vital to raising the awareness of risks with individuals and communities, and subsequently informing actions that strengthen city and community resilience. As noted, this can be in the context of translating scientific information into formats suitable for local resilience planning, however improvements in communication across departments of Government and between different levels of Government will also be of benefit to the urban resilience agenda in Honiara.

Ward Councils - due to their closeness to day to day community life – are likely to have an important knowledge brokerage role to play in communicating climate risks and supporting the implementation of adaptation measures at the local scale. Building the capacity to act in this important awareness raising role will be needed, but local level governance structures that connect most closely with local communities are important actors in progressing towards a more resilient Honiara. As outlined in the National Climate Change Policy, 'climate change will impact all sectors and levels of society and (…) it is everyone's business and shall be addressed in an integrated and holistic manner'.

Efforts at improving the communication of climate risks and support for public awareness raising campaigns need to be a central component of the urban resilience and climate adaptation action plan. Building capacity to respond to shocks and stresses, across all of Honiara society, is vital if actions are to be equitable and sustainable over time.

6. RESOURCING: OPTIONS & OPPORTUNITIES

Whilst knowledge about potential shocks and stresses is needed to inform resilience strengthening actions, in many (though not all) instances the ability to act – particularly in relation to infrastructure interventions (e.g. the transport network) - will be dependent on being able to access the necessary financial resources. Given its status as a Small Island Developing State, accessing international funds will be one of the primary avenues for accessing finance for resilience measures in Honiara and the Solomon Islands. Many national and international donor agencies and financing organisations have a strong presence in the region, and offer opportunities for grants and loans for projects that promote social, economic, and environmental well-being. These include national donors with an interest in the region, such as USAID, Australian DFAT, NZAID and JICA, as well as regional and international funding bodies such as the Asian Development Bank and the World Bank. It is therefore important that the SI Government continues to strengthen its coordination with these donor and funding partners, to ensure that international bi-lateral funds can be mobilised in support of the urban resilience agenda.

International multi-lateral funds for climate change programmes are also available through high-level mechanisms. One example is the Adaptation Fund, set up as a result of the Kyoto Protocol and financed through contributions to the Clean Development Mechanism. UN-Habitat is accredited as an implementing agency for this scheme. Indeed, the Solomon Islands was a former recipient of such funds in 2011 for a climate adaptation programme focusing on the agricultural sector, in a multi-lateral relationship with UNDP.

More recently, a new Green Climate Fund (GCF) - under the auspices of the UN Framework Convention on Climate Change - has been introduced to support adaptation and mitigation efforts in developing countries. This became operational in May 2015, shortly before the Conference of the Parties in Paris (COP21).The GCF is intended to 'promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change. National ownership is intended to be central to the GCF approach'.

In November 2015, the GCF approved USD 169 million for the first eight projects, which included two private sector and two mitigation projects, and six public sector projects focusing on adaptation or crosscutting mitigation and adaptation. Fiji was awarded one of these initial projects, with a focus on urban water supply and wastewater management. Once the substantive funding pledges by the developed countries are met, it is expected that the GCF will become the main multilateral financing mechanism for poorer countries to support their climate actions. According to their mandate, 'all developing country Parties to the Convention are eligible to receive resources from the GCF. The GCF gives recipient countries access to funding through accredited national, sub-national and regional implementing entities and intermediaries (including NGOs, government ministries, national development banks, and other domestic or regional organizations that can meet the Fund's standards). Countries can also access funding through accredited international and regional entities (such as multilateral and regional development banks and UN agencies) under international access. Private sector entities can also be accredited as implementing entities'.

The Secretariat for the Pacific Regional Environment Program (SPREP) was awarded the status of regional accredited entity for the GCF in 2015, and will play an important intermediary role for the Solomon Islands and the wider Pacific region in accessing these new funds in the short term.

Adaptation measures needed to reduce vulnerability and enhance community resilience in Honiara, as identified by local communities themselves, have been used to populate this urban resilience and climate action plan. As such, the HURCAP provides a valuable and up-to-date evidence-base in support of applications that aim to access international funds through both bi-lateral and multi-lateral financial mechanisms.

Although international finance will obviously be of enormous benefit to progressing the urban resilience agenda in Honiara, it is also important to recognise that there are many other resilience strengthening opportunities available that can be acted upon, at least to some degree, without outside assistance. Indeed, many of the actions that have been identified – urban planning, informal settlements, water, sanitation and waste – fall under the remit of urban development and have already been earmarked for action as part of the Honiara City Council Five-Year Strategic Plan.

In other instances, mainstreaming of climate change considerations may be needed e.g. ensuring climate resilient development in respect of new infrastructure and housing. Again, such actions are relevant to the National Climate Change Policy and can form the basis of cross-cutting policies.

Finally, there are numerous opportunities that can be considered 'low-lying fruit' and could be the subject of early attention, particularly in relation to adaptation as a 'process'. Low-cost initiatives could include a range of capacity building measures (particularly targeting vulnerable groups, harnessing the potential of youth, etc.), as well as efforts to improve local governance arrangements and partnerships for a more resilient Honiara.

In terms of capacity building, there would also be value in exploring the role of local universities to support capacity building initiatives; including the potential for new teaching, learning and research partnerships with other universities in the region. Taking advantage of such 'bottom-up' opportunities have already been recognised in the National Climate Change Policy which highlights the need to 'promote and implement community based programmes and actions within a cooperative framework to strengthen social capital, skills and resilience as an adaptation strategy'.

The Urban Resilience and Climate Action Plan for Honiara has not only collated a portfolio of actions for the city it also provides a useful overarching framework which can act as a coordinating mechanism for multiple, previously discrete, projects in Honiara. Each individual project can potentially add value to Honiara's goal of increased resilience (at little or no cost to HCC or government departments), and can be mapped and integrated with the HURCAP where possible and relevant.

For instance, given the city's continuing development needs, WASH programmes and projects implemented by NGOs can be referred to in the context of 'water, sanitation and waste' theme. Ongoing work by UN-Habitat as part of the Participatory Slum Upgrade Program (PSUP) seeks to strengthen community, city, and national key stakeholders' capacities in participatory slum upgrading, and can make valuable contributions to the 'urban planning and land development' theme. A new five-year programme 'Pacific Ecosystem-based Adaptation to Climate Change', implemented by SPREP, will also get underway in 2016 with Honiara as a case study, and can contribute to resilience responses under the 'Ecosystem Services' theme.

Furthermore, longer term engagement (as is the case with both the existing UN-Habitat and SPREP projects) can help to build the capacity of local communities to plan and implement vulnerability assessments and locally-specific action plans. Clearly, there are a multitude of opportunities to promote urban resilience actions and messages without the need for substantive new funds. However, effective coordination of these different activities will be crucial to ensure maximum impact on the ground.

Finally, being part of regional and international networks can enable Honiara to benefit from shared experiences in the planning and implementing of resilience measures at low cost, and even in some cases with a level of financial and administrative support. As well as being part of the UN-Habitat Cities and Climate Change Initiative, HCC is also represented on the ICLEI regional network for Oceania, and submitted a joint application with Port Vila (Vanuatu) at the end of 2015 to become one of the Rockefeller 100 Resilient Cities (though was unfortunately unsuccessful). Being involved in international urban networks such as these can foster new opportunities for improved resilience planning, action, and local capacity building.

7. MONITORING & EVALUATION

Resilience needs to be understood as a dynamic characteristic of a city; one that will continue to change as a consequence of urbanization processes and local and global environmental change. Hence, monitoring and evaluation will be needed to measure the progress of HURCAP actions, to look for opportunities to improve processes and implementation, and also to ensure that the action plan keeps pace with rapid change in the urban environment.

It is recommended that monitoring activity accounts not only for the implementation – and effectiveness – of actions, but also the processes involved. This will contribute to transparency of the HURCAP, as well as providing a regular assessment of how well issues of equity are being addressed e.g. gender balance, involvement of local communities in decision-making etc. To this end, it would be useful to develop and maintain an urban resilience database that is able to document activity, store disaggregated data, monitor processes, and evaluate the success of implemented actions.

Ownership of the HURCAP is led by a high-level collaboration between HCC, MLHS and MECCDM, evidenced by a cross-government strategic management team responsible for providing leadership of the urban resilience agenda. However, given that there are many opportunities for resilience strengthening at the local level it is also important that effective communication and feedback mechanisms are established between the HURCAP management team and a range of different local actors, from ward councillors through to civil society groups. As with the National Climate Change Policy, a similar requirement for all Government agencies, NGOs, churches, private sector organizations and communities that are involved with implementing programmes and projects, to register and provide annual reports should be considered as a mechanism for coordinating and monitoring the progress of resilience actions.

Promoting an effective urban resilience strategy for Honiara will require a regular assessment of related activity. It is therefore also recommended that an annual monitoring report on processes and outcomes is produced and disseminated to all partners and interested parties, with opportunities for feedback and suggestions for improvements. As is common practice, an evaluation of the implementation of HURCAP after a five year period will also be needed to gauge effectiveness and efficiency against the objectives and actions that have been set out in this first urban resilience and climate adaptation action plan for the city.

8. REFERENCES

ADB (2014) *Solid Waste Management in the Pacific: Solomon Islands Country Snapshot* http://www.adb.org/sites/default/files/publication/42662/solid-waste-management-solomon-islands.pdf

CLGF (2012) *CLGF in the Pacific* http://www.clgfpacific.org/userfiles/1/files/Solomon%20Islands%20local%20government%20profile%202011-12.pdf

Doherty, T. J. & S. D. Clayton (2011) The psychological impacts of global climate change, *American Psychologist, 66, 265-276*.

JICA (2014) Preparatory survey for Kukum Highway Upgrade project in the Solomon Islands http://open_jicareport.jica.go.jp/pdf/12184222_01.pdf

Lal, P. N., & Thurairajah, V. (2011) *Making informed adaptation choices: A case study of climate proofing road infrastructure in the Solomon Islands*. Retrieved from: https://www.environment.gov.au/system/files/resources/67fb2472-ae17-4b88-adb6-62a0c0859940/files/iucn-infrastructure-solomon-islands-case-study.pdf

Ministry of Environment Climate Change Disaster Management and Meteorology (MECDM) (2012) *Solomon Islands National Climate Change Policy 2012-2017*. Retrieved from http://www.gcca.eu/sites/default/files/catherine.paul/si_climate_change_policy.pdf

Ministry of Lands Housing & Survey (MLHS), & Honiara City Council (HCC) (2015) *Honiara Local Planning Scheme 2015*. Honiara, Solomon Islands. Retrieved from http://www.honiaracitycouncil.com/wp-content/uploads/2014/09/Honiara-Local-Planning-Scheme-2015.pdf

Ministry of Mines, Energy and Rural Electrification (MMERE) (2014) *Solomon Islands National Energy Policy* http://prdrse4all.spc.int/production/system/files/volume1_solomon_islands_national_energy_policy.pdf

OCHA (2014) *Solomon Islands: Flash Floods - Humanitarian Snapshot (as of 25 June 2014)*. Retrieved from: http://reliefweb.int/report/solomon-islands/solomon-islands-flash-floods-humanitarian-snapshot-25-june-2014

PACCSAP (2014) *Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports 2014, Solomon Islands*. http://www.pacificclimatechangescience.org/wp-content/uploads/2014/07/PACCSAP_CountryReports2014_Ch13SolomonIs_WEB_140710.pdf

SIMS, BoM & CSIRO (2013) *Current and future climate of the Solomon Islands* http://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/13_PCCSP_Solomon_Islands_8pp.pdf

SINSO (2011) *2009 Census data by wards*. http://www.statistics.gov.sb/component/advlisting/?view=download&format=raw&fileId=413

SINSO (2015) *Prism* http://www.spc.int/prism/solomons/index.php/sinso-documents?view=download&fileId=114

SPC and SPREP (2015) *Strategy for Climate and Disaster Resilient Development in the Pacific*. SPC, Fiji. Retrieved from: http://www.pacificdisaster.net/dox/SRDP_Executive_summary.pdf

Trundle & McEvoy (2015) *Honiara socio-economic Atlas*, unpublished dataset.

UN-Habitat (2014a) *Climate Change Vulnerability Assessment, Honiara, Solomon Islands*. Nairobi: United Nations Human Settlements Programme.

UN-Habitat (2014b) *Planning for Climate Change: A Strategic, Values-based Approach for Urban Planners - Guidance Document*. (B. Barth, M. A. Cea, L. Fee, K. Koch, L. Nesbitt, & V. Quinlan, Eds.) (1st ed.). Nairobi: United Nations Human Settlements Programme.

World Bank (2015a) *Solomon Islands Rapid Employment Project Implementation Status and Results Report: Sequence 7*.

World Bank (2015b) *Disaster Risk Financing and Insurance - Country Note, Solomon Islands*.

The Honiara Urban Resilience and Climate Action Plan is the culmination of a comprehensive and participatory process involving national and local government, NGOs, informal settlement communities, women's and youth groups, academia and the private sector. The plan sets out a portfolio of actions that can be implemented by the City of Honiara and the Government of Solomon Islands to directly contribute to urban resilience in the national capital.

This document complements the *Honiara Climate Change Vulnerability Assessment*, and addresses the complex situation confronting climate change and urban resilience in Honiara. In addition to actions that build resilience vis-à-vis climate variability and other natural hazards the action plan incorporates current vulnerabilities. Addressing immediate needs is therefore strongly reflected in the *Honiara Urban Resilience and Climate Action Plan.*

UN-Habitat's Cities and Climate Change Initiative promotes enhanced climate change mitigation and adaptation in developing country cities. This document is an output of the Cities and Climate Change Initiative activities in support of the government and people of Honiara, Solomon Islands.

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