

Recommendations of Actions for Resilience and Sustainability

PORT VILA



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for Resilience and Sustainability

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UN HABITAT
FOR A BETTER URBAN FUTURE



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The *Recommendations of Actions for Resilience and Sustainability* proposed in this report, and the work undertaken to define them, are outputs of the “Making Cities Sustainable and Resilient Action: Implementing the Sendai Framework for DRR 2015-2030” (MCSR) at the local level. This MCSR action is a joint initiative of UNISDR and UN-Habitat and receives financial support from the European Commission (EC DEVCO). Its overall objective is to improve the understanding of, and capacity to, address disaster risks and build resilience at the local level, by supporting national and local disaster risk reduction (DRR) and climate change adaptation strategies, while focusing on building local capacities.

Since inception in April 2016, the MCSR action has supported over 25 local governments to confidently address the risk and resilience agenda in their cities, using adapted tools and methodologies while increasing capacities. This report details the findings and projected way forward for the city of Port Vila, based on the resilience analysis and diagnosis channelled through the *City Resilience Profiling Tool* (CRPT). UN-Habitat and the Port Vila Municipal Council have led the implementation of the CRPT in the city and have successfully overcome challenges related to data collection and revision. The project has secured commitment from key actors that play a role in current and future steps.

This report details the findings, analysis, diagnosis, and commitment building, as well as the *Recommendations of Actions for Resilience and Sustainability* for the city of Port Vila.

We thank the Port Vila Municipal Council and EC DEVCO for making this report possible and we encourage all participants to proactively follow the progress of the city towards resilience.

This report has been written with the collaboration of an extensive inter/trans-disciplinary team and, as such, some of the terms have been translated directly from Bislama.

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This report is the third phase of the *City Resilience Profiling Programme* 'Giving back' process and accompanies the City / CRPT databases (phase 1) and the city visuals platform (phase 2). This report should be read in combination with the City Resilience Profiling Tool Guide and with the other deliverables developed in phases 1 and 2.

Executive Summary

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In partnership with the Port Vila Municipal Council, UN-Habitat's *City Resilience Profiling Programme* has developed a series of recommended actions for making Port Vila more resilient. *Recommended Actions for Resilience and Sustainability* are focused in three thematic areas and are the result of a multifaceted collaborative process that began in earnest in early 2019.

City context and overview

The city of Port Vila is located on the island of Efate, the most populated within the Vanuatu archipelago. Since gaining independence in 1980, Port Vila has served as Vanuatu's capital and largest city, administrative and economic centre, and location for its most prominent educational institutions. After gaining greater economic importance as a trade and transportation hub within the Vanuatu archipelago during the 18th and 19th centuries, Port Vila's current incarnation has largely been shaped by the country's establishment as an international tax haven in the 1970s and expansion and modernization of the port and wharf in Vila Harbour over the past four decades, leading, in part, to a building boom, expansion of the tourism industry, and rapid growth in population.

Port Vila faces extensive environmental threats, evident in its recent ranking as the "world's most exposed city to natural disasters". Located within the South Pacific Convergence Zone, cyclone belt, and approximately 50 km east of the New Hebrides Trench, Port Vila is subject to a wide array of natural hazards including earthquakes, wave action (including storm surge and tsunami), cyclones, extreme rainfall and flooding. Port Vila is also exposed to complex, systemic threats including the potential for food and/or fuel crisis triggered by domestic and/or international disruptions. Additionally, vulnerability to parasitic epidemics remains high in and around Vanuatu's capital, particularly following a disruptive event the population to water or vector-borne disease. Such threats, many of which are linked to the impacts of rapid urbanisation and climate change, are exacerbated by the existence of impoverished people, limited economic opportunity, lack of institutional capacity and tenuous connectivity to external markets.

Summary of urban performance

The basis for identifying key issues or *stresses* present in the Port Vila urban system was developed through extensive sectoral data collection and analysis. Through the analysis of the eight *Urban Elements: Built Environment, Supply Chain & Logistics, Basic Infrastructure, Mobility, Municipal Public Services, Social Inclusion and Protection, Economy, and Ecology*, a diversity of urban challenges were revealed.

As illustrated in the graphs below, the data completion level for the Port Vila *Urban Element* assessment was robust at 78%. Many of the data gaps were focused in a few specific *components* covering topics that required sophisticated data collection methods (e.g. *Ecology Element's Ecological Footprint Component*). Regarding performance, for benchmarkable (i.e. quantitatively evaluable) *supporting indicators* and *related questions*, collected data suggests that Port Vila features a similar number of vulnerabilities (those with benchmarks indicating 'red' or 'orange') as capacities (those with benchmarks indicating 'green' or 'yellow').

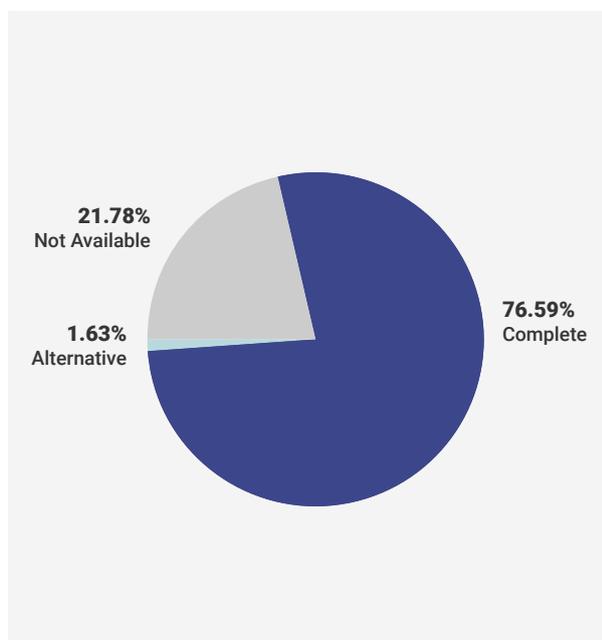


Figure 1: Urban Performance Data Completion.

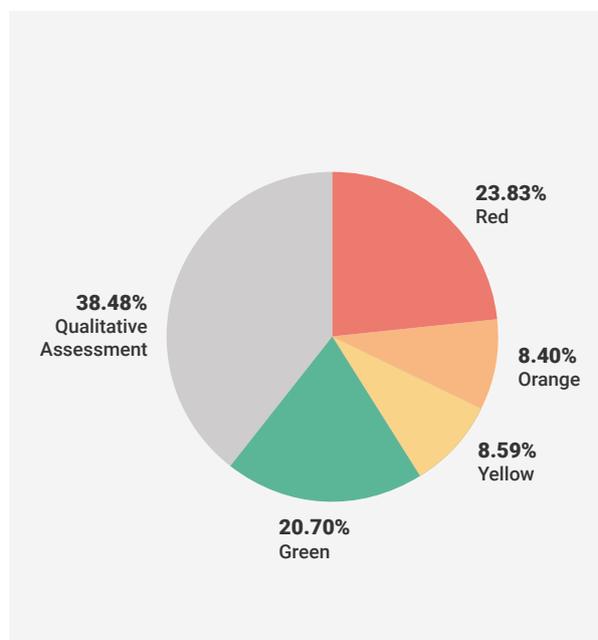


Figure 2: Urban Performance Data Assessment Summary.

A brief summary of some of the key findings derived from the analysis of *Urban Elements* is shown below (a more in-depth review of findings for each *Urban Element* presented in **Annex III. Urban Performance Overview**):

- Urban expansion, both unplanned and planned, is continuously pushing into hazardous and environmentally-sensitive areas, increasing vulnerabilities and decreasing restorative and defensive services provided by the ecosystem.
- The high reliance of urban populations on purchased food, particularly imported foods, increases the vulnerability to food insecurity, particularly in times of natural disaster and rising international food prices.
- Due largely to transportation and transmission costs, Port Vila residents pay among the highest retail prices for electricity and petroleum products in the world.
- In urban areas the proximity of unhygienic sanitation facilities to formal and informal water sources is a significant concern.
- Mobility behaviour and patterns in Port Vila are shaped by multiple factors including the city's overall spatial organisation, the low capacity of the existing transportation modes in meeting demand, and the limited socio-economic capability of people to access transport services.
- Improved coverage of property tax collection and associated property rating systems could support investments in the quality and expansion of public services.
- Local and international non-government organisations (NGOs), such as Wan Smol Bag Theatre Company, play an important role in community resilience actions in the city related to ecological vulnerabilities.

Identification of Shocks, Stresses, and Constraints

The implementation of the CRPT in Port Vila incorporates contextual information into a holistic analysis of the persistent underlying pressures, or *stresses*, impacting the urban system. *Stresses* were initially identified by the CRPP team and based on the accumulation and analysis of data corresponding to the different dimensions of the city of Port Vila – spatial, social, economic, political, environmental, etc. Identified *stresses* were then presented to a group of key stakeholders in a workshop held in Port Vila in April 2019. Using the issues reflected in these data-derived *stresses* as a basis, a series of participatory exercises revealed both additional thematic areas of concern in the city, as well as bolstered those thematic areas previously identified through quantitative analysis with a more detailed assessment of existing and planned political initiatives.

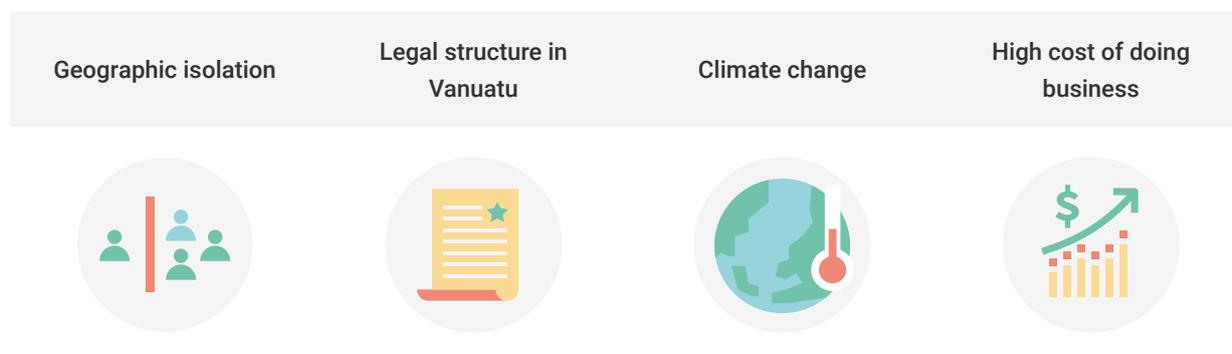
This refinement additionally incorporated discussion of the capacities and competencies of key stakeholders including the PVMC, the pervasiveness of, and vulnerability to, *shocks* Port Vila is subjective to, the extent to which identified *constraints* may hinder or otherwise dictate the feasibility of implementing particular actions, as well as other trends or contextual factors that may not have been adequately captured through quantitative data analysis.

Evaluation of priority shocks and key constraints

Given the numerous *shocks* Port Vila is exposed to, both natural and otherwise, a prioritisation process was conducted in order to focus analytical efforts and provide more in-depth information regarding how certain *shocks* interact with identified *stresses*, the roles of key stakeholders, and evaluated policies, plans and initiatives. Prioritisation was based on the following four criteria: 1) the magnitude of the impact that each *shock* has on the population, assets, and processes of the city; 2) the recurrence of events and their impacts in the different areas of the city; 3) analysis of how different *shocks* act on the diverse *elements* and *components* of the urban system; and 4) projections of climate change trends in Port Vila and how these trends may worsen the impacts of the identified *shocks*. Based on these criteria the following five *shocks* were prioritised:

Natural				Complex
Floods	Droughts	Cyclones	Earthquakes	Food and fuel supply crises
				

In addition, a series of key *constraints* were identified to both better contextualise the various data incorporated into the broader Port Vila analysis as well as inform the design of *Recommended Actions for Resilience and Sustainability*. *Constraints* are to be understood as forces that directly influence decision-making in Port Vila, but which are largely, if not entirely, outside the purview of the local government. Therefore, like *shocks*, *constraints* should be recognised, and their characteristics integrated into the development of policies, plans and initiatives. Four *constraints* have been highlighted as a part of this analysis:



Local government and stakeholder analysis

The analysis of local government and key stakeholders has resulted in a holistic understanding of the key actors operating in Port Vila as well as of the capacities of the local government. While more in-depth information on these subjects can be found in **Annex VI. Local Government and Stakeholder Analysis**, a brief summary of two mutually reinforcing forces that shape the relationships between the local government and other key stakeholders, and have more broadly informed the development and design of *Recommended Actions for Resilience and Sustainability*, are presented below:

Prominence of external actors

Given the extent to which foreign governments and international non-governmental organisations operate in Vanuatu and impact the dynamics of Port Vila, the way in which these entities continue to interact with the city will significantly impact urban trends. For instance, to what extent physical infrastructure and other capital improvement projects -- funded by entities outside of the private sector and/or local, regional or national government -- will be pursued going forward, and what priorities such projects address, will directly relate to where local resources and capacities can be directed to ensure the greatest positive impact. Furthermore, the degree to which these investments are coordinated within a cohesive long-term plan for Port Vila will inform the benefits generated to the city in areas of access to services, economic development, governmental capacity, among others.

Limited competencies of local government

The local government is responsible for the control, management and administration of the municipality. Specific competencies include developing, controlling and managing land taken on lease from any statutory land authority including any housing estates thereon, managing refuse collection and disposal, overseeing cemeteries, maintenance of local roads, parks and open spaces, and the promotion of tourism.

Key activities undertaken by the Port Vila Municipal Council are:

- Control, manage and administer the municipality
- Develop, control and manage land taken on lease from any statutory land authority
- Maintenance of public areas (parks and public halls)
- Keeping Port Vila clean and tidy
- Managing and collecting property taxes

While these competencies provide ample areas to evaluate and improve upon, it should be noted that municipal responsibilities common in many cities around the world do not fall under the purview of the local government such as police, fire or emergency services, education (although there is some involvement in primary education management), or health services.

Analyses of policies, plans and initiatives

As a part of an effort to evaluate the policy context within which the city functions, dozens of existing documents were collected and analysed. While more detailed linkages to the three *Lines of Action* as well as the individual *Recommended Actions for Resilience and Sustainability* are discussed in the subsequent chapters, a short summation of the of the documentation suggests:

- The vast majority of documentation reviewed - laws, plans, programs, initiatives, and projects – were developed by the national government, other foreign governments/development agencies (e.g. DFAT) or non-governmental organisations.
- The documents specifically focused on the local scale are primarily concerned with the following *Urban Elements*: *Built Environment, Supply Chain & Logistics, and Economy*.
- A large proportion of the key documents were produced following the 2009 national census and in the aftermath of Tropical Storm Pam in 2015.
- While the amount of documentation already prepared represents an opportunity for the city of Port Vila to make more informed policy and programmatic decisions, much of the documentation focuses either regionally, nationally, or relies upon older data which may not be reflective of current realities.

Priority stresses

Based on the combination of information regarding Port Vila's *Urban Performance*, prioritised *shocks* and identified *constraints*, an analysis of local government competencies and capacities, the dynamics and interrelationships of key stakeholders operating in the city, relevant policies, plans, and initiatives dictating the policy framework within which the local government operates, other key contextual information about the city data, as well as direct input from a selection of stakeholders involved in a participatory workshop held in Port Vila in April 2019, a series of priority stresses were identified. These priority stresses incorporate a range of both quantitative and qualitative factors, including the integration of analyses regarding the prioritisation of *shocks* and the identification of key *constraints*, ensuring each stress contains concrete evidential justification and integrates contextual factors as well as stakeholder support and understanding.

The resultant group of stresses are as follows:	Lack of economic opportunities (under/unemployment, inadequate skills and capacities, workforce development).
	Lack of investment in / inadequate management of solid waste and sanitation.
	Expansion of informal settlements (lack of tenure, legal rights, access to services).
	Conflict of jurisdictions.
	Lack of gender representation in decision making and implementation.
	Limited enforcement of rules and regulations.
	Lack of schemes for affordable housing.
	No comprehensive planning.

Formulation of the Lines of Action and Recommended Actions for Resilience and Sustainability

An additional exercise conducted in the April 2019 workshop included finding thematic overlaps between identified priority *stresses* in order to focus efforts in developing *Recommended Actions for Resilience and Sustainability*. This more focused approach is enabled by the creation of frameworks or lenses, called *Lines of Action*, through which key actions that seek to address different combinations of prioritised *stresses*, key identified *shocks* and pervasive *constraints* present in the Port Vila urban system can be more effectively designed. In other words, the selected *Lines of Action* seek not only to provide a lens through which to address as many of the prioritised *stresses* as possible, *Lines* have been selected based on the contextual realities of reoccurring natural and complex *shocks* or the existence of key *constraints*. How may economic opportunities in Port Vila be impacted by its exposure to tropical cyclones or pervasive flooding? To what extent are jurisdictional conflicts exacerbated by the current legal structures in place? The three *Lines of Action* derived from the refined group of key *stresses* are:

- Land and Property Data Collection and Management
- Solid Waste and Sanitation Management
- Youth Employment and Economic Development

Within each *Line of Action* three *Recommended Actions for Resilience and Sustainability*, ranging in scope, timeline, required funding, and expected impacts, were developed. Therefore in total, nine recommended actions were designed as a result of the CRPT implementation process. Each action was designed so that it can either be pursued individually or in combination with other *Actions*. To help further inform decision-makers and key stakeholders, for each *Action*, a cost-benefit analysis was conducted using a combination of estimated costs attributed to the full implementation of each *Action* as well as a qualitative evaluation of potential benefits that may be generated by a given *Action* across four categories (economic, fiscal, operational, capacity development). A more detailed description of the cost-benefit evaluation can be found in **Appendix 1. Cost Benefit Analysis of Recommended Actions for Resilience and Sustainability**.

While a more detailed description can be found in **Chapter 2**, a brief summary of the three *Lines of Action* and the contours of the nine *Recommended Actions for Resilience and Sustainability* are presented below:

Land and property data collection and management

This *Line of Action* focuses on the development and facilitation of comprehensive land and property data collection and management. Such data can serve as a basis for a range of policy priorities including, but not limited to, improved provision of municipal services, integrated planning efforts, strengthening property tax revenue and enforcement, creating a less cumbersome development revenue process, and attracting investment in property from existing residents and outside capital sources. Moreover, accurate and up-to-date land and property data has the potential to support PVMC as it branches out beyond data collection and into more complex development issues related to property rights, economic growth and housing affordability in the future.

Solid waste and sanitation management

The solid waste and sanitation management *Line of Action* centres around three themes. The first is the collection of data around waste dumping patterns at the ward level with the view to develop strategies for waste separation and management, including potential business opportunities for the recycling of glass, plastic, and cans as well as compost activities. The second theme focuses on opportunities for better coordination of waste management activities at a city-scale through a Waste Management Steering Committee that would be convened by the PVMC. The third and final theme focuses on public awareness and education, addressing the need to communicate with the public about the critical benefits of waste management through public campaigns and educational training materials for children.

Youth employment and economic development

The actions developed under the youth employment *Line of Action* are intended, firstly, to gather accurate and up-to-date data regarding youth employment in relation to skilled and unskilled youth in Port Vila. The most recent data is taken from the 2009 and therefore over ten years old. Since then, rapid urbanisation has significantly altered the job market, specifically the skills required and the types of jobs available for young people. The second proposed action focuses specifically on “unskilled” youth through the development of a youth commercial agriculture and markets network that aims to upgrade the skills of youth who engage in commercial agriculture activities in Port Vila. Thirdly, a focus on youth workforce preparation is proposed through the development of a Youth Workforce Preparation Hub intended to increase access to information about available youth services such as scholarships, CV writing and career development as well as skill development opportunities such as peer-to-peer training on marketing, proposal writing, and business license registration sessions.



Image 1 : Port Vila, Vanuatu. Source: AusAID.



Glossary

Access	<p>Ability of the rights-holders to use or benefit of a certain service or product.</p> <p>Note: Restrictions can be caused by distance to the source (e.g., water supply network does not reach a certain neighbourhood) and unaffordability (e.g., service is too costly for a certain household or group of people), amongst others.</p>
Alternative sources	<p>Sources that differ from the main city source(s).</p> <p>Note: Particularly applicable for electricity (e.g. generators) and water (e.g. bottled water) supply.</p>
Basic social services	<p>Set of services delivered in education, health, and social areas, as a means to fulfil basic needs.</p>
Biodiversity	<p>Variability among living organisms from all sources including, land, marine and other aquatic ecosystems, and the ecological complexes of which the organisms are part.</p> <p>Note 1: This includes diversity within species, between species, and of ecosystems. Biodiversity is thus not only the sum of all ecosystems, species, and genetic material, but rather represents the variability within and among them.</p> <p>Note 2: Bio-diversity can also be referred to as biological diversity.</p> <p>[Source: Chan, L., et al. User Manual on the Singapore Index on Cities' Biodiversity (also the City Biodiversity Index), 2014]</p>
Built-up areas	<p>Developed area based on built-up pixels.</p> <p>Note 1 : Can be urban, suburban or rural.</p> <p>Note 2: Built-up area is considered urban if the built-up pixels have urban values greater than 50%, suburban if between 10-50%, and rural if less than 10%.</p> <p>[Source: Atlas of Urban Expansion. The City as a Unit of Analysis and the Universe of Cities. 2016].</p>
Captured open land	<p>All open space clusters of less than 200 hectares that are fully surrounded by urban and suburban built-up land pixels and the fringe open space around them.</p>
Constraints	<p>Long-term contextual changes and pressures originated outside the urban system that also undermine the city's capacity for sustainability and resilience.</p>
Civil society	<p>Wide range of individuals, groups of people, networks, movements, associations, and organisations that manifest and advocate for the interests of their members and others.</p> <p>Note 1: They can be based on philanthropic, cultural, religious, environmental, or political values and convictions.</p> <p>Note 2: This definition excludes for-profit companies and businesses, academia, and all government-dependent entities.</p>

Civil Society Organisations (CSOs)	<p>Formal associations in which society voluntarily organises around shared interests.</p> <p>Note 1: They include political, cultural, environmental, and faith-based organisations, as well as non-profit and non-governmental organisations.</p> <p>Note 2: CSOs are institutionalised organisations, bearing some form of legal status, that represent particular groups of society and are involved in service delivery.</p>
Climate change adaptation	<p>Increased ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production.</p> <p>[Source: UNEP]</p>
Climate change mitigation	<p>Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impact of climate change.</p> <p>[Source: UNFCCC]</p>
Connectivity	<p>How a landscape is configured and how it allows species to move through its different elements.</p> <p>Note: A high degree of <i>connectivity</i> is generally linked to low fragmentation.</p>
Contingency planning	<p>Management process that analyses disaster risk and establishes arrangements in advance to enable timely, effective, and appropriate responses.</p> <p>[Source: UNISDR, 2017]</p>
Coverage	<p>Capacity of the duty-bearer to provide a service or product.</p> <p>Note: It may be influenced by its financial capacity, by geospatial setting and the normative and institutional frameworks.</p>
Critical facilities	<p>Physical structures, networks, and other assets which provide services that are essential to the social and economic functioning of a community or society.</p> <p>[Source: UNISDR, 2017]</p>
Decentralised authority	<p>Local authorities, distinct from the state's administrative authorities, who have a degree of self-government, elaborated in the framework of the law, with their own powers, resources, and capacities to meet responsibilities and with legitimacy underpinned by representative, elected local democratic structures that determine how power is exercised and that make local authorities accountable to citizens in their jurisdiction.</p> <p>[Source: UCLG, GOLD I, 2008]</p>

Disaster risk	Possibility of loss and injury.
	<p>Note: <i>Disaster risk</i> includes potential loss of life, disruption to lives and livelihoods (including injury, illness, danger, loss of sense of security or displacement), damage to or loss of property, and disruption of community activities which could occur to a system, a society, or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability, and/or capacity.</p>
	[Source: ISO/DIS 22327:2017 and UNISDR, 2017]
Disaster risk assessment	Qualitative or quantitative approach to determine the nature and extent of disaster risk by identifying and analysing potential hazards, and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods, and the environment on which they depend.
	[Source: UNISDR, 2017 with modification]
Disaster risk management	Coordinated activities to direct and control an organisation with regard to disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk, and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.
	<p>Note: Activities should encompass:</p> <ol style="list-style-type: none"> 1. Mitigation - the lessening or minimising of the adverse impacts of a hazardous event; and, 2. Preparedness - the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent, or current disasters.
	[Source: UNISDR, 2017 with modification]
Disaster risk reduction	Aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and, therefore, to the achievement of sustainable development.
	[Source: UNISDR, 2017]
Drinking water	All water either in its original state or after treatment, intended for drinking, cooking, food preparation, or other domestic purposes, regardless of its origin.
	<p>Note 1: Safe <i>drinking water</i> is water with microbial, chemical and physical characteristics that meet WHO guidelines or national standards on <i>drinking water</i> quality.</p>
	<p>Note2 : Sources of <i>drinking water</i> include household connections, public standpipes, boreholes, protected and unprotected dug wells, protected and unprotected springs, rainwater collection and surface sources, such as river, dam, lake, pond, stream, canal, and irrigation channels.</p>
	<p>Note 3: Access to <i>drinking water</i> means that the drinking water source is less than one kilometre away from its place of use and that it is possible to reliably obtain at least twenty litres per member of a household per day.</p>
	[Source: ISO 5667-5:2006 (en), 2.2 with added notes to entry]

Duty-bearers	<p>Individuals or institutions who have a particular obligation or responsibility to respect, promote, and realise human rights and to abstain from human rights violations.</p> <p>Note 1: The term is most commonly used to refer to State actors, but non-State actors can also be considered <i>duty-bearers</i>.</p> <p>Note 2: Depending on the context, individuals (e.g. parents), local organisations, private companies, aid donors, and international institutions can also be <i>duty-bearers</i>.</p> <p>[Source: UNICEF - Gender Equality, UN Coherence & You]</p>
Ecological footprint	<p>A quantitative measure looking at how much of the available biologically productive land and water an individual, a population, or an activity requires to produce the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. It is measured in standard units called global hectares.</p>
Economic diversity	<p>Extent to which economic activity of a given defined geography is distributed among a number of categories such as industries, sectors, skill levels, and employment levels.</p>
Ecosystem	<p>Dynamic complex of plant, animal, and microorganism communities and the non-living environment (e.g. soil, air, sunlight) interacting as a functioning unit of nature.</p> <p>Note: Everything that lives in an <i>ecosystem</i> is dependent on the other species and elements that are also part of that ecological community.</p> <p>[Source: ISO 14055-1:2017(en), 3.1.1 with addition of Note]</p>
Ecosystem services	<p>Benefit people obtain from ecosystems.</p> <p>Note: These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, waste generation, and water quality and cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling.</p> <p>[Source: ISO 14055-1:2017(en), 3.1.2 with addition of Note]</p>
Governance	<p>The enabling environment that requires adequate legal frameworks and efficient political, managerial, and administrative processes to enable the local government's response to the needs of citizens.</p> <p>[Source: UN-Habitat]</p>
Green infrastructure	<p>Strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of <i>ecosystem services</i>.</p> <p>Note 1: It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas.</p> <p>Note 2: <i>Green Infrastructure</i> is a tool for providing ecological, economic, and social benefits through natural solutions. It helps avoid relying on 'grey infrastructure' that is expensive to build when nature can provide cheaper, more durable alternatives.</p> <p>[Source: 2016 European Commission. Environment]</p>

Greenhouse gas emission(s) (GHG)	<p>Total mass of a <i>GHG</i> released to the atmosphere over a specified period of time.</p> <p>Note 1: Greenhouse gases (<i>GHGs</i>) are long-lived gases in the atmosphere that absorb infra-red radiation which would otherwise escape to space absorbing the radiation contributes to rising surface temperatures.</p> <p>Note 2: There are six major <i>GHGs</i>: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs), and sulphur hexafluoride (SF₆).</p> <p>Note 3: <i>GHGs</i> remain in the atmosphere for long periods of time, ranging from months to millennia.</p>
Grievance redress mechanisms	<p>System by which queries or clarifications about a certain matter are responded to, problems that arise out of implementation are resolved, and complaints and grievances are addressed.</p>
Gross Domestic Product (GDP)	<p>Measure of all final goods and services produced in the city within a certain period of time.</p>
Human rights	<p>Rights inherent to all human beings, whatever our nationality, place of residence, sex, national or ethnic origin, colour, religion, language, or any other status.</p> <p>Note 1: People are all equally entitled to <i>human rights</i> without discrimination.</p> <p>Note 2: <i>Human rights</i> are:</p> <ol style="list-style-type: none"> 1. interrelated, universal, and inalienable, interdependent and indivisible, 2. equal and non-discriminatory, and both rights and obligations.
Improved drinking water sources	<p>Sources that, by the nature of their design and construction, have the potential to deliver safe water.</p> <p>Note 1: It includes piped water, boreholes or tube-wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.</p> <p>Note 2: In order to meet the criteria for a safely managed drinking water service, people must use an improved source meeting three criteria: it should be accessible on premises, water should be available when needed, and the water supplied should be free from contamination.</p> <p>[Source: WHO-JMP-UNICEF, 2017]</p>
Inadequate structure	<p>Walls, ceilings, and floors built with materials, such as asbestos or zinc, or using techniques linked to the absence of appropriate know-how and maintenance, or loss of traditional knowledge based on experience.</p>
Indicator	<p>An indicator refers to a unit of measurement of the urban system and consists of a collection of <i>Supporting indicators</i> and <i>related questions</i>. Each <i>Component</i> is composed of a small number of Indicators</p>
Inequality	<p>State of not being equal, especially in status, rights, and opportunities.</p> <p>Note: <i>Inequality</i> can be measured economically (or monetarily), regarding living conditions, or based on rights and associated obligations (e.g. when people are not equal before the law, or when people have unequal political power).</p> <p>[Source: UNDP, 2015]</p>

Inflation	<p>Sustained increase in general price levels for all goods and services in an economy over time.</p> <p>Note: <i>Inflation</i> describes an erosion of the purchasing power of a unit of currency. It is usually expressed as an annual percentage rate of change on an index number.</p>
Informal business	<p>Unincorporated small or unregistered enterprises or productive units.</p> <p>Note 1: A productive unit is a formal or informal organisation that provides goods and/or services to the market.</p> <p>Note 2: An <i>informal business</i> is neither taxed nor formally monitored by any form of government.</p>
Informal sector	<p>Private unincorporated enterprises that are unregistered or small in terms of the number of employed persons (e.g. less than five employees).</p> <p>Note 1: An enterprise is unincorporated if it is not constituted as a separate legal entity, independently of its owner(s), and does not maintain a complete set of accounts.</p> <p>Note 2: Units engaged in the production of goods or services exclusively for own final use by the household are excluded from the <i>informal sector</i>, as are enterprises engaged in agriculture, hunting, forestry, and fishing.</p>
Investment	<p>Allocation of resources to achieve defined objectives and other benefits.</p> <p>Note: <i>Investment</i> takes two main forms: direct spending on buildings, machinery and similar assets, and indirect spending on financial securities, such as bonds and shares.</p> <p>[Source: The Economist, 2017; ISO/IEC 38500:2015(en), 2.13]</p>
Land consumption	<p>Expansion of built-up area which can be directly measured; absolute extent of land that is subject to exploitation by agriculture, forestry, or other economic activities; and over-intensive exploitation of land that is used for agriculture and forestry.</p> <p>[Source: EEA. 1997]</p>
Land tenure	<p>Relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land, determining how land is used, possessed, sold, or in other ways disposed.</p>
Local public debt	<p>Gross debt of the local public organisation under the following liabilities: 1) currency and deposits; 2) debt securities (bonds); 3) loans; 4) insurance pensions and standardised guarantees; and 5) other accounts payable (commercial debt, arrears).</p>
Municipal solid waste (MSW)	<p>Waste stream consisting of end-of-life-materials consisting mainly of waste generated by households, but may also include similar wastes generated by commerce and trade, small businesses, office buildings, and institutions (schools, hospitals, government buildings), and collected by or on behalf of municipal authorities.</p> <p>Note: The term 'municipal' is used in different ways from municipality to municipality and from country to country, reflecting different waste management practices.</p> <p>[Source: Eurostat, 2017 as modified by ISO 16559:2014(en), 4.134]</p>

Natural protected area (NPA)	<p>Clearly defined geographical space, recognised, dedicated, and managed through legal means or other types of efficient means to achieve the long-term conservation of nature with associated <i>ecosystem services</i> and cultural values.</p> <p>[Source: ISO 18065:2015(en), 3.6]</p>
Open access	<p>Specific rights are not assigned to anyone and no one can be excluded.</p>
Open area	<p>All the vacant areas - public or private - within the urban footprint.</p> <p>Note: Urbanised <i>open areas</i> are all fringe open space and captured open space pixels associated with the urban extent.</p>
Open data	<p>Publicly available data (preferably online) disseminated in a user-friendly way (metadata and machine-readable format) which is reusable and license free for distribution and publication.</p> <p>Note: It must also be universally accessible.</p>
Own-source revenue	<p>All governmental revenues that are raised directly by the municipality</p> <p>Note: Common <i>own-source revenues</i> include property/land taxes, fees, and charges for services and permits, locally imposed sales, use or income taxes, <i>investment</i> or rental income generated from city assets, among others.</p>
Para-transit	<p>Transport services that are available to be shared, without prior arrangement, by the general public.</p> <p>Note 1: <i>Para-transit</i>, however, is not considered as a part of the traditional public transport regulatory system.</p> <p>Note 2: <i>Para-transit</i>, in general, has the following characteristics:</p> <ol style="list-style-type: none"> 1. Services are usually unscheduled and often, though not always, are on demand-responsive routes; and, 2. The vehicles operated are typically small, including motorcycles and mini-buses. <p>Note 3: <i>Para-transit</i> services are usually provided by informal operators <i>with the following characteristics</i>:</p> <ol style="list-style-type: none"> 1. They are "non-corporate," usually operating as single-person enterprises; and, 2. They are often outside the tax system or benefit from favourable treatment of the non-corporate sector. <p>[Source: Roy, E. L., Rosemary, G. M, Transportation Engineering and Planning, Paratransit Systems, 2009]</p>
Participation	<p>Informed process of engagement with stakeholders, where key groups actively participate in defining the process and content of policy making.</p> <p>[Source: UNISDR, 2017 and ISO 22300:2018 (en), 3.187]</p>
Poverty	<p>State or condition of having little or no money/goods/means of support.</p>
Preparedness	<p>Activities, programmes, and systems developed and implemented prior to an incident that can be used to support and enhance prevention, protection from, mitigation of, response to, and recovery from disruptions, emergencies, or disasters.</p> <p>[Source: ISO 22300:2018 (en), 3.172]</p>

Private modes of transport	Transportation means that are not available for the general public, as they are not shared by strangers without prior arrangement.
Private sector	<p>For-profit enterprises, companies or businesses, regardless of size, ownership, and structure.</p> <p>Note: It covers all economic sectors and economic activities, ranging from local farmer organisations, cooperatives and small and medium enterprises to large international corporations. It includes private financial institutions, industry and trade associations, and consortia and coalitions that represent private sector interests (e.g., cross-industry multi-issue groups, cross industry issue-specific initiatives, industry-focused initiatives).</p>
Pro-poor land administration	<p>Inclusive system that extends land rights to all and recognizes all rights existing in a continuum.</p> <p>Note: It implies that a new, streamlined, affordable form of land recordings must be developed to record these different types of rights and link them to existing deeds and title systems.</p>
Product share	Proportion of the overall market (defined in terms of either units or revenue) accounted for by a specific product.
Public modes of transport	<p>Shared passenger transport services that are available to the general public and are shared by strangers without prior arrangement.</p> <p>Note: It ideally has well designed ‘stops’ and demarcated ‘routes’ that are both officially and/or formally recognised.</p> <p>[Source: UN-HABITAT, Unpublished manuscript, 2016]</p>
Public open space	<p>Areas within the urban footprint that are accessible for public use.</p> <p>Note 1: These are delimited by local planning.</p> <p>Note 2: <i>Public open spaces</i> encompass open air, outdoor areas in the city that are accessible by the public for recreational use, e.g. public parks, squares, recreational green areas, public playgrounds and widened pedestrian areas. It does not include streets, unless the city specifically indicates them as recreational space, nor areas devoted to public facilities that are not open to the general public.</p>
Recovery	<p>Restoration and improvement, where appropriate, of livelihoods and health, as well as economic, physical, social, cultural, and environmental assets, systems, and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.</p> <p>[Source: UNISDR, 2017 and ISO 22300:2018 (en), 3.187]</p>
Related Question	<i>Related questions</i> are structured similarly to <i>supporting indicators</i> , but the data collected are of secondary importance and generally not subject to a benchmarking process.
Resilience	<p>Ability to absorb and adapt in a changing environment.</p> <p>Note: In the context of urban resilience the ability to absorb and adapt to a changing environment is determined by the collective capacity to anticipate, prepare, and respond to threats and opportunities by each individual component of an urban system.</p> <p>[Source: ISO 22300:2018 (en)]</p>

Rights-holders	<p>Individuals or social groups that have particular entitlements in relation to specific duty-bearers.</p> <p>Note: All human beings are <i>rights-holders</i> under the Universal Declaration of Human Rights. A human rights-based approach does not only recognise that the entitlements of <i>rights-holders</i> need to be respected, protected, and fulfilled, but it also considers <i>rights-holders</i> as active agents in the realisation of human rights and development, both directly and through organisations representing their interests.</p> <p>[Source: UNICEF, Gender Equality, UN Coherence & You]</p>
Risk mitigation	<p>Lessening or minimizing of the adverse impacts of a hazardous event.</p> <p>[Source: UNISDR, 2017]</p>
Shocks	<p>Uncertain, abrupt, or long-onset events that have potential to impact upon the purpose or objective of an urban system.</p>
Social accountability	<p>Approach to governance that involves citizens and civil society organisations in public decision making.</p>
Social protection	<p>Preventing, managing, and overcoming situations that adversely affect people's well-being.</p> <p>Note: It consists of policies and programmes designed to reduce poverty and vulnerability by promoting efficient labour markets, diminishing people's exposure to risks, and enhancing their capacity to manage economic and social risks, such as unemployment, exclusion, sickness, disability, and old age.</p> <p>[Source: UNISDR]</p>
Social protection floor (SPF)	<p>Nationally defined sets of basic social security guarantees that should ensure, as a minimum that, over a life cycle, all in need have access to essential health care and to basic income security which together secure effective access to goods and services defined as necessary at the national level.</p>
Stakeholder	<p>Person or organisation that can affect, be affected by, or perceive itself to be affected by a decision or activity.</p> <p>Note: <i>Stakeholders</i> may include government entities, private sector, civil society, academia, and other major institutions from the local to the international level operating in the city.</p> <p>[Source: ISO 9000:2015, 3.2.3 and ISO 22300:2018 (en), 3.124]</p>
Stresses	<p>Chronic and ongoing dynamic pressures originated within an urban system with potential for cumulative impacts on the ability and capacity of the system to achieve its objectives.</p>
Stressor	<p>Factors, processes, activities or interactions that individually or conjointly lead to the generation of a <i>stress</i> in the urban system.</p>

Supply chains	<p>Two-way relationships of organisations and/or people with processes, logistics, information, technology, and resources engaging in activities and creating value from the sourcing of materials through the delivery of products or services.</p> <p>Note: The supply chain may include vendors, subcontractors, manufacturing facilities, logistics providers, internal distribution centres, distributors, wholesalers, and other entities that lead to the end user.</p> <p>[Source: ISO 22300:2018 (en) 3.251]</p>
Supporting Indicator	<p>A <i>supporting indicator</i> is the principal data collection unit for the City Resilience Profiling Tool (CRPT), consisting of a question or group of questions requiring a quantitative and/or qualitative response. The majority of data generated by <i>supporting indicators</i> are benchmarkable or quantitatively measurable.</p>
Sustainable modes of transport	<p>Transport that has zero or minimum effect on the environment due to the use of sustainable or regenerated energy.</p>
Trade balance	<p>Measure of how a given entity's (city, region, country, etc.) total imports by value compare to its total exports by value.</p> <p>Note: An excess of imports over exports is referred to as a trade deficit while an excess of exports over imports is described as a trade surplus.</p>
Urban	<p>Any town, city, or other human settlement.</p>
Urban agglomeration	<p>The physical structure and composition of an urban area or continuity of large urban clusters where the built-up zone or population density of an extended city or town area or central place and any suburbs are linked by continuous, connected urban development.</p>
Urban footprint	<p>Built-up area, the fringe open land, and the captured open land.</p>
Urban green space	<p>Urban space covered by vegetation of any kind.</p> <p>Note: This includes:</p> <ol style="list-style-type: none"> 1. smaller green space features (such as street trees and roadside vegetation); 2. green spaces not available for public access or recreational use (such as green roofs and facades, or green space on private grounds); and 3. larger green spaces that provide various social and recreational functions (such as parks, playgrounds, or greenways). <p>[Source: 2017. Urban Green Space interventions and health. World Health Organisation. Regional Office for Europe]</p>
Urban open area	<p>All the vacant areas – public or private – within the urban boundaries.</p> <p>Note 1: <i>Urban open areas</i> are all fringe open space and captured open space associated within the scope and parameters of the urban system.</p> <p>Note 2: State, national parks, or <i>open areas</i> in the countryside outside the parameters of the urban area are not considered, here, as <i>urban open areas</i>.</p>

Urban resilience

Ability of any urban system, with its inhabitants, in a changing environment, to anticipate, prepare, respond to, and absorb *shocks*, positively adapt and transform in the face of *stresses* and *constraints*, while facilitating inclusive and sustainable development.

Note 1: A more resilient urban system is characterised by its ability to continue through disruption in the short-to-medium term, combined with a capacity to reduce pressures and adapt to changes, risks and opportunities. *Urban resilience* therefore is dependent upon not just the ability of an urban system to deal with *shocks*, but also with chronic *stresses* and *constraints*.

Note 2: *Urban resilience* is dependent upon the individual and collective resilience of the separate components of a complex urban system. Although a city, town, or community within an urban area may individually demonstrate enhanced resilience within their respective boundaries, *urban resilience* encompasses the broader geographic scope of urban agglomeration. Resilience of an urban system is measured by the capacity of resilience for each individual system component and dependent upon the resilience of the weakest performer among the urban agglomeration within the system scope.

Note 3: In order to assess, plan and act accordingly in the face of *shocks*, *stresses*, and *constraints*, an urban system's capability for resilience should be measured and analysed through qualitative and quantitative data.

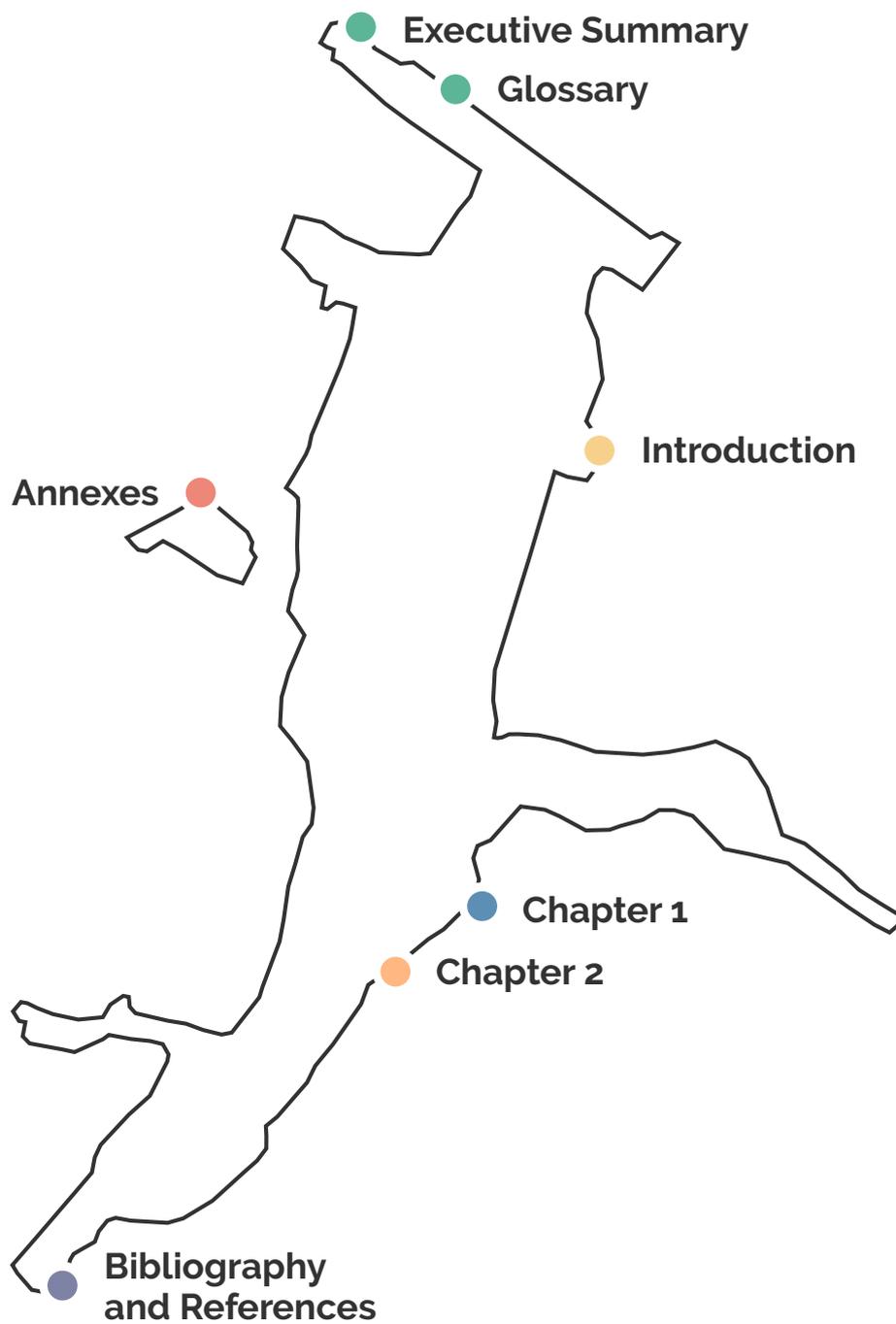
Waste picker

Persons who collect household, commercial, and industrial waste.

Note 1: They may collect from private waste bins on the curb or from dumpsters, along the streets and waterways or on municipal dumps and landfills.

Note 2: They salvage reusable or recyclable materials thrown away by others to sell or for personal consumptions.

Note 3: *Waste pickers* include those formally contracted by municipalities and private entities, but also all of those working informally.



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List of acronyms and abbreviations

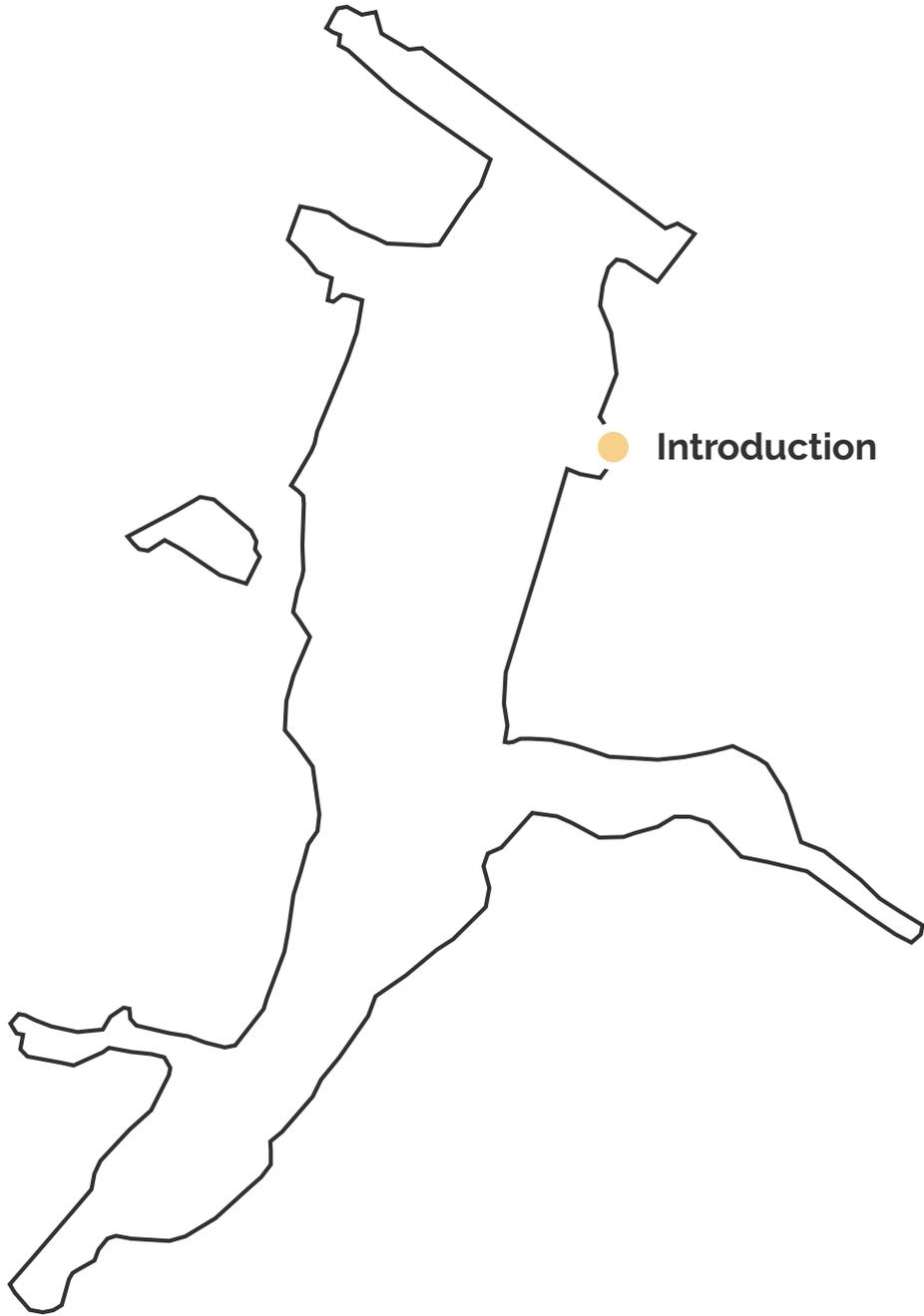
RAR-S	Recommended Actions for Resilience and Sustainability
ADB	Asian Development Bank
ATM	Automatic Teller Machine
CA	Climate Action
CC	Climate Change
CDCs	Community Disaster Committees
COM	Council of Ministers
CRPP	City Resilience Profiling Programme
CRPT	City Resilience Profiling Tool
CSO	Civil Society Organisation
DEPC	Department of Environmental Protection and Conservation
DFAT	Australian Department of Foreign Affairs and Trade
DLA	Department of Local Authority
DoL	Department of Lands
EbA	Ecosystem-Based Adaptation
EC DEVCO	Directorate-General for International Cooperation and Development
ESRAM	Ecosystem and socio-economic resilience analysis and mapping
EWS	Early Warning Systems
FSA	Farm Support Association
FSAC	Food Security and Agriculture Cluster
FRANZA	France, Australia and New Zealand partnership
GE	Gender Equality
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Risk Reduction
GIS	Geographical Information System
HCV	Heavy Commercial Vehicle
I	Informality
ICT	Information and Communication Technology
ILO	International Labour Organization

List of acronyms and abbreviations

IUCN	World Conservation Union
IWRM	Integrated Water Resource Management
JICA	Japan International Cooperation Agency
LCV	Light Commercial Vehicle
MALFFB	Ministry of Agriculture, Livestock, Forestry, Fisheries and Biosecurity
MOH	Ministry of Health
MoIA	Ministry of Internal Affairs
MoL	Ministry of Lands
MOU	Memorandum of Understanding
MSG	Melanesian Spearhead Group
NAB	National Advisor Board for Disaster Risk Reduction
NAMA	Nationally Appropriate Mitigation Action
NCDs	Non-Communicable Diseases
NDC	National Disaster Committee
NDMO	National Disaster Management Office
NETC	Vanuatu National Emergency Telecommunications Cluster
OGCIO	Vanuatu Office of the Government Chief Information Officer
PDCs	Provincial Disaster Committees
PI	Poor Infrastructure
PVMC	Port Vila Municipal Council
RAR-S	Recommendations Actions for Resilience and Sustainability
RCP	Representative Concentration Pathway
SDGs	Sustainable Development Goals
SOPs	Standard Operating Procedures
SPCZ	South Pacific Convergence Zone
SPREP	Secretariat of the Pacific Regional Environment Programme
TRR	Telecommunications and Radio-Communications Regulator
UNDP	United Nations Development Programme
UNELCO	Union Electrique du Vanuatu Limited

List of acronyms and abbreviations

UNDRR	United Nations Office for Disaster Risk Reduction
UNICEF	United Nations Children's Fund
UN-Habitat	The United Nations Human Settlements Programme
VCCI	Vanuatu Chamber of Commerce and Industry
VCR	Vanuatu Red Cross
VHT	Vanuatu Humanitarian Team
VMGD	Vanuatu Meteorology and Geo-Hazards Department
VNSO	Vanuatu National Statistics Office
VSPD	Vanuatu Society for People with Disabilities
WASH	Water Sanitation and Hygiene
WB	World Bank
WHO	World Health Organisation



Introduction

Introduction

As a pilot city for the "Making Cities Resilient and Sustainable" (MCRS) project, the Port Vila Municipal Council (PVMC) has been working closely with UN-Habitat for the last two years using the *City Resilience Profiling Tool* (CRPT) to create a comprehensive profile of the city and design a series of Recommended Actions oriented to improve its urban resilience. The City Resilience Profiling Program (CRPP) would like to express its gratitude to the Port Vila Municipal Council for its commitment to serving as a pilot city for the MCRS project.

The CRPT provides a universal framework that uses verifiable and contextualised city data to establish a resilience profile and create an analysis and diagnosis of its most urgent challenges. This profile and diagnosis provide a basis for the creation of evidence-based and implementable *Recommended Actions for Resilience and Sustainability*, which are designed to be incorporated into current urban development strategies and management processes of the city. This process is intended to support the Port Vila Municipal Council and its partners in making informed decisions and, in turn, support long-term resilient and sustainable urban development.

The *Recommended Actions for Resilience and Sustainability Report* (RAR-S) presents the culmination of the work carried out throughout the CRPT implementation process and provides a summary overview of the analytical process through which the *Recommended Actions for Resilience and Sustainability* have been developed.

The introduction of this report briefly presents the CRPT methodology, which serves as the basis for the analytical findings presented in the following chapters. Although the RAR-S report seeks to summarize the multifaceted implementation process, the analytical and diagnostic efforts, and the development of concrete recommendations for actions to build resilience in the pilot cities, it does not seek to provide details of the methodological basis from which the CRPT was developed, nor of the analytical process in its entirety, given its extensiveness. Please refer to the *CRPT Implementation Manual* for a detailed description of the CRPT implementation process.

CRPP: Main Concepts

UN-Habitat's flagship tool for urban resilience, the City Resilience Profiling Tool (CRPT), provides a cross-cutting, action-oriented approach to resilience and sustainable urban development. Its methodology is based on UN-Habitat's definition of urban resilience, shown below, which encompasses a theoretical approach followed by a more practical description on what resilience-building efforts entail and target.

This definition and understanding of resilience outline the overall objective for each city implementing the CRPT. A shared understanding of resilience is crucial in catalysing stakeholder engagement and garnering buy-in from partners.

The measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability.

A resilient city evaluates, plans and acts to prepare and respond to threats - natural or man-made, sudden and slow onset, expected and unexpected - in order to protect and improve the lives of people, to ensure development, foster an investment environment and drive positive change.

In addition to definition of urban resilience, the following **Urban Resilience Principles**, which are integrated into the structure, design, and implementation of the CRPT, guide cities in urban resilience development.



Principle 1 Dynamic nature of urban resilience

Resilience is not a condition but a state, which cannot be maintained unless the system evolves, transforms, and adapts to current and future circumstances and changes. Therefore, the creation of resilience requires the implementation of flexible and context-specific plans and actions that can adjust to the dynamic nature of risk and resilience.



Principle 2 Systemic approach to cities

Recognise that cities are composed of interconnected systems through complex networks and that changes in one part of it have the potential to spread across the entire network. Building resilience requires a broad and holistic approach that takes into account these interdependencies when the urban system is subject to disturbances.



Principle 3 Participation in planning and governance

A resilient system guarantees the protection of life, the reduction of damages and an improvement of the prosperity of its inhabitants through the promotion of inclusion and of a broad and meaningful participation of all, in particular those in situations of vulnerability; in planning and in various governance processes. This approach can guarantee the sense of ownership, thus achieving the successful implementation of plans and actions.



Principle 4 Commitment of all the agents

A resilient system must guarantee the continuity of governance, economy, trade, and other functions and flows of which its inhabitants depend on. This requires promoting open communication and facilitating integrative collaborations among a wide range of stakeholders, from public entities, the private sector, civil society, and the academia, for all the city's inhabitants.



Principle 5 Oriented towards the Sustainable Development Goals (SDG)

The creation of resilience must promote, safeguard, and sustain the Sustainable Development Goals (SDGs). Resilience-based approaches should ensure that efforts to reduce risk and alleviate certain vulnerabilities do not generate or increase others. They must also ensure that human rights are accomplished, respected, and protected.

CRPP: Methodology and Alignment with International Agenda 2030

The implementation of the CRPT is characterised by four overlapping steps:

1. Data collection
2. Analysis
3. Diagnosis
4. Recommended Actions for Resilience and Sustainability

The CRPT is organised in four SETs that facilitate data collection and analysis. Each SET has a specific focus, through which the entire urban system is mapped, analysed, and interrelated. The data analysed throughout these SETs is derived from existing databases, official documents, research, and publications. While this data provides quantitative information to conduct a city-based analysis of the evidence, the findings are complemented by qualitative sources collected through workshops and expert readings in an attempt to capture the nuances of the city and the realities of the context. Collectively, the collection and analysis of quantitative and qualitative data leads to an in-depth diagnosis of the city, which provides a basis for the development of *Recommended Actions for Resilience and Sustainability*.

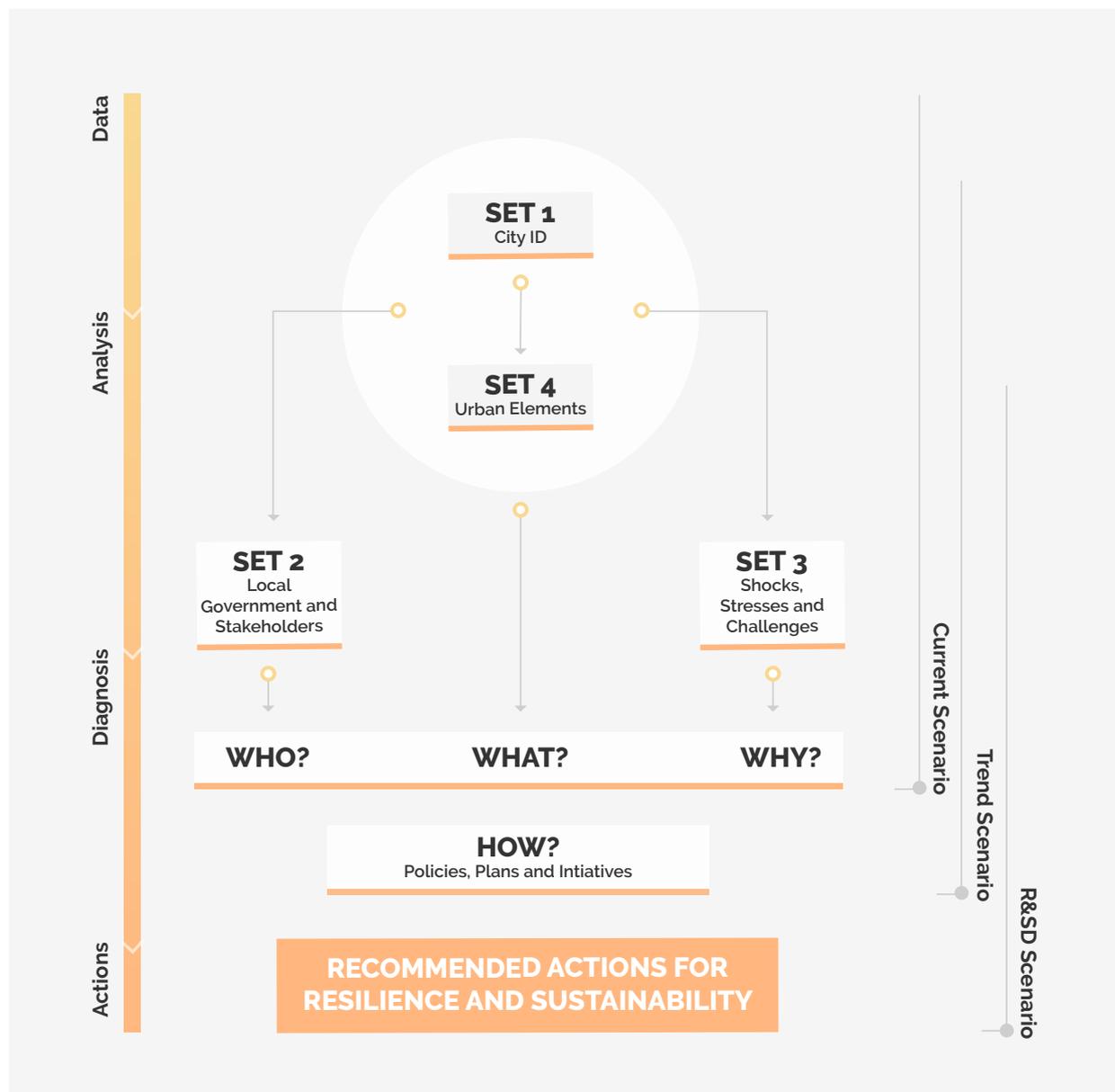


Figure 3: CRPP Implementation Process Diagram. Source: CRPP (2018).

As is illustrated in the **Figure 3**, data is primarily collected in SET 1 – *City ID*, for context-related information, and in SET 4 – *Urban Elements*, for performance-related information. This data provides a basis to analyse the current strengths and weakness of the Urban System and its performance – the WHAT.

Following this synthesis of data comprising the WHAT, information gathered regarding key stakeholders (including the local government) and *shocks*, *stresses*, and *constraints* (to which the city is found to be more or less vulnerable) are incorporated into the analysis.

SET 2, the WHO, gathers information related to stakeholders which is used to analyse the role and relationships of the different institutions and organisations that act in the city and to identify the most influential actors. SET 2 includes an analysis of the local government, generating a map of the structure, functions, and responsibilities of the local government. In addition, SET 2 includes a general description of the main stakeholders external to the local government (regional, provincial, National Government, private companies, community organisations, NGOs, etc.).

SET 3, the WHY, identifies and prioritises the *shocks*, *stresses*, and *constraints* present in the city. Experts evaluate the severity of potential impact of each *shock* by assessing whether or not, and to what degree, risk reduction measures have been established in the city.

The HOW – the policies, plans, and initiatives – portion of the CRPT evaluates existing development efforts. It uses the data collected in the aforementioned four SETS to map WHAT the issues are, WHO are able to act, and WHY action should be taken, ultimately establishing areas of focus, gaps, and overlaps and the formulation of actions to improve resilience.

Lines of Action

Lines of Action are prioritised thematic areas from which implementable actions are developed. *Lines of Action* are derived collaboratively with the local government and other key stakeholders through the quantitative and qualitative processes described above. Following a consolidation of findings and integration of key stakeholder input, the local government and experts from the CRPP team form a focused, consensus-derived path towards resilience. The *Lines of Action* present a culmination of collected data findings and preliminary analytical efforts, in combination with key stakeholder input gathered during workshops conducted in conjunction with the local government. These *Lines of Action* can vary in scope but relate directly to both quantitative and qualitative information, representing a synthesis of each methodological step in the CRPT implementation.

Based on these *Lines of Action*, the *Recommended Actions for Resilience and Sustainability* are developed and proposed in order to co-create a resilient and sustainable roadmap for the city. These actions are intended to be both implementable and feasible, precise in targeting, and ambitious in their expected impact.

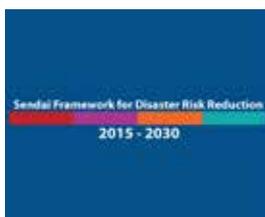
Developing Recommended Actions for Resilience and Sustainability

The aim of this report is to better inform local governments, in this case the Port Vila Municipal Council, of the state of the city with regards to resilience, based on conclusions derived from of the CRPT implementation process. *Recommended Actions for Resilience and Sustainability* constitute the final product of UN-Habitat's City Resilience Profiling Program (CRPP) implementation process and provide the local government with actionable paths through which to make Port Vila more resilient.

Alignment with international frameworks and agendas

This methodology is developed in line with global intergovernmental frameworks – Sustainable Development Goals, Sendai Framework for Disaster Risk Reduction, Paris Agreement on Climate Change, World Humanitarian Summit: Agenda for Humanity, and the New Urban Agenda. Aligning CRPT with these frameworks enables the local governments who have implemented CRPT to better understand, report and deliver on specified targets.

Sendai Framework for Disaster Risk Reduction



The Sendai Framework requires resilience at all levels of planning, local, regional, and national. The CRPT contributes to the overall objective of the document: reduce vulnerability to disasters and increase preparedness for response and recovery, and contributes to the four priorities for action:

- **Priority 1:** Build knowledge based on evidence on disaster risk reduction.
- **Priority 2:** Strengthen governance frameworks against disaster risk through the adoption of plans.
- **Priority 3:** Invest in risk reduction and resilience.
- **Priority 4:** Expand the preparation of the stakeholders and an "early recovery" approach.

Sustainable Development Goals



Urban resilience is related to key elements of sustainable urban development and to the objectives of the Post-2015 Sustainable Development Agenda, in particular with Objectives 1, 2, 3, 9, 11, 13 and 14, where reference is made to resilience, but also with other objectives where it appears implicitly. Resilience is an important component of many of the objectives set out in the entire preamble and paragraphs 7, 9, 14, 23, 29 and 33 of the Declaration to the SDGs.

Paris Agreement on Climate Change



Article 7 requires the strengthening of resilience in the face of climate change as a premise of sustainable development. Resilience in cities requires the involvement of local governments in the following principles of the Paris Agreement:

- Adaptation to the impacts of climate change
- Minimisation of losses and damages related to climate change
- Local resilience construction



World Humanitarian Summit – Agenda for Humanity

The main responsibilities defined in the World Humanitarian Summit are related to the construction of resilience. The approach adopted by UN-Habitat for building resilience contributes to priorities 1D, 4A, 4B, 4C and 5A.

New Urban Agenda



Resilience is related to some of the key objectives of the New Urban Agenda agreed by Member States during Habitat III:

- a. New paradigms of urban planning for resilience.
- b. Legal and regulatory frameworks that allow adequate governance in urban development.
- c. Analysis of inherent risks in urban areas.
- d. Promotion of good practices related to the local economy and strategies to promote safe and sustainable cities.

CRPP: Implementation Process in Port Vila

The commitment of the Port Vila Municipal Council to implement the CRPT methodology and thus to better understand and improve urban resilience in the city, began in the first quarter of 2018 with the reengagement of the Port Vila Municipal Council. As illustrated below in the timeline for Port Vila's implementation, the program was formalised in October 2018 through the signing of a Letter of Agreement between the Port Vila Municipal Council and the CRPP Program. Shortly thereafter, data collection began in earnest and was completed by February of 2019 in anticipation of the first of two workshops held in April 2019.

In tandem with reengagement between the PVMC and CRPP, a Focal Point was recruited to serve as the responsible party for collecting data and liaising with the PVMC. The Port Vila Focal Point, to prepare for this role, attended training on the topic of urban resilience and the CRPT tool, with emphasis on gathering and analysing data. In the case of Port Vila, data collection efforts were led by the Focal Point, who engaged with a variety of stakeholders from the public, private and non-profit sectors. By the end of the implementation process, the Focal Point was provided an office within the PVMC, allowing for a more direct engagement with Municipal staff and elected officials.

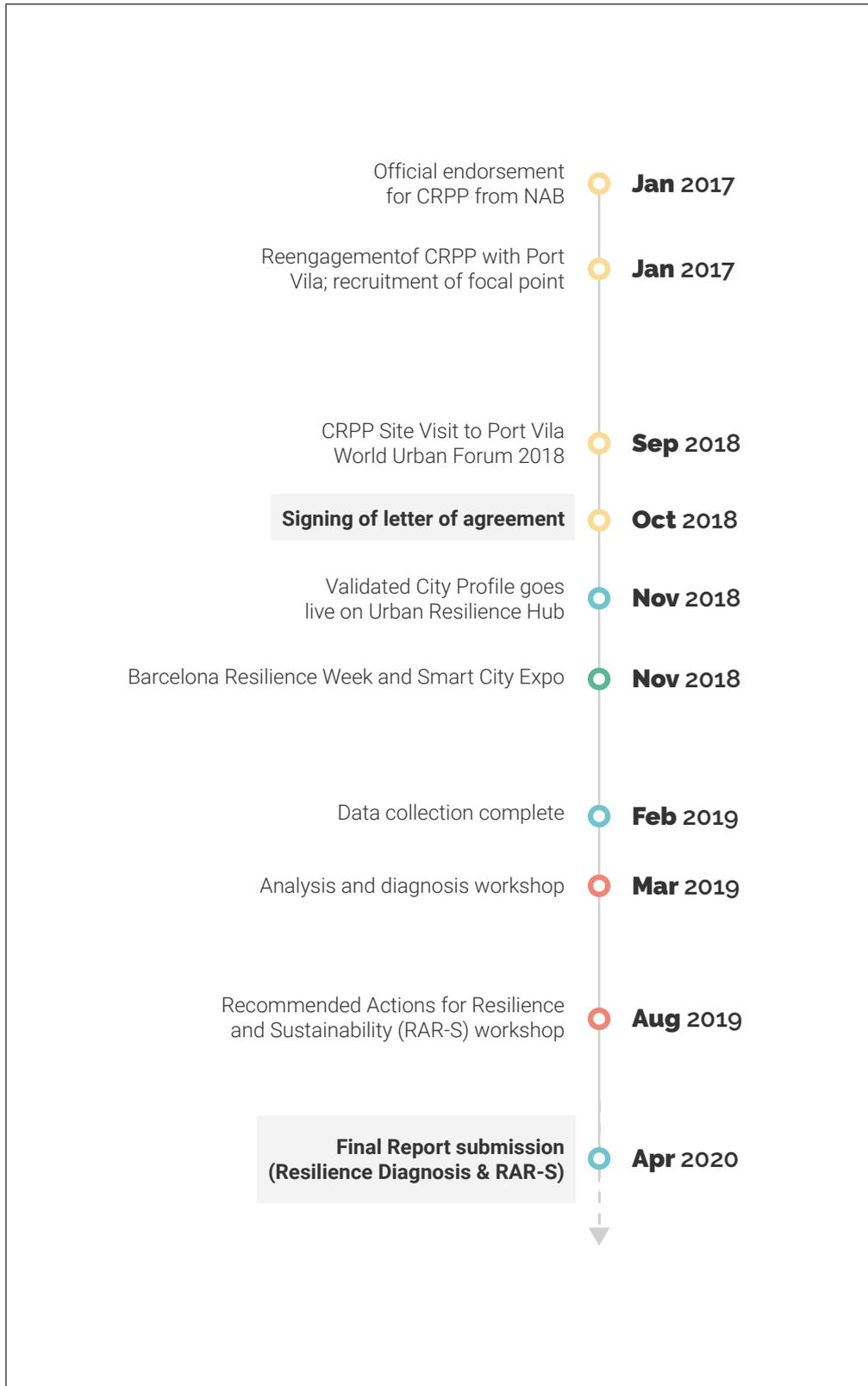
Over the course of the implementation process, three missions were carried out to conduct training on the City Resilience Profiling Tool and promote collaboration with the PVMC and other key local stakeholders in the development actionable, resilience-building findings. In addition, these missions served as vehicles for catalysing participation by a wider range of stakeholder, encouraged more ambitious and thoughtful analysis of the city's challenges, and allowed for a participant-led design of *Recommended Actions for Resilience and Sustainability*.

The CRPT was implemented in Port Vila following the methodology described above. In the initial stages of implementation, a contextual narrative is developed, providing a general vision of the city. Building off of this general vision, and through an evaluation of *shocks, stresses, constrains*, and key actors, a city profile is created.

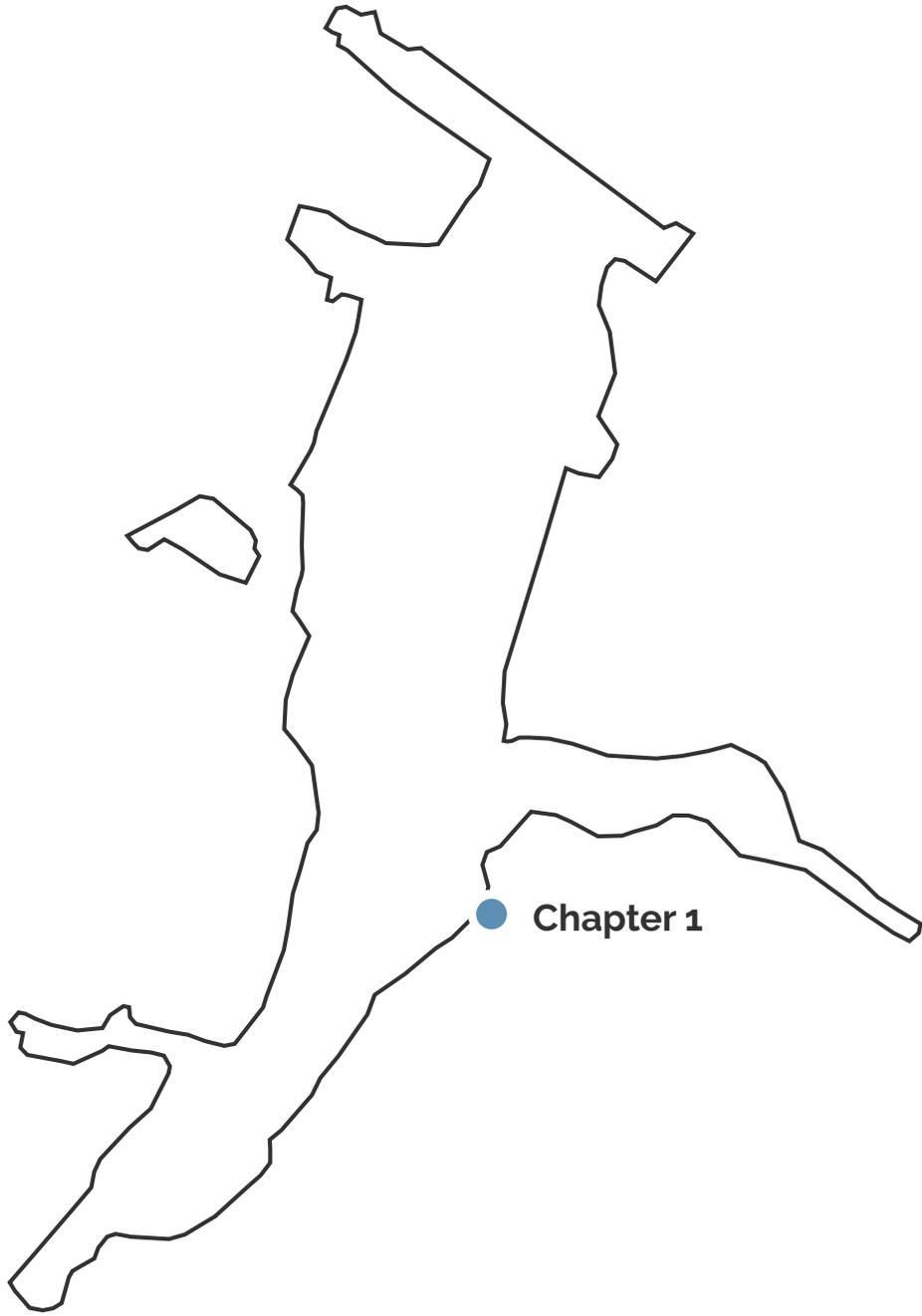
During the mission held in April 2019, validation of the pre-diagnosis and identification of the *Lines of Action* were carried out. After incorporating complementary information, a workshop focusing on developing and fleshing out *Recommended Actions for Resilience and Sustainability* (referred to herein as the RAR-S Workshop) was held in August 2019. The RAR-S Workshop included the participation of key members of the municipality, national government, locally-operating NGOs, and stakeholders from the private sector.

Based on the results of the analytical and diagnostic process described, the final version of the *Recommended Action for Resilience and Sustainability* (RAR-S) report was prepared, which includes a series of proposed *Recommended Actions for Resilience and Sustainability*, prioritised by both feasibility (primarily economic and political) and projected benefits for Port Vila. The *Recommended Actions for Resilience and Sustainability* report serves as a contribution to the development of a roadmap for Port Vila based on urban resilience concepts that are transversal and integral in nature and allow for sustainable development. The official launch and distribution of the report will be held in April 2020 (see **Annex I. Process of Implementation of the CRPT in Port Vila**).

Figure 4: Timeline of CRPP Implementation Process in Port Vila. Source: CRPP (2019).



- Milestone events
- Major stages in implementation
- Other workshops / training missions
- Port Vila participation in events



Chapter 1
Port Vila in Context:
Identification of Shocks,
Stresses and Constraints

Chapter 1

Port Vila in Context: Identification of Shocks, Stresses and Constraints

As described in the introduction, the methodology which guided the CRPP implementation in Port Vila relies upon a series of interconnected and overlapping processes. The structure of this chapter seeks to present these various processes in an accessible manner, and in doing so, describes these processes in a more or less linear structure. However, it should be noted that in practice, many of data collection, analytical, and participatory processes were undertaken simultaneously.

The information presented in this chapter required a combination of local contextual knowledge, statistical analysis, participatory workshops with key local stakeholders, a preliminary mapping of key stakeholders, and an understanding of the local government's structure, competencies, capacities, and political priorities, and an identification and prioritisation of *shocks*, *stresses* and *constraints* present in the city. The composition of these inputs enabled a holistic understanding of a city's resilience and a basis for from which to develop recommendations of concrete actions.

The chapter begins with a brief overview of the Port Vila context, followed by a high-level summary of the city's *Urban Performance*, as derived from the data collection and analysis centred around *indicators* developed as part of the *City Resilience Profiling Tool* (CRPT). Further detailed information on both the context of Port Vila and its *Urban Performance* can be found in **Annex II. City Characterisation** and **Annex III. Urban Performance Overview**, respectively. The chapter then discusses the analyses and derived key findings regarding the local government and key stakeholders operating in the city, as well as *shocks* and *constraints* facing Port Vila. A more in-depth description of the identification and prioritisation of *shocks* can be found in **Annex IV. Shocks Analysis** and a more systematic discussion of the roles of various stakeholders is presented in **Annex VI. Local Government Stakeholders Analysis**. Lastly, this chapter documents the processes by which *stresses* were identified, prioritised, and subsequently used to determine three thematic priority areas referred to as *Lines of Action*. *Lines of Action* serve as the bridge between identified *shocks*, *stresses*, and *constraints* – as well as information collected regarding stakeholder dynamics and other context-specific data – and the *Recommended Actions for Resilience and Sustainability* discussed in **Chapter 2**.



Image 2: Port Vila, Vanuatu. Source: Groovy Banana 2020.

1.1. Context of the City of Port Vila

Since gaining independence in 1980, Port Vila has served as Vanuatu's capital and largest city, administrative and economic centre, and location for its most prominent educational institutions.

After gaining greater economic importance as a trade and transportation hub within the Vanuatu archipelago during the 18th and 19th centuries, Port Vila's current incarnation has largely been shaped by the country's establishment as an international tax haven in the 1970s and expansion and modernisation of the port and wharf in Vila Harbour over the past four decades, leading, in part, to a building boom, expansion of the tourism industry, and rapid growth in population. An aerial map of the city's official municipal boundaries is shown in **Figure 5**.



Figure 5: Port Vila Landmarks and Critical Facilities.

The most recent national census estimates Port Vila's population to be approximately 51,000, or roughly 20 percent of Vanuatu's total population. However, a 2014 estimate by the Vanuatu National Statistics Office found the population of Greater Port Vila to be nearly 85,000, indicating that approximately 40 percent of the urban area's population resides outside of the administrative boundaries where the majority of recent growth has been concentrated.

Like most other Pacific nations, Vanuatu is highly dependent on foreign imports such as fossil fuels, on which the country relies not only for mobile and stationary use, but for electricity generation. Indeed, over 80% of all electricity generation in Vanuatu relies on imported diesel fuel. While this trade-dependent economic composition is not uncommon with island nations, given the city's physical isolation, as illustrated in **Figure 6**, and related dependencies, it remains quite vulnerable to economic reverberations in the global market.

Port Vila faces extensive environmental threats, evident in its recent ranking as the “world’s most exposed city to natural disasters”. Located within the South Pacific Convergence Zone, cyclone belt, and approximately 50km east of the New Hebrides Trench, Port Vila is subject to a wide array of natural hazards including earthquakes, wave action (including storm surge and tsunami), cyclones, extreme rainfall and flooding. Such environmental threats, many of which are linked to the impacts of rapid urbanisation and climate change, are exacerbated by the existence of impoverished people, limited economic opportunity, lack of institutional capacity and tenuous connectivity to external markets.



Figure 6: Port Vila's Geographic Isolation.

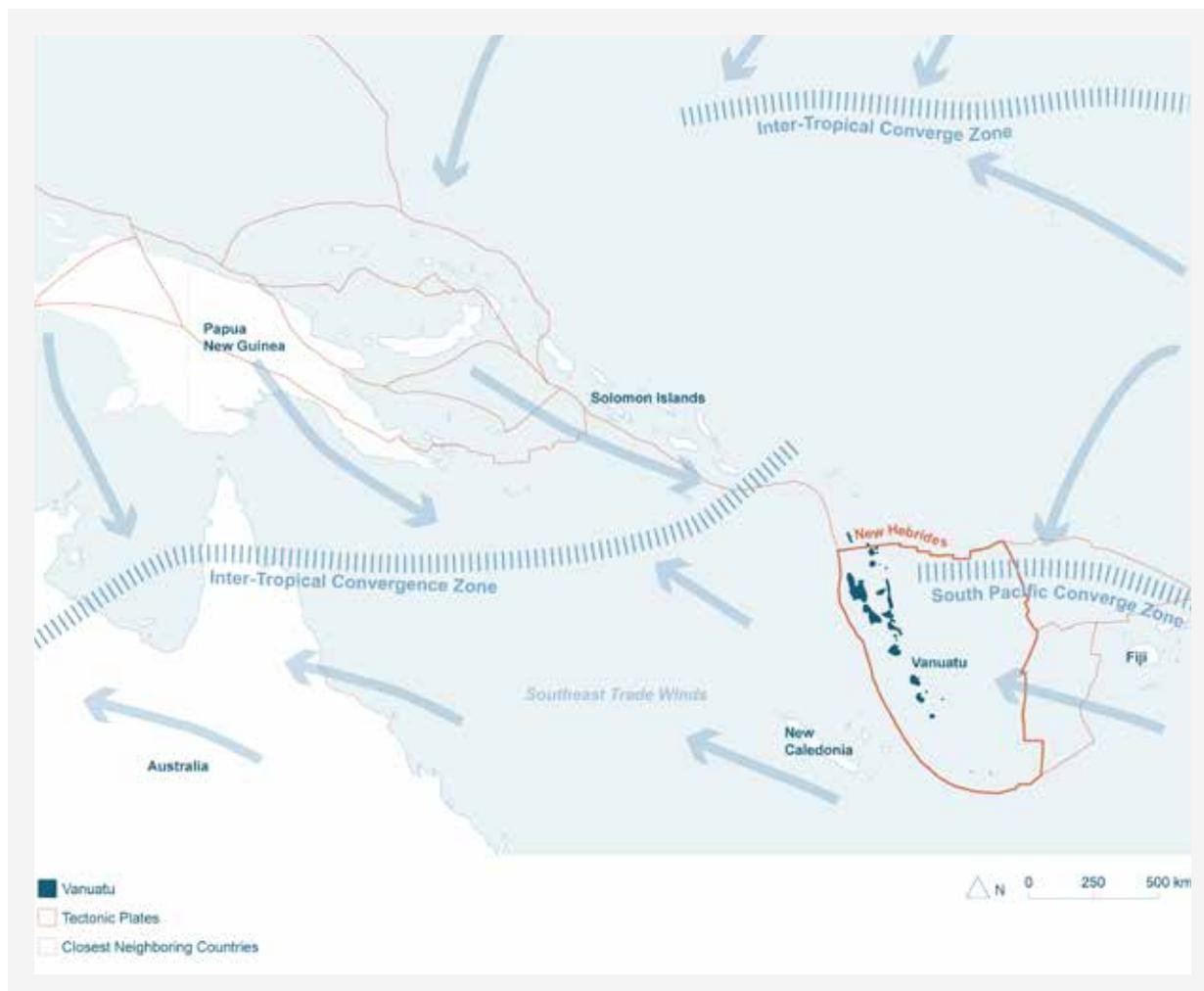


Figure 7: Geographic Exposure to Environmental Hazards.

A summary of additional key data about Port Vila can be found in the table below.

Port Vila key data	
Total urban footprint:	24.3km
Altitude:	59m
Köppen-Geiger Climate classification system:	Tropical rainforest
Highest recorded temperature:	37.2 degrees
Average annual rainfall:	1500 - 4000 millimetres annual rainfall
Population:	84,895 Greater Port Vila estimate (VNSO 2014)
Population density:	84,895 / 24.3km ² = Approx. 3,500 persons/km ²
Population average age:	23 (2016; Urban Areas)
Average household size:	4.8
Average household income:	37,600vt per month (USD 352)
Religion (%)	Predominately (over 90%) Christian
Life expectancy (years):	75.4 (2017; Vanuatu)
Languages (%)	Bislama, French, and English
Mortality rate (%)	4/1,000 (2017; Vanuatu)
Literacy rate (%):	98% (2009; <i>Economic Census</i>)

Table 1: Key Geographical, Climatic and Socioeconomic Data for Port Vila. Source: CRPP (2019).

1.2. Analysis of Port Vila's Urban Performance

The *Urban Performance* of Port Vila refers to the statistical profile developed based on the accumulation and analysis of data collected over the course of approximately eight months. While the Port Vila context surely presented challenges regarding data collection, the resulting level of completion, illustrated below, is considered robust, and most importantly, sufficient to conduct more granular analyses by sector, thematic area, *stresses*, or otherwise.

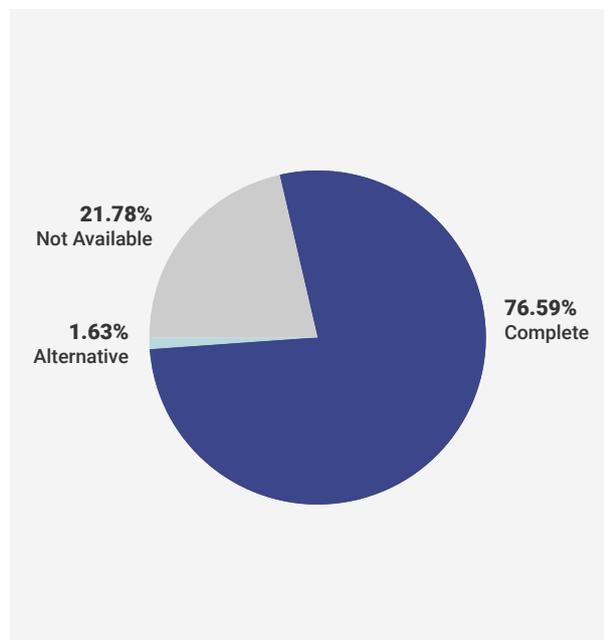


Figure 8: Urban Performance Data Completion.

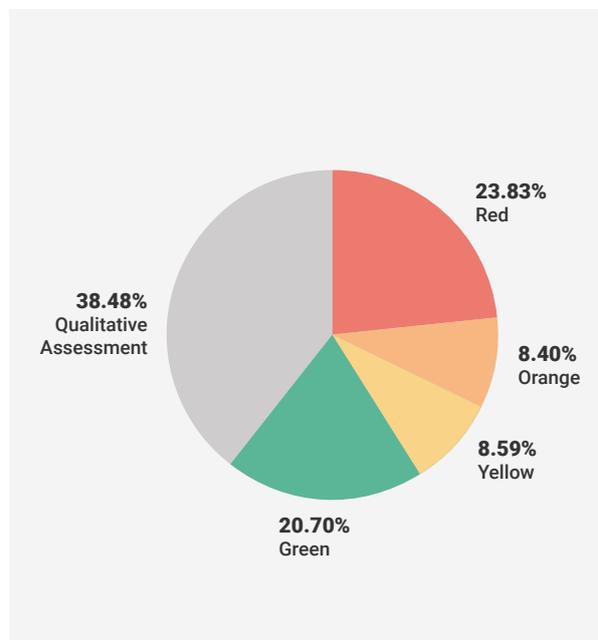


Figure 9: Urban Performance Data Assessment Summary.

The principal data collection unit for the City Resilience Profiling Tool (CRPT) is referred to as a *supporting indicator*, which consists of a question or group of questions requiring a quantitative and/or qualitative response. The majority of data generated by *supporting indicators* are benchmarkable or quantitatively measurable. Supporting indicators are organised in several *Urban Elements* or thematic groups, addressing sectorial information regarding: *Built Environment, Supply Chain and Logistics, Basic Infrastructure, Mobility, Municipal Public Services, Social Inclusion and Protection, Economy, and Ecology*. For Port Vila, it was possible to collect information corresponding to approximately 78% of the nearly 650 *supporting indicators* and *related questions*. Data completion rates were generally highest for *Economy, Mobility, Municipal Public Services, and Supply Chain & Logistics*.

The vast majority of the *supporting indicators* gathered about the city of Port Vila are benchmarkable (i.e. information gathered allows for a measurable assessment), and approximately 53% of these benchmarkable *supporting indicators* and *related questions* suggest a favourable situation of the city of Port Vila on issues related to resilience and urban sustainability.

However, more than 47% of the results indicate that there are aspects in the current state of the city with respect to resilience which could be improved. A detailed analysis by *Urban Element*, which describes in greater detail many of the *stresses* identified through data analysis that affect the city of Port Vila, can be found in **Annex III: Urban Performance Overview**, however selected key findings from analysis for the eight *Urban Elements* is provided below.

Urban Performance Key Findings

An initial sectorial assessment (i.e. by *Urban Element*) of the data suggest a number of findings that will help to inform the subsequent identification of multisector stresses:

- Urban expansion, both unplanned and planned, is continuously pushing into hazardous and environmentally-sensitive areas, increasing vulnerabilities and decreasing restorative and defensive services provided by the ecosystem.
- The high reliance of urban populations on purchased food, particularly imported foods, increases the vulnerability to food insecurity particularly in times of natural disaster and increases in international food prices.
- Port Vila residents pay among the highest retail prices for electricity and petroleum products in the world. While fuel prices are determined by the international supply chain, price volatility and supply *shocks* are exacerbated by the inefficiencies in the domestic supply chain. Managing aspects of the supply chain that are within Vanuatu's control can help to make fuel supply more reliable and efficient, and, as a result, more affordable.
- In urban areas the proximity of unhygienic sanitation facilities to formal and informal water sources is a significant concern. There is a need for investment in sanitation and sewage treatment as reliance on current sludge disposal methods is both unsustainable and will become increasingly hazardous as population growth continues.
- As public transport is privately owned (individual operators), there exists no central control system in Port Vila. As congestion worsens as the population and economic activity of Port Vila continue to increase, this lack of centralised planning for buses will likely exacerbate existing challenges such as high commute times and demand-driven disruptions (tourists) in public transport service.
- Poor coverage of property tax collection and associated property rating system impede support of the quality and expansion of public services. Investment in improving property tax collection methods could potentially be recouped through increased revenues stemming from a broadened tax base.
- Apart from a ministry dedicated to youth, policy makers and community leaders do not have in place many programs or policies addressing the welfare of youth in Port Vila. This dynamic is exacerbated by that lack of work opportunities for youth, especially those with limited education, and results in many youths remaining marginalised. There is a lack of effective mechanisms promoting participation due to the absence of economic support for such initiatives.
- Local and international non-government organisations (NGOs) play an important role in community resilience actions in the city related to ecological vulnerabilities. For example, Wan Smol Bag Theatre Company provides education on sustainable use of resources and also provides waste collection services for in informal settlements.

1.3. Analysis of Local Government and Stakeholders

The analysis of governance and actors is informed by direct information about the administrative structure of the local government as well as its roles and responsibilities, the local government's relationship with other government entities, PVMC budgetary information regarding revenues and expenditures, and extensive mapping of key stakeholders from the government, non-governmental and private sector actors by sector (i.e. by *Urban Element*). The combination of these efforts has resulted in a holistic understanding of the key actors operating in Port Vila as well as of the capacities of the local government. While more in-depth information on these subjects can be found in **Annex VI. Local Government and Stakeholder Analysis**, this section first provides a summary of two key mutually reinforcing forces that shape the relationships between the local government and other key stakeholders operating in Port Vila. Secondly, key findings derived from the broader analysis are presented.

Prominence of external actors

Given the extent to which foreign governments and international non-governmental organisations operate in Vanuatu and impact the dynamics of Port Vila, the way in which these entities continue to interact with the city will significantly impact urban trends. For instance, to what extent physical infrastructure and other capital improvement projects -- funded by entities outside of the private sector and/or local, regional or national government -- will be pursued going forward, and what priorities such projects address, will directly relate to where local resources and capacities can be directed to ensure the greatest positive impact. Furthermore, the degree to which these investments are coordinated within a cohesive long-term plan for Port Vila will inform the benefits generated to the city in areas of access to services, economic development, and governmental capacity, among others.

Limited competencies of local government

The local government is responsible for the control, management and administration of the municipality. Specific competencies include developing, controlling and managing land taken on lease from any statutory land authority including any housing estates thereon, managing refuse collection and disposal, overseeing cemeteries, maintenance of local roads, parks and open spaces, and the promotion of tourism.

Key activities undertaken by the Port Vila Municipal Council are:

- Control, manage and administer the municipality
- Develop, control and manage land taken on lease from any statutory land authority
- Maintenance of public areas (parks and public halls)
- Keeping Port Vila clean and tidy
- Managing and collecting property taxes

While these competencies provide ample areas to evaluate and improve upon, it should be noted that municipal responsibilities common in many cities around the world do not fall under the purview of the local government such as police, fire or emergency services, education (although there is some involvement in primary education management), or health services.

Key Findings Related to Stakeholders and Local Government in Port Vila

Key findings regarding stakeholders and the local government in Port Vila include, but are not limited to:

- The Local Government and the National Government are highly connected, despite the existence of decentralisation policies, which consider local governments (municipalities) as autonomous bodies. For instance, a portion of the PVMC budget (20%) comes from the contribution of the National Government.
- The governance structure for Greater Port Vila is complex, crossing two local government jurisdictions, with large areas of informal settlements, customary land-ownership arrangements, and a number of NGO organisations engaged in municipal service provision in different areas across the city.
- While many of the stakeholders evaluated are directly linked to the Municipality, the lack of an effective coordination among stakeholders acting at the local level has been identified as a main source of disruptions for sustainable management of funds allocated to implement several initiatives as well as redundancy of interventions and roles. There is a significant need for strengthened coordination among the stakeholders and reinforcement of communication.
- At the national level, a primary concern is around the lack of institutional, legal and financial frameworks to address urban affairs in general. In fact, there is not even a nationally accepted definition of "urban" in the context of a historic focus on rural development. This has meant there is very limited data on the urban context.
- There is an urgent need to coordinate the different stakeholders to ensure urban expansions are planned for and managed sustainably. The PVMC has made advances in their level of civic engagement but limited internal revenue and financial assistance from the central government hinder the effective delivery of services at the local level.
- There are limited financial and technical capacities at the local level for strategic infrastructure projects conducive to preventing and mitigating disaster risks.



Image 3: Port Vila, Vanuatu. Source: David Mark.

1.4. Analysis of Shocks Present in Port Vila

Port Vila is exposed to multiple *shocks*. Given the range of *shocks* to which the city is exposed, especially those referred to as 'natural' *shocks* (e.g. floods, tropical storms, heat waves, etc.), a prioritisation process was conducted in order to focus analytical efforts. This focused approach allowed for a greater depth of analysis for how certain *shocks* may exacerbate existing systemic vulnerabilities (i.e. *stresses*) both under present day conditions as well as in the future given the impacts generated by climate change and other contextual dynamics including, but not limited to, environmental degradation, demographics, policies, and governmental capacities.

Shocks prioritisation

In order to focus the analysis on the most serious *shocks* in Port Vila, defined in terms of the level of impacts on the city, a framework for prioritisation has been adopted. The framework is centred around people, assets and processes affected by these adverse events. As a part of this effort, prioritisation was based on the following four criteria:

- The magnitude of the impact that each *shock* has on the population, assets, and processes of the city.
- The recurrence of events and their impacts in the different areas of the city.
- Analysis of how different *shocks* act on the diverse elements and *components* of the urban system.
- Projections of climate change trends in Port Vila and how these trends may worsen the impacts of the identified *shocks*.

Considered of particular importance is the final criterion, which assesses the degree to which climate change may impact the severity and/or frequency of *shocks*. To aid in this evaluation, the city of Port Vila and the creation of its Resilience Profile with UN-Habitat became a case study for the project (GLORIOUS - GLObal useRs In the cOpernicUs climate change Service), developed by Lobelia for Isardsat, which has provided key information on climate change trends in the city derived from European satellite data.

Key findings from the Lobelia report are presented below but for further reading, refer to **Annex V: Key Messages on Climate Change**.

Expected impacts and vulnerabilities generated by climate change in Port Vila

Future climate change is expected to exacerbate the magnitude of some environmental impacts, which are already observed extensively in Port Vila under present-day climate conditions.

Highly vulnerable to intense rainfalls, under the projected increase in precipitation intensity during the wet season and cyclone season by 2100 under both moderate and high emission scenarios, the river flooding and flash-flooding risk in Port Vila is expected to maintain or be exacerbated. Cumulated with the effects of the projected changes in sea level rise expected around Vanuatu, with 13 cm (by 2030) to 48 cm (by 2090) under moderate emissions scenarios and 13 (by 2030) to 64 cm (by 2090) under high emission scenarios, the exposure to coastal flooding and coastal erosion is likely to increase significantly in the future.

Projected intense warming in the area of Port Vila over the 21st century is likely to threaten the health of marine ecosystems and coral reefs, which are highly sensitive to temperature variability, and which also serve as valuable local food and tourism resources.

The projected intense warming over the 21st century and the associated increasing frequencies and duration of hot weather events (e.g. tropical nights) is expected also to exacerbate the exposure to health-related hazards, particularly related to nutritional deficiencies, diarrheal and vector borne diseases, already prevalent in the target area under present-day climate conditions.

Based on the four criteria discussed above, the prioritised *shocks* identified for Port Vila, which fall under two distinct categories, are shown below:

Natural				Complex
Floods	Droughts	Cyclones	Earthquakes	Food and fuel supply crises
				

Prioritised shocks

The following paragraphs briefly describe the frequency of occurrence and some of the key causes, secondary shocks that can be triggered, and affected *Urban Elements* and *components* for each of the five priority shocks.

<p>Flood</p> 	<p>Since 1970, major flood events in Port Vila occurred in: 2000, 2001, 2007, 2008, 2015 and 2017. Floods in Port Vila are closely related to tropical cyclones and sudden sea level rise or wave actions (largely earthquake-induced tsunamis). Flood events lead to erosion of coastal areas and landslides. Moreover, the inadequate management of water systems and waste collection aggravates the risks of parasitic and/or vector-borne diseases such as malaria. Intense and frequent flooding also disrupts the provision of services and leads to the degradation of infrastructural and environmental assets.</p>	<p>Priority shock</p>
<p>Drought</p> 	<p>Vanuatu has faced serious drought periods due to intensified temperature and changing patterns in precipitation.¹ Dry conditions in Vanuatu are often associated with a strong El Niño (ENSO – El Niño Southern Oscillation). Severe drought periods in Vanuatu were recorded in 1982-1983, 1990-1995 (1993), 1997-1998, and 2015.^{2,3} Droughts trigger secondary shocks related to water supply, food supply, degradation and desertification of land, and nutritional diseases due to major impacts on agriculture. Therefore, droughts also have direct social and economic impacts on the urban system.</p>	<p>Priority shock</p>

¹ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

² Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

³ Secretariat of the Pacific Community (2012). Catalogue of Rivers for Pacific Islands.

<p>Cyclone</p> 	<p>As Port Vila is located within the South Pacific Convergence Zone and within the tropical cyclone belt, the city is particularly vulnerable to intense tropical storms. The frequency and intensity of these cyclones is anticipated to increase due to the effects of climate change.⁴ Cyclones affecting Port Vila were recorded in 1972 (TC Carlotta, TC Gail, TC June), 1987 (Uma), 1992 (TC Betsy, TC Fran), 1997 (TC Susan), 2001 (TC Paula, TC Sose), 2015 (TC Pam), and 2017 (TC Donna). Extremely destructive category 3-5 cyclones can cause serious damage to infrastructure and scatter debris across the city, limiting mobility and access to services.⁵ In some instances, such as during the initial days following TC Pam, certain areas had no access to electricity and fresh water supplies. In addition, severe damage to buildings can reduce access and safety, potentially limiting the operational capacity of government and hinder access to health, aid and other vital services.⁶</p>	<p>Priority shock</p>
<p>Earthquake</p> 	<p>Vanuatu lies on the boundary between the Australian and Pacific tectonic plates, forming part of the Pacific Ring of Fire. Vanuatu is extremely susceptible to earthquakes, with thousands occurring since 1973 when global earthquake monitoring began. Triggered secondary shocks include, most commonly, tsunamis, as well as flooding and landslides. In severe instances, a breakdown of supply chains, especially those ensuring the delivery of food, water, supplies, and fuel, may occur.</p>	<p>Priority shock</p>
<p>Food and Fuel Supply Crises</p> 	<p>The Global Food and Fuel Crisis of 2007, which was, in part, initiated by the global financial crisis, increased the cost of food and fuel in Vanuatu. While areas more dependent on traditional economic activities and subsistence agricultural practices were largely able to overcome the food crisis by growing more local foods, the crisis greatly affected transportation costs and energy prices in Port Vila. Secondary shocks that can be triggered by food or fuel supply crises include, most notably, decreased access to foods, which can lead to malnutrition. In addition, secondary shocks can include severe impacts on labour markets such as increased unemployment rates stemming from decreased economic activity and fiscal impacts such as inflationary dynamics and decreased fiscal expenditure flexibility as more resources are required to pay for needed fuel costs or subsidized food costs for the local population. In the case of Port Vila, given the integral role that the tourism and construction sectors play in the overall economy, changes in the global market could result in significant decreases in activity across these industries. For instance, a spike in fuel costs may deter travellers planning to visit Port Vila (both by plane and boat) as well as reduce the financial feasibility of key tourism offerings in and around Port Vila (e.g. boat or bus, air conditioning, etc.).</p>	<p>Priority shock</p>

⁴ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

⁵ OCHA (2015). Vanuatu: Severe Tropical Cyclone Pam Situation Report No. 1. Extracted here: www.reliefweb.int/disaster/tc-2015-000020-vut.

⁶ Government of Australia (1992). Tropical Storm Fran: Summary. Bureau of Meteorology. Can be extracted here: www.bom.gov.au/cyclone/history/fran.shtml

Key findings related to shocks in Port Vila

Given Vanuatu's location as one of the most areas prone to natural hazards, namely cyclones, earthquakes and tsunamis, apart from the growing risk of climate change effects, there is a significant presence by international development and humanitarian agencies working actively on building the country's capacity for reducing disaster risks. The national government serves as the major actor for planning, managing and coordinating DRR efforts at different levels, including the local level, and is actively partnering with a variety of regional and international actors in delivering its goals and objectives. Nonetheless, according to GFDRR, a number of challenges face the country in this regard, mainly weak institutional capacity, limited human resources and inadequate access to risk information.⁷

Efforts are disproportionately given to preparedness and emergency response activities for natural hazards, while relatively less has been made in terms of long-term mitigation measures, especially for non-natural hazards, such as those that are health-related or complex dynamics such as food and fuel supply crises.



Image 4: A boy and his father amid the debris of their home that was destroyed by Cyclone Pam in Port-Vila, Vanuatu, March 2015. Source: Dave Hunt/AP Images.

⁷ www.gfdr.org/en/vanuatu

1.5. Identification of Constraints Present in Port Vila

As defined in the glossary at the beginning of this report, *constraints* are defined herein as long-term contextual changes and pressures originating outside of the urban system that also undermine the city's capacity for sustainability and resilience. In other words, *constraints* represent identified forces, the origins of which are largely outside of the local government's control, which limit Port Vila's capacity to implement initiatives that reduce its vulnerability to the most recurrent shocks and impactful *stresses*. The following constraints were identified for Port Vila.

Geographic Isolation

As discussed in the previous section on shocks and illustrated in **Figure 6**, Port Vila, and Vanuatu more generally, is physically isolated. While there are no doubt certain benefits derived from this isolation, in combination with the city and countries relatively small size (as measured by population and economic activity), isolation ensures a continued dependence on foreign imported goods. Vila's dependence on imported fuel, high-value goods, food, and tourism leaves it vulnerable to economic reverberations in the global market.

As discussed regarding the identified priority *shock* of Fuel and Food Supply Crisis, such vulnerabilities are especially acute regarding global energy and staple food costs as Port Vila must rely both on international shipping, diesel fuel, and many *components* of daily dietary needs. Therefore, a regional or global economic crisis, or energy or food market volatilities, may cause extensive damage to the local Port Vila economy and those who depend upon it.

Climate Change

Not only is future climate change in and around Port Vila expected to exacerbate the magnitude of some environmental hazards, ongoing effects of climate change continue to have detrimental ecological impacts.

Sea-level rise and coastal erosion

While less susceptible to sea level rise than nearby Kiribati, sea-level rise in Vanuatu is exacerbated by the advent of climate change and hydro-meteorological hazards. Moreover, as Port Vila is located on a tectonically active area, vertical land movements cause the island of Efate to 'sink' at a rate of approximately 4 mm per year, thus roughly doubling sea-level rise impacts.

Ocean acidification

Ocean acidification and warming are immediate threats to Vanuatu's marine ecosystems and coral reefs, which underpin Port Vila's tourism economy, as well as serve as the source of a range of traditional food and material products. Ocean acidification directly damages coral reefs and fisheries, including the depletion of fish stocks. The coastal marine ecosystem surrounding the city includes extensive reef fisheries, providing an important local food source, feature for tourism, and location for resident recreation. The coastal marine ecosystem also supports the primary inter-island trade and transportation routes. Under both high and medium emissions scenarios evaluated as part of the Lobelia report (see **Annex 5. Key Messages on Climate Change** for further reading), coral reef health will reach marginal conditions at some point between 2020 and 2030. In addition to the threat represented by acidification, warming of the ocean increases the risk of coral bleaching events.

Vanuatu Legal Structure

There exists friction, gaps and overlaps within the country's legal framework, which are largely derived from the coexistence and integration of British common law, French civil law, and Ni-Vanuatu customary law. While it should be noted that very few significant conflicts seem to have occurred to date based on the coexistence of these legal frameworks, at times disputes have taken place based on the constitution's recognition that there should be a continuation of any British or French laws that were applied at the time of independence, with adaptations to such laws being made as necessary to bring them into conformity with the constitution. Furthermore, as the constitution was written in both English and French, and both texts carry equal legal standing, there exist areas of differing interpretation on existing statutes.

However, perhaps the most challenging coexistence stems from the integration of the official system (i.e. the legal basis which is established by the State) and established and recognised customary law. While the country's constitution, which was officially adopted in 1980, established a number of articles that include references to consulting customary law when no explicit constitutional law exists, in general, the role of customary law in the constitution is somewhat ambiguous.⁸

While the CRPP implementation process did not include extensive research into the interaction of constitutional law and customary law, when investigating land and property rights, the existence of these two legal structures seems to complicate efforts regarding data collection (particularly in the urban periphery of Port Vila) and agreement on jurisdiction. All land rights within the Port Vila municipality were acquired from customary ownership by the State following Vanuatu's Independence in 1980. Therefore, all land within Port Vila continues to be owned by the State and leased to private entities and individuals through long-term land leases, a process which is overseen by the Department of Lands. Outside of the municipal boundaries, however, wherein the majority of the rapidly growing peri-urban informal settlement is located, land remains under customary ownership structures. Further research should be conducted on how best to integrate the official and customary systems, especially as the urban area of Port Vila continues to grow outside of the municipal boundaries.

High Costs of Doing Business

Sustained growth in the economy for all sectors in Vanuatu is constrained by a very high cost structure. Electricity, telecommunications, indirect taxes and transport costs are all very high compared to other countries in the region. While wages are not high, productivity is low, resulting in very high effective labour costs. These high costs constrain local as well as foreign investment and affect tourism and manufacturing.

Integration of Constraints into Analysis

While *constraints* represent forces largely outside of the control of the local government, their consideration affects the understanding of current and future policy initiatives, prioritisation of shocks, identification of key *stresses*, and ultimately the design of *Recommended Actions for Resilience and Sustainability*. For instance, evaluating the potential efficacy of various economic development initiatives must consider the geographic context of Port Vila and how climate change may continue to impact potential livelihoods as well as the effective high cost of labour; so too must the crafting of initiatives intended to improve waste management in the city take into account limitations on recycling involving other countries given geographic isolation and instead should perhaps focus on encouraging circular economic activities; and initiating efforts to collect and manage land and property data must be aware of the underlying complexities of legal structures operating in the Greater Port Vila Area.

⁸ Forsyth, M. (2004). Beyond Case Law: Kastom and Courts in Vanuatu. *Victoria University of Wellington Law Review*, 35(2), 427. doi: 10.26686/vuwlr.v35i2.5640

1.6. Identification of Stresses

The identification of *stresses* and subsequent *Lines of Action* included a multifaceted process that incorporated findings related to Port Vila's *Urban Performance*, identified *shocks* and *constraints*, and analyses of the local government and key stakeholders operating in Port Vila. This section provides an overview of the process by which the resulting *Lines of Action* were developed.

Initial analysis of data derived through resilience indicators identified 10 primary *stresses*. This initial identification was conducted through a three-step process. First, a preliminary subset of approximately 25 potential *stresses* was selected based on contextual knowledge about Port Vila. Secondly, an in-depth exercise relying on a large matrix was conducted by the CRPP Port Vila team to create linkages between evaluable (i.e. benchmarkable) *supporting indicators* and the pre-selected *stresses* with the intention of qualitatively assessing the degree to which a given *supporting indicator* would inform the existence and severity of a given stress within the Port Vila context. The third step to the preliminary identification process was, using these qualitatively derived linkages, a quantitative calculation to determine of the 25 pre-selected *stresses*, which ten *stresses* were to be considered priorities based on the data findings and linkages exercise (step two).⁹

The 10 *stresses* resulting from the three-step process described above were then presented to a group of key stakeholders in a workshop held in Port Vila in April 2019. Using the topics reflected in the data-derived *stresses*, a series of participatory exercises revealed both additional thematic areas of concern in the city, as well as bolstered those thematic areas previously identified through the CRPP-led matrix analysis with a more detailed assessment of existing and planned political initiatives. This refinement additionally incorporated discussion of the capacities, vulnerabilities and competencies of key stakeholders including the PVMC, and other trends or contextual factors that may not have been adequately captured through quantitative data analysis. The first major result of this workshop was therefore a refined prioritisation of *stresses* that incorporated a range of both quantitative and qualitative factors, ensuring each selected stress contained concrete evidential justification as well as stakeholder support and understanding. The resultant group of *stresses* included eight priorities. These priority *stresses* are presented below along with selected key *supporting indicators* and *related questions* which exemplify their selection.



Image 5: Discussion During April 2019 Workshop in Port Vila.

⁹ It is important to note that this linking process was developed specifically for the Port Vila context and therefore attempted to capture some of the complexities of the Port Vila urban system (e.g. rural to urban migration, household composition, the prevalence of non-governmental organisations in the city, etc).

Lack of economic opportunities (under/unemployment, inadequate skills and capacities, workforce development)

The stress “Lack of economic opportunities (under/unemployment, inadequate skills and capacities, workforce development)” was identified in Port Vila. Key topics informing this identification include:

- A high ‘Not in Education, Employment or Training’ (NEET) rate
- Low business density (number of businesses established per square kilometre)
- Precariousness in the labour market; high level of informal work
- Limited worker training and retraining programs available for city inhabitants

Lack of investment in / inadequate management of solid waste and sanitation

The stress “Lack of investment in / inadequate management of solid waste and sanitation” was identified in Port Vila. Key topics informing this identification include:

- Low percentage of the population with solid waste collection
- Lack of control mechanisms: maintenance and monitoring of waste collection and treatment
- Degradation of soil due to contamination
- Proliferation of human settlements in risk areas
- Basic services for the collection of unsuitable solid waste: lack of information and participatory processes

Expansion of informal settlements (lack of tenure, legal rights, access to services)

The stress “Expansion of informal settlements (lack of tenure, legal rights, access to services)” was identified in Port Vila. Key topics informing this identification include:

- Percentage of informal land under tenure formalisation
- Lack of pro-poor land administration practiced in the city
- Low percentage of population with access to sanitation services
- High percentage of urban footprint in hazardous location
- High percentage of city area considered informal

Conflict of jurisdictions

The stress “Conflict of jurisdictions” is present in Port Vila. Key topics informing this identification include:

- Is the city conducting awareness-raising campaigns and projects regarding the use and ownership of land?
- Is the city implementing water demand management strategies?

Lack of gender representation in decision making and implementation

The stress "Lack of gender representation in decision making and implementation" is present in Port Vila. Key topics informing this identification include:

- Limited/no local government collection of citizens' feedback
- Limited access to family planning and reproductive healthcare services
- Lack of affordability of public transport
- High proportion of young women not in education, employment or training (NEETs)

Limited enforcement of rules and regulations

The stress "Limited enforcement of rules and regulations" was identified in Port Vila. Key topics informing this identification include:

- Percentage of critical facilities in hazardous locations
- Percentage of key buildings in hazardous locations
- Percentage of population with regular municipal solid waste collection service (at least once a week)
- Percentage of inhabitants paying land/property tax

No comprehensive planning

The stress "No comprehensive planning" is present in Port Vila. Key topics informing this identification include:

- High percentage of urban footprint in hazardous location
- Low percentage of urban footprint dedicated to open spaces
- High percentage of city area considered informal
- Limited proportion of inhabitants paying land/property tax
- Lack of available information management tools

Lack of schemes for affordable housing

The stress "Lack of schemes for affordable housing" is present in Port Vila. Key topics informing this identification include:

- Low percentage of informal land tenure formalisation
- Lack of pro-poor land administration
- Low percentage of city area with complete land administration data

1.7. Formulation of Lines of Action

The second key outcome of the April 2019 workshop was the development of three thematic areas intended to capture categorical overlaps between the eight priority *stresses* as well as take into consideration basic political, cultural, and economic considerations regarding implementation of potential actions. More comprehensive analyses of existing and planned policies, plans and initiatives, as well as economic implementation, was conducted later on in the CRPT implementation process and will be discussed in greater detail in **Chapter 2: Recommended Actions for Resilience and Sustainability** and **Appendix 1. Cost-Benefit Analysis Assessment of Port Vila's Recommended Actions for Resilience and Sustainability**, respectively. These thematic areas, or *Lines of Action*, seek to link priority *stresses* with qualitative and contextual knowledge derived from key stakeholders to ensure the consideration of urban performance data as well as operational realities within the PVMC and in the city of Port Vila. In other words, *Lines of Action* serve as the bridge between the *stresses* identification and proposed concrete actions -- a mechanism to connect the eight priority *stresses* and more dynamic information regarding policies, stakeholders, and the impacts of climate change, and serve as the thematic lenses through which *Recommended Actions for Resilience and Sustainability* are developed.

The three *Lines of Action*, shown below, serve as the basis from which *Recommended Actions for Resilience and Sustainability* are developed:



Figure 10: Lines of Action.



Image 6: Port Vila, Vanuatu. Source: Adli Wahid.



Chapter 2 Recommended Actions for Resilience and Sustainability

Chapter 2

Recommended Actions for Resilience and Sustainability

Recommended Actions for Resilience and Sustainability in Port Vila are based on a multifaceted data collection and analytical process combining quantitative and qualitative approaches, incorporating information on the Port Vila's unique context; the city's *Urban Performance* – that is the collection, analysis, and prioritisation of resilience-related *supporting indicators* and *related questions* which provide a measurable, evidentiary basis for the identification of key *stresses*; the identification and prioritisation of *shocks* and *constraints* present in Port Vila that must be considered when proposing resilience-building actions; and the mapping and assessment of the composition of the Port Vila Municipal Council as well as other key stakeholders from other governmental entities, the private sector, and non-governmental organisations.

In addition, in developing *Recommended Actions for Resilience and Sustainability*, an in-depth evaluation of proposed or ongoing local initiatives was conducted in order to better understand the degree to which *stresses*, *shocks* and *constraints* would be affected - improved, worsened, or remain the same – by the application of policies, programs, initiatives and/or projects. In other words, such identification provides a basis from which *Recommended Actions for Resilience and Sustainability* could be crafted and allow for a more nuanced understanding of Port Vila's potential trajectory (i.e. through planning documents) as well as the political feasibility of pursuing different types of actions.

Proposed actions incorporate the extent to which climate change will impact the severity and frequency of *shocks* and exacerbate existing *stresses*. Furthermore, the formation of actions includes an identification of key stakeholders and stakeholder trends to better understand the interaction between the urban system -- and the local government in particular -- and foreign entities such as governments and international non-governmental organisations. Lastly, each proposed action integrates findings from a preliminary cost-benefit analysis (see **Appendix 1. Cost Benefit Analysis of Recommended Actions for Resilience for the full analysis**) to better inform decision-makers about the relative feasibility of, and potential benefits that could be generated from, the implementation of a given action.

Chapter Structure

Following a short summary of the process by which *Lines of Action* were developed and high-level key findings for each *Line*, **Chapter 2** is primarily structured by *Line of Action*, presenting in a systematic manner the research and analysis that informed the selection and design of the *Recommended Actions for Resilience and Sustainability*. For each *Line of Action*, an explanation is presented regarding 1) its alignment with international frameworks and agendas, 2) the key linkages with identified *shocks* and *stresses*, 3) relevant gaps in, or availability of, data (particularly spatial data), 4) the existence of key documents, 5) an analysis of relevant stakeholders, 6) a comprehensive evaluation of relevant policies, plans and initiatives, and 7) key findings addressing the *Line of Action* generally and when applicable, specific analyses of stakeholders and policies, plans and initiatives.

Summary of Development Process

As discussed in greater detail in the previous chapter, the process informing the development of *Recommended Actions for Resilience and Sustainability* was multifaceted and interconnected. While at times presented chronologically or linearly in its logic, it should be noted that the nature of the information gathering process and the complexity of the analytical process meant that, in practice, analytical efforts were conducted in an overlapping manner. This interconnected process included an analysis of Port Vila's *Urban Performance*, informed by over 1,700 lines of data across eight thematic areas -- *Urban Elements* -- comprising the urban system, which each include multiple sub-areas. Analysis of the data was undertaken in order to identify the key *stresses* faced in Port Vila. A preliminary list of *stresses*

was identified. A workshop was then held to validate the list and cross-reference it with a subsequent list developed by PVMC and key stakeholders. The two-day process resulted in a single list of prioritised *stresses*, derived collaboratively, that reflect both quantitative and qualitative processes.

At the end of the workshop, three thematic areas were identified which encapsulated a combination of the priority *stresses*, analysis of the extent to which the local government and stakeholders are operating within particular areas, and the preliminary identification of key *shocks* and *constraints* that may affect the implementation of potential actions (e.g. the identification of current political priorities and the existence of stakeholders currently operating in the space). These *Lines of Action* included: solid waste and sanitation management, youth employment and economic development, and land and property data collection and management and became the basis for designing *Recommended Actions for Resilience and Sustainability*.

A second participatory workshop was then held to find entry points into each *Line of Action*, each of which is complex in its own right and interlinked with many other facets of urban life. The second workshop (RAR-S Workshop) focused on the development of holistic approaches with tangible, practical and actionable ideas that considered the strategic, operational, programmatic, financial, legal and policy aspects of each *Line of Action*. By the end of the workshop, PVMC and its key stakeholders had developed the basis for the *Recommended Actions for Resilience and Sustainability*.

In addition to being directly informed by priority *stresses*, the development of each *Line of Action* also relied upon the identification of links to global frameworks and agendas, the existence of *shocks* and how they may be exacerbated by climate change, as well as gaps in available data. When available, data from spatial and GIS sources were incorporated as were data from previous city or neighbourhood-level studies. A stakeholder analysis was also undertaken in order to understand the varying degrees of responsibility, interest, power and resources of the urban actors engaged with each *Line of Action*, including the specific role of the local government. Finally, key policies, plans and initiatives were identified and analysed in order to better understand the legal and policy aspects of each *Line of Action* and the current activity landscape that exists, including risk reduction measures.

2.1. Line of Action 1: Land and Property Data Collection and Management

Comprehensive data about land and property in Port Vila is not presently available. Reliable records about land and property can significantly increase local government revenue and the quality and types of services it provides by enabling value-based property taxes. With good land and property records, local governments such as PVMC can implement mass valuation systems for equitable and efficient property taxes, increasing the financing and implementation of public infrastructure, and as a direct effect, ultimately increase public safety, public health and access to markets and trade. According to the World Bank, up-to-date land records is underutilised by local governments in low-income countries, equating to an estimated 0.6 percent of GDP versus an estimated 2.2 percent in higher-income countries.²

Disaster recovery is also intertwined with having accurate and reliable data about land and property. Formal, secure and publicly available systems for holding the data makes land and property owners and leasees less vulnerable to eviction and loss of livelihoods. Moreover, better data on land and property may assist PVMC to understand the nature and extent of informality within its official municipal boundary and as a result, better provide services and disaster risk reduction support. A recent UN-Habitat and RMIT University study found that “Only 20% of informally settled households lie within the municipal boundary, with an estimated total population of 2,873. Although land tenure arrangements across these settlements are ‘informal’, many of them are long-standing, with settlements such as Blacksands established as early as the 1960s”.³

Greater awareness about the formal boundary of Port Vila may also provide substantive benefits to PVMC. Presently, different stakeholders use different boundaries when profiling the nation’s capital. The city’s statistical boundaries used in the 2009 National Census are “significantly larger than the municipal boundaries that are legislated in both the original Municipalities Act [CAP 126] and the more recent Port Vila Municipality (Composition of Council and Wards) Amendment (Order No. 66 of 2013)”.⁴

The World Bank notes that recording land and property data has become more feasible, affordable and accessible than ever before through crowdsourcing, new geospatial technologies, digitisation and automation.⁵ Private sector companies such as Land Logic, a property data and valuation firm in Port Vila, advertise an “unmatched property database” called Property Intel, suggesting data can be collected and managed electronically in Port Vila.⁶ The World Bank suggests that where data is recorded in a limited manner, it may be due to “excessive legal and procedural requirements, lack of standardization, conservative professions, change resistance, and restrictive policies”.⁷

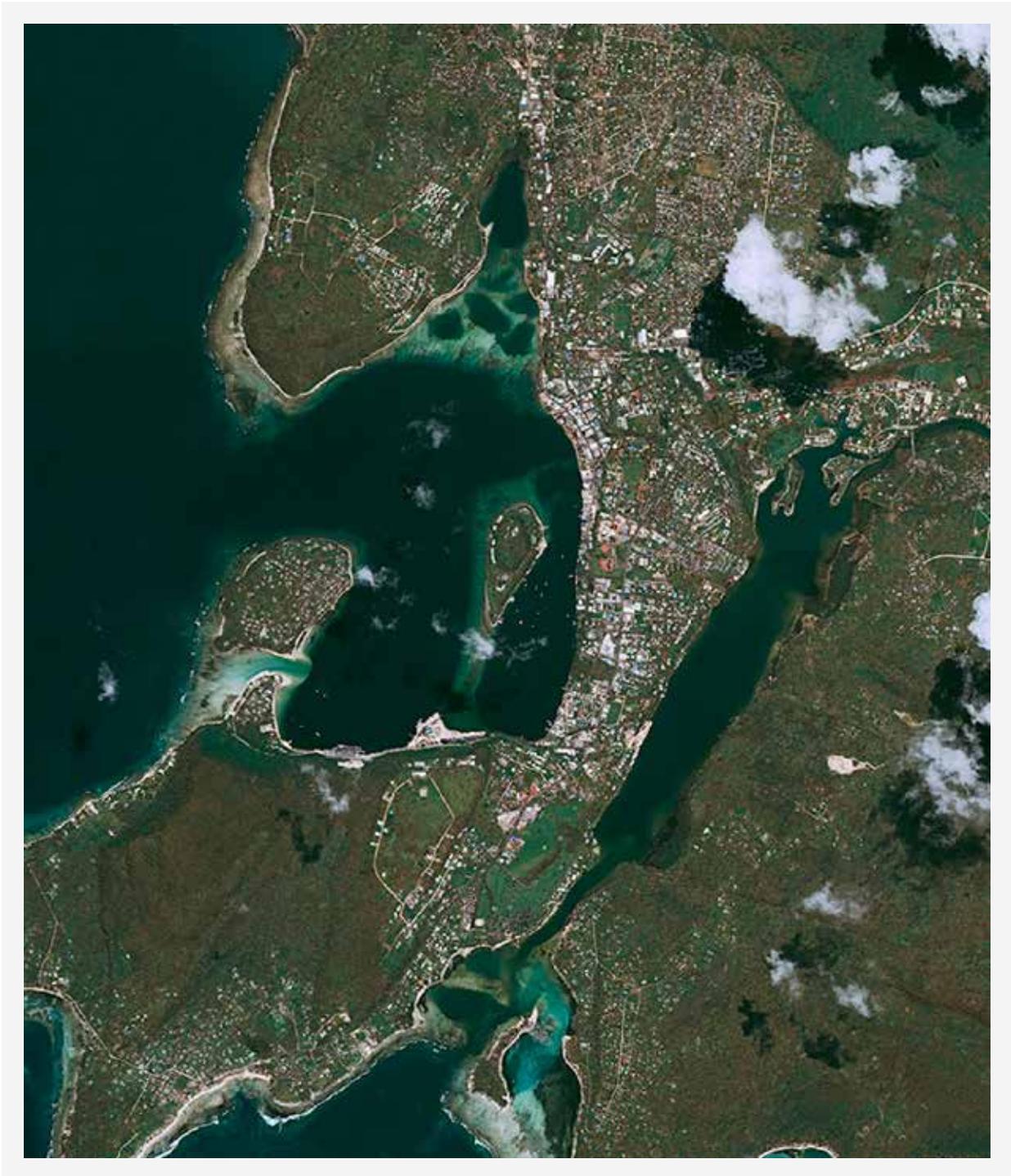


Figure 11: Pléiades Satellite Image - Port-Vila, Vanuatu. Source: Airbus Defence and Space.

Links to Global Frameworks and Agendas

The Sustainable Development Goals (SDGs) feature land and property rights in SDG 1, 2, 5, 11 and 15. The need for more accurate and reliable record keeping is essential to achieving all goals related to land and property. For instance, goals 1, 2, 5 and 15 refer to issues around access to land, quality of land, ownership and control over land and property for both sexes, secure tenure rights to land, recognised documentation of land and property and access to adequate housing. Goal 11, addresses the sustainability of cities and communities, highlighting issues around land consumption rates to population growth rates and access to safe, inclusive and accessible green and public spaces for people. Global initiatives such as the Global Property Rights Index (PRIndex⁸) by the Overseas Development Initiative and Land Alliance have developed high quality surveys that can be rolled out in short time frames at a low cost through Gallup's Findyr Network⁹, producing high integrity data that is robust.

Land, the management of it and the data related to it, is a central tenant to achieving key aspects of the New Urban Agenda. Better data on land and property assists with the achievements of four commitments recommend by United Nations Member States in a briefing note by UN-Habitat and the Global Land Tool Network for policy makers to achieve the goals of the New Urban Agenda. The commitments are "1. Ensure tenure security for all: 2. Ensure sustainable land use 3. Generate land-based revenues for the benefit of all 4. Enable responsible land governance".¹⁰

Lastly, the Paris Agreement on climate change, specifically article 5, emphasises the importance of climate change mitigation through land use activities. Recording data about land use in cities can contribute to finding means for climate change mitigation.

Links to Identified Shocks, Stresses and Constraints

Building resilience to natural hazards and climate change is among Vanuatu's most important development challenges. According to the World Risk Report, Vanuatu is ranked as the single most disaster-prone country in the world¹¹, with Port Vila exposed to a number of natural hazards including tsunamis, earthquakes, flooding and drought. One study of Greater Port Vila found that 85 percent of the city's footprint is exposed to moderate levels of risk from earthquakes and wind, while 15 percent is exposed to very high levels of risk.¹² A high degree of disaster preparedness is pertinent to building resilience, to saving lives, supporting infrastructure and jobs and maintaining the development gains that have been made over the past several decades. Mitigation actions related to land and property data that can reduce the impact of a naturally triggered disaster on the inhabitants and infrastructure within Port Vila include participatory hazard risk mapping, land rights awareness activities, and protection of public administration data and records. Accurate and up-to-date land and property data can be used to decide upon the location of evacuation centres, emergency shelter areas and transitional shelter settlements and other housing related activities that take place in the immediate onset of a response to a disaster.

A lack of land and property data contributes to a number of other urban *stresses*, namely a lack of comprehensive planning, zoning and land use controls. More comprehensive and up-to-date land and property data can support more effective development planning efforts and disaster mitigation activities. Barriers to public participation in decision-making around development planning can further compound the *stresses* listed above, especially in regard to the participation of informal settlements in disaster prone locations where people do not have legal land records. A gendered approach to participation in land and property data collection is essential in Port Vila as men have traditionally made decisions about land reflecting a long, patriarchal history. Finally, academic studies indicate that the inadequate enforcement of rules and regulations regarding land and property has resulted in exploitation and land grabs within Port Vila.¹³ Linked to that are observations that the quality of housing in Port Vila is variable and difficult to assess as building standards are largely self-regulated and unenforced.¹⁴

Data Gaps

The following gaps have been identified in relation to land and property data collection:

1. Spatial data for Port Vila is out-dated
2. Valuation roll for Port Vila is out-dated
3. Absence of a zoning and control plan
4. Current official boundary for Port Vila is not used by some national ministries, and during census data collection
5. Inconsistent technical processes for collecting property tax revenue
6. Ineffective measures for enforcing payment of property tax
7. Limited to no accessibility between relevant databases hosted by the National Lands Department (DoL) and PVMC. Seven databases were identified as hosting information that may be relevant to both levels of government, requiring significant changes to access and coordination. The databases include mapping databases, a database of leases, the Document Tracking System, a Finance database of homeowners, PVMC building permits and a PVMC property tax database.
8. Public access to relevant databases is also a difficult, encumbered process that can be improved upon.

Spatial Mapping / GIS

There exists a lack of reliable spatial data for the Port Vila municipal area and surrounding region. While GIS layers were provided to UN-Habitat by the PVMC, the data available is both limited and often significantly outdated. Improved data collection and management processes, including regarding spatial data, would greatly benefit the PVMC in designing, implementing and managing policy initiatives.

Below are two basic maps depicting the legal PVMC boundary and its ward districts are presented. Both maps were prepared by the CRPP team and rely on a combination of GIS layers provided by the PVMC and other publicly available data.



Figure 12: Map of PVMC Formal Boundary.

Figure 13: Map of Ward Boundaries.



Additional Relevant Studies

Two additional studies provide insight into land and property data collection within Port Vila.

A. Vanuatu National Leasing Profile: A Preliminary Analysis¹⁵ by the World Bank

The document states it is the “first comprehensive attempt to document nation-wide leasing activities in Vanuatu and highlights the importance of maintaining a uniform and reliable database of land lease registration that could inform land use planning decisions”.¹⁶ The report indicates that urban areas such as Port Vila are comprised of government landholding leases. The report also asserts that data quality could be improved in terms of completeness and centralization. It makes the five following recommendations about leasing data that requires collection:

1. “Distinguishing leases that have been surveyed from those that have been registered
2. Improving data recording quality, particularly for area, rents, premiums, lease term, year registered, and lease class
3. Collecting data on foreign versus local lease holding as part of the leasing data
4. Creating a mortgage register to determine the extent to which custom landholders are leasing land
5. Monitoring the location of leased land—for example, whether it is coastal or prime agricultural land”¹⁷

B. Greater Port Vila Climate Vulnerability Assessment by RMIT University's Climate Change Adaptation Programme and UN-Habitat's Cities and Climate Change Initiative

The study provides baseline data regarding the potential *shocks* and *stresses* that may impact Greater Port Vila. It provides a short and long-term analysis of social, economic and environmental factors that influence Greater Port Vila's vulnerability and resilience. The study focuses on the Malapoa-Tagabe Ward, Anabrou-Melcoffee Ward, Freswota-Tassiriki Ward, Central Ward and the Southern Ward. Key findings about property and land across in Port Vila and the greater Port Vila area (understood here as the area within provincial boundaries) include:

1. Variable quality of housing regulated by 1989 building standards that are un-enforced resulting in houses that continue to receive heavy damage during a disaster
2. The Building Code was updated with Asian Development Bank (ADB) assistance in 2000 but currently operates as a guideline due to a lack of finalisation in legislation
3. Informal settlements inside and outside of Port Vila's municipal boundaries lack formal classification partially due to the different informal tenure and rental arrangements. The report found that "census self-classification is restricted to those household respondents who identify themselves as 'owning' their housing; thus excluding households who rent, as well as those who might classify themselves as not owning the land in a formal sense from the sub-question relating to households who 'occupy with informal arrangements'".¹⁹ The report therefore concludes that "As a result, 54% of households were excluded from land tenure classification statistics across Greater Port Vila, which limits the accuracy of data"²⁰ about land and property ownership.
4. In 2003 a large proportion of Port Vila's building stock was recorded as having high sensitivity to climate-related and geo-hazards with only 5.3 percent deemed "well-engineered structures".²¹ The table below correlates building type with the quantity of buildings and estimated value as cited in UN-Habitat and RMIT's Greater Port Vila Climate Vulnerability Assessment.²²

SOPAC Building Class & Description Stock		Quantity of Building Stock	Est. Value (USD)
A	Well-engineered structures (schools, hospitals, etc.)	254 (5.3%)	\$32.0 million
B	Concrete or concrete block structures – moderate quality construction	2822 (58.8%)	\$298.5 million
C	Wooden bungalows (poor wind, earthquake provisions)	1629 (33.9%)	\$105.1 million
D	Poor quality structures (shacks and sheds)	98 (2%)	\$3.3 million

Table 2: Port Vila Building Stock Analysis.

Source: Bettencourt and Dunn, 2003 cited in Trundle and McEvoy, 2015.²³

Stakeholder Analysis

At a workshop in Port Vila, stakeholder analysis was undertaken in a two-step process. Firstly, a list of key stakeholders relevant to land and property data was developed. Secondly, a mapping was conducted to measure those stakeholders who have power and influence through ranking each stakeholder's level of interest and power as low, medium or high, as shown in **image 7** below.



Image 7: A photo of Power/Influence Exercise for Stakeholders Active in Land and Property Data Collection and Management. Source: *Recommended Actions for Resilience and Sustainability Workshop* in August 2019. CRPP 2019.

Mapping of power, interest, and resources of active stakeholders in land and property data collection and management

The photo above maps a perceived understanding of power, interest and resources of stakeholders active within land and property data related activities in Port Vila. The mapping concludes the following:

High power and high interest:	The stakeholders with the highest degree of perceived power and interest were government actors – the Department of Local Authorities (DLA), the Lands Registry Section and Lands Survey Section within the Department of Land and PVMC.
High power and medium interest:	The Department of Finance was also perceived to hold a high degree of power but with medium interest.
Medium power and high interest:	Actors with perceived medium degree of power and a high degree of interest include ADB, New Zealand's Ministry of Foreign Affairs and Trade (MFAT), Australia's Department of Foreign Affairs and Trade (DFAT) and the World Bank.
Medium power, medium interest:	Actors with perceived medium levels of power and interest include the Department of Climate Change and the Department of Environmental Protection and Conservation (DEPC).
Medium power, low interest:	The Vanuatu Office of the Government Chief Information Officer (OGCIO) was thought to have a medium level of power but a low level of interest in land and property data.
Low power and high interest:	Land Logic was thought to be an actor with a low degree of power but a high interest.
Low power and medium interest:	Other actors with a perceived low degree of power and medium degree of interest were thought to be the Vanuatu Cultural Centre and UNELCO.

In summary, a small number of stakeholders engage with data collection on land and property in Port Vila, consisting mostly of government departments (both national and municipal) and private sector actors. In regard to resources, stakeholders with perceived high levels of resources include the DLA, PVMC and the DoL, Land Registry Section and Lands Survey Section, all of whom have direct responsibility for collecting data related to land and property. Other stakeholders such as Land Logic, a private sector company, is thought to have high resources and therefore potentially worth engaging further.

Below is a table that transposes the information from the photograph above indicating degrees of power/influence from low, medium to high and degrees of interest, also from low, medium to high. An asterisk indicates actors with perceived resources (skills, finance or experience). This table transposes the information from the photograph above indicating degrees of power/influence from low, medium to high and degrees of interest, also from low, medium to high.

Power/ Influence	High		Department of Finance	DLA
				PVMC
				Department of Land, Registry and Survey
	Medium	OGCIO	DEPC	ADB
				World Bank
			Department of Climate Change	MFAT
				DFAT
	Low		Cultural	Land logic
			Centre	
			UNELCO	
	Low	Medium	High	
Interest				

Table 3: Power/Interest Mapping: Land and Property Data Collection and Management.

Specific role of local government

PVMC is responsible for collecting land and property data within the municipal boundaries. As noted in *Vanuatu 2030: The People’s Plan*, local authorities and municipal planning authorities are also responsible for enacting and enforcing land use planning laws and regulations.



Image 8: Port-Vila, Shefa, Vanuatu. Source: eGuide Travel.

Policies, Plans and Initiatives (PPI) Analysis

The following seven policies, plans and/or initiatives have been selected as key to informing activities related to land and property data collection. A summary of each is provided below.

1 The Mama Graon – Vanuatu Land Program (MGP)^{25, 26}

The Mama Graon – Vanuatu Land Program (MGP), received AUD\$20.3 million in funding from the Australia and New Zealand governments to support “implementation of the Vanuatu Land Sector Framework (VLSF), a strategy document developed in response to the 2006 National Land Summit”.²⁷ The five-year project started in January 2011. The goal of the programme was described in a final evaluation report as “all Vanuatu people benefit from the equitable and sustainable development of their land, while securing the heritage of future generations. Its purpose is to improve decision making, make it more transparent, and improve land management procedures and practices, and in doing so minimise the potential for conflict”.²⁸ Components from the report that directly relate to land issues in Port Vila include:

Component 1:

- Proposed outcome: Establish an effective land lease and development planning, assessment, permitting and enforcement service.
- Output: urban zoning activities for Port Vila. This work was to be done by a Thematic Working Group (TWG) of the VLGC. The TWG has not reported on the outcomes of this activity”.²⁹

Component 2:

- “Proposed outcome: Deliver a national land awareness, knowledge and gender mainstreaming campaign
- Output: The Communication Strategy is most likely reaching people in the urban area of Port Vila”.³⁰

Component 3:

- “Proposed outcome: Valuation services
- Output: Four valuation data collectors were contracted to collect property data for the estimated 4,300 properties in the Port Vila Municipality. Field data collection was undertaken using digital tablets with data downloaded in the office. This work is complete. Valuation staff has completed preparation of a draft Valuation Zone Map and Rate Tables for Port Vila. Although a Valuation Zone Map and Rate Tables have been prepared for Port Vila there needs to be government commitment to implement. Current indications are that there is a reluctance to implement”.³¹

2 Vanuatu Land Sector Framework 2009-2018³²

Vanuatu’s Land Sector Framework was authorised by the Ministry of Lands and Natural Resources through funding from DFAT (known as AusAid at the time of the framework’s development). While no part of the framework specifically mentions Port Vila, it does recommend that land sector reform activities (including data collection activities) within cities should take into account the framework and related land reform activities spanning 2009-2018, which were designed to guide government, the private sector and civil society. One of the many goals within the framework was to improve coordination within the land sector and stakeholders’ ability to deliver land services. The key stakeholders listed for improving coordination included: “MoL [Ministry of Lands and Natural Resources), Ministry of Internal Affairs (MoIA), Ministry of Agriculture (MoA), Main civil society actors (Malvatumauri National Council of Chiefs (MNCC) and Vanuatu Kaljoral Senta (VKS)), DSPAC [Department of Strategic Policy, Planning and Aid Coordination], Private Sector, Local authorities (Provincial and Municipal Governments), Office of the Valuer General (VG), Professional Associations (e.g. Chamber of Commerce)”.³³

3

The Port Vila Urban Development Project³⁴

The Port Vila Urban Development Project, executed by the Ministry of Finance and Economic Management, was funded by the ADB with the goal of contributing to sustainable urban development. The project outcome was to improve the infrastructure and governance mechanisms through four outputs. While not directly related to land, these outputs will have relied upon information about land and property data and may be accessible through direct contact with the donors or PVMC.

1. "The Government has improved the road network and drainage system in greater Port Vila.
2. The Government has improved the sanitation system in greater Port Vila.
3. Central area and settlement communities use improved hygiene facilities.
4. Government agencies and community user organisations have the capacity to effectively and efficiently manage sanitation, roads, and drainage systems".³⁵

4

The Vanuatu Preparedness Package³⁶

The Vanuatu Preparedness Package was developed by the National Disaster Management Office (NDMO) in Vanuatu and the Pacific Humanitarian Team (PHT) with an aim to improve collaboration between international and national actors. With Port Vila as the national's capital and primary centre for economic activity, national levels of preparedness are interdependent with municipal levels of mitigation, prevention, partnerships and coordination activities.

5

Vanuatu National Land Use Planning and Zoning Policy³⁷

Currently, Vanuatu does not have a National Urban Policy. The Vanuatu National Land Use Planning and Zoning Policy recommends the re-establishment of an Urban Affairs Committee. Should this recommendation come to fruition, the Urban Affairs Committee would be important to coordinate with as municipal focused activities related to land and property data move forward. The Vanuatu National Land Use Planning and Zoning Policy outlines five policy directives that are especially pertinent to activities related to land activities within Port Vila. These are:

1. Development of a National Urban Policy
2. Stakeholder consultation protocols in relation to land-use planning that include women, youth, low-income groups, churches, the private sector, kastom governance representatives where appropriate and minorities
3. Require urban land use decision-making be based on comprehensive land use planning processes (either through legislation or regulation) and provide appropriate monitoring and enforcement and mechanisms such as development applications and zoning and development controls document
4. Reflect population growth and demographic projections in formal urban land use planning and expansion processes. Consider inclusion of transport, housing, amenities, open spaces, recreational areas, infrastructure, public services and physical planning areas and zones
5. Take care to formally incorporate climate change projections and urban vulnerability assessments

The Vanuatu Climate Change and Disaster Risk Reduction Policy advocates for the collection of comprehensive land and property data in order to inform land use and development planning, among other things, in both urban and rural areas. The report states: “Up-to-date, accurate climate change and disaster risk reduction data and technical analysis of that data are essential for the Government of Vanuatu and relevant parties to make informed decisions for development planning, targeted community awareness, preparedness and response”.³⁹ Furthermore, it recommends, “establishing a central database to collect, store and enable access to relevant data, ideally in a publicly accessible format on the National Advisory Board on Climate Change and Disaster Risk Reduction (NAB) portal”.⁴⁰

Vanuatu’s development aspirations and overarching policy framework directly refers to land and property in its environmental goal to “Strengthen local authorities and municipal planning authorities to enact and enforce land use planning laws and regulations”.⁴²

Key Findings for Line of Action 1: Land and Property Data Collection and Management

General key findings

While there are a number of opportunities that can be identified regarding land and data, they broadly fall into three categories.

1. There is a strong demand for comprehensive, accurate and up-to-date land and property data for Port Vila. A lack of publicly available and/or up to date spatial data is a strong indicator of the need to improve data collection and management processes.
2. Data management could be dramatically improved through better coordination between IT systems and land services actors (national and local government as well as the private sector).
3. Better awareness about Port Vila's municipal boundaries has the potential to help communities identify which government authority – national, provincial or municipal – is responsible for the provision of public services. Public awareness and communication about the official boundaries of Port Vila can assist communities to know if they are under the responsibility of PVMC or Shefa Province. Additionally, better public awareness about ward boundaries can assist people to identify the ward in which they belong to and the Ward Secretary with whom they should speak to about the provision of public services, or if indeed, their service provision falls within the scope of Shefa Province. Greater clarity about ward boundaries may even improve the efficacy of official redress mechanisms by placing due pressure on government agencies responsible for providing absent or ineffective services.

Key findings from analyses of stakeholders and policies, plans and initiatives

1. Engaging with land management procedures and practices is complex, as demonstrated through mixed results achieved in projects such as Mama Graon. Moreover, decision-making related to land and property issues has not always been transparent or accountable. Collecting basic data related to land and property within each of the five wards in Port Vila may be a first step to improving governance related to land and property. A ward level survey has been drafted and is currently under review by PVMC; adding to the survey may provide a logical entry point to more comprehensive land and property data collection, acknowledging the narrow window for adding to the current draft.
2. Coordination of land data remains a nebulous issue as highlighted in the 2009-2018 Land Sector Framework. Activities needed to address gaps in coordination include a focus on the collection, management and accessibility of data.
3. Accurate, up-to-date land and property data has the potential to inform a more sustainable and resilient development trajectory for Port Vila through improving land use planning and expansion processes, contributing to the identification of climate and disaster risks and community awareness, preparedness and response activities in addition to the potential development of a national urban policy, should it come to fruition.

2.2. Line of Action 2: Solid Waste and Sanitation Management

The rapid population growth currently facing Port Vila, in combination with greater overall economic development, has the potential to result in acute waste management problems as the quantities and types of waste materials increases.⁴³ Moreover, as the tourism industry continues to grow, additional measures for managing waste from cruise ships will be required. A 2016 report by the Vanuatu national government identified the greatest challenges for managing urban waste in Vanuatu as limited human resources (including a lack of trained practitioners and subject matter experts and institutions that offer training) and limited financial capacity.⁴⁴

With waste management known to be a chronic key infrastructure deficiency within Port Vila, a number of significant investments are now taking place to address the growing needs, including an upgrade of the Bouffa Landfill into a semi-aerobic landfill, an increase in partial waste collection services in Port Vila Municipality, and circular economy initiatives such as market composting and aluminium can recycling.⁴⁵ A Japan International Cooperation Agency (JICA) study of household waste in Port Vila indicates that the majority of waste is organic, followed by plastic. Moreover, the same study produced data about the quantities and types of waste generated, which may better assist PVMC to allocate budget, identify relevant technologies, and invest in integrated waste management methods.⁴⁶



Image 9: Bouffa dump. Source: Harrison Selmen.

Links to Global Frameworks and Agendas

Solid waste and sanitation management is a priority within a number of global frameworks and agendas. For instance, a number of SDGs focus on solid waste management such as 6, which seeks to achieve clean water and sanitation. Other SDGs are reliant upon effective solid waste management as one of the many pathways to achieving the goals. This is the case for SDG 11 on making cities and communities sustainable, SDG 14 on reducing plastic in the ocean, SDG 15 on reducing pollution on land as well as SDG 3 on health.

Within the 15 pillars of the New Urban Agenda, waste management falls within Pillar 7 on Urban Basic Services, particularly through article 74 on sound waste management, but also through various other articles such as article 55 committing to inclusive and quality public services and article 77 on minimising waste.

Lastly, the Sendai Framework for Disaster Risk Reduction is also critical to consider when developing more effective waste management in towns and cities. All four outcomes are pertinent: Outcome 1 – on understanding disaster risk, Outcome 2 – on strengthening governance to manage disaster risk, Outcome 3 – on reducing disaster risk and Outcome four – on enhancing disaster preparedness, response and recovery measures in relation to solid waste management.

Links to Identified Shocks, Stresses and Constraints

Port Vila's exposure to earthquakes, tsunamis and flooding could result in large amounts of urban disaster waste such as concrete, steel, wood, material from damaged buildings or infrastructure such as parts of power and telephone grids. Healthcare waste, damaged boats, cars, buses and bicycles are also common forms of waste generated by naturally triggered disasters. One of the consequences of a sudden *shock* in Port Vila includes the potential for collapse of solid waste collection and management services, including a possible loss of waste managers. Such a scenario could pose serious health risks with uncontrolled dumping and waste piling up, (including unmanaged hospital health care waste leading to the spread of disease and infection). Additionally, incorporating the use of effective circular economic activities before a disaster may enable the reuse of certain materials, reduce waste and decrease reliance on expensive imported materials.

Chronic waste *stresses* in Port Vila are linked with irregular waste management and unaffordable collection fees for low-income households and businesses, resulting in illegal dumping or burning of waste. Numerous health risks can arise from dumping waste including the potential for increase in disease vectors (through flies, mosquitos and rats), negative impacts on drinking water, waste pile collapses or fires, and cuts from sharp objects, in addition to the destruction of valuable land such as mangroves, rivers and agricultural land, for example.



Image 10: Devastation after Cyclone Pam. Source: Humans of Vanuatu.

Data Gaps

The following gaps in data relating to solid waste and sanitation management were identified:

1. An absence of disaster risk reduction measures for solid waste management were identified through the research. Through the Pacific Cities programme, a risk geographic information system (risk-GIS) of infrastructure for Port Vila was reportedly produced but online versions of this information are not available
2. An evaluation of the landfill collection fees system does not appear to have been undertaken since the new system was implemented, which could provide valuable insights on the gaps in the system. If an evaluation does exist, it has neither been shared with PVMC nor is it publicly available
3. Equally, an evaluation of the pay as you go service (yellow garbage bags whereby the collection fee is included in the purchase of the bag) does not appear to have been conducted and could provide valuable insight into the effectiveness of the system
4. No known assessment of the extent to which illegal alternative measures such as burning and throwing rubbish in ravines are undertaken to avoid fee paying
5. No known evaluation of the organic compost market initiative

Additional Relevant Studies

The following eight documents have been identified as key additional data produced on solid waste management in Port Vila. A summary of each document is provided below.

A list of key studies and analysis of solid waste management in Port Vila	
1	Vanuatu Country Profile published by the Pacific Region Infrastructure Facility (PRIF) 2018
2	2014 Solid Waste Management in the Pacific Vanuatu Country Snapshot by ADB
3	Planning for Ecosystem-Based Adaptation in Port Vila, A Synthesis Report by SPREP
4	Vanuatu National Assessment Report, 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development, 2010 by UN Department of Economic and Social Affairs
5	Solid Waste Survey Results for Port Vila Municipality, 2013 by PVMC
6	Social Mapping and Analysis of Ecosystem Use by SPREP
7	Lessons learned docs on waste management hosted by SPEP
8	2018 Port Vila Urban Resilience & Climate Action Plan (Unpublished) by UN-Habitat and RMIT University

1. Vanuatu Country Profile published by Pacific Region Infrastructure Facility (PRIF) 2018⁴⁷

This document summarises the state of solid waste management and recycling in Vanuatu in 2018, including the use of technology, material flows, logistics, public policies, institutions, frameworks, financial mechanisms and initiatives. Key relevant highlights include:

1. Tourism has a high impact on solid waste management: cruise ships dispose of their waste in Port Vila. In the ten years leading up to 2014, cruise ship arrivals have increased by 15 percent (over than 230 ships carrying more than 2,000 passengers). Tourism represents nearly 65 percent of the country's total GDP

2. Daily household waste in Port Vila manifests at a rate of 0.427 kg per day. The majority of waste is organic followed by plastic
3. Recycled exports from Vanuatu is low and mainly comprised of used motor and cooking oil as well as scarp steel
4. No household or community recycling programmes exist in Vanuatu other than the cash for aluminium cans run in three communities in Port Vila
5. Port Vila manages its solid waste, offering a collection service two to three times a week with a compactor/tipper vehicle that disposes the waste in Bouffa Landfill (the landfill is run on a semi-aerobic method). Waste disposal equipment was provided by JICA's J-PRISM I project
6. Port Vila uses a prepaid garbage bag system whereby a 100 kg bag costs Vt100. Commercial collection services are offered for a fee based on volume
7. The Vanuatu Department of Biosecurity manages quarantine waste in Port Vila. Existing incinerators are in place to process materials however, given the cost of fuel for incineration, the waste is often disposed of through open fires at landfills
8. The document notes that "the Government of Vanuatu does not finance waste management systems; therefore, local governments are required to draw revenue from landfill disposal fees, prepaid waste collection fees, and property taxes. Collection of these fees, however, is generally poor, affecting services".⁴⁸
9. Port Vila sometimes includes a waste management fee of approximately Vt13,000/ year per property
10. In 2009 the city's overall budget for waste management was approximately Vt49,095,500, with 68% allocated for collection services and 32% for disposal costs

2. 2014 Solid Waste Management in the Pacific Vanuatu Country Snapshot by ADB⁴⁹

This report notes that economic development arising from tourism may be at risk due to poor waste management practices in Port Vila. It is estimated that in 2014, PVMC's trucks collected 60 percent of household, office and commercially generated waste in Port Vila Municipality (PVM) (for a population of 49,000). The PVMC has five waste collection vehicles, three of which are compactor trucks (one which is often under repair). It is noted that most of the equipment in Port Vila has been donated and is old. Fuel and spare parts are reported to be in short supply due to limited funding.

Of concern is the absence of waste collection at the edge of the municipal boundary of Port Vila or the peri-urban settlements, home to approximately 40,000 people who dump or burn their waste. What happens on the Shefa side of the municipal boundary has a ripple effect inside the municipality.⁵⁰ Private companies and self-haulers are estimated to collect 10 percent of waste in the peri-urban areas. It is reported that those without waste services (resorts, residents and waste collectors) tend to "dump waste in streams and ravines, and the rubbish is then washed down directly into prime tourist areas along the coast" and within Port Vila's Municipality. Across the entirety of Greater Port Vila, home to approximately 70,000 people, only half of the solid waste is collected; the other half is burned or dumped.

ADB estimates that solid waste generation from households and non-households in Great Port Vila averages between one and 1.5 kilograms per person per day, which is equivalent to 70 tons of solid waste per day based on a population figure of 70,000.

Including waste generated from ships, the total is estimated to rise to 75 tons per day. Moreover, the ADB notes that with projected population growth, the total could reach 145 tons per day over the next 20 years.

Regarding the financial aspects of solid waste management in Port Vila, "high tipping fees, together with the remote location and poor condition of the access road, are major disincentives for households, businesses, and government offices" accessing what is described as "an improved but still non-sanitary open dumpsite". Fees for commercial and self-haul trucks to dump at the Bouffa Landfill must be paid at PVMC (in the city centre), and with proof of a receipt, users may dispose of rubbish at the landfill. Prices range from Vatu 1,033 for a pick-up truck, Vatu 7,950 for a private dump truck, Vatu 5,165 for a large septic disposal and Vatu 15,890 for expired white goods such as fridges.

Based on PVMC record keeping, the ADB reports the total fees paid in 2012 could support the operation of the waste collection and disposal systems by PVMC. In that year, waste collection fees totalled Vatu 28.8 million (\$313,000) while collection fees at Bouffa Landfill accrued another Vatu 20 million (USD 217,000). The report cites an extra-legal ban

applied by PVMC to commercial waste haulers within the municipality, describing it as undermining the development of a commercial waste collection industry in Port Vila.

3. Planning for Ecosystem-Based Adaptation in Port Vila, Vanuatu, a Synthesis Report by SPREP⁵²

The report provides an overview of the steps taken towards ecosystem-based adaptation projects in Port Vila through analysing investment in the maintenance of ecosystem functions and services people rely on to survive. The report lists a number of major threats to Port Vila's ecosystems including pollution from poor sanitation and solid waste management practices by communities, industries, agriculture and ocean-based pollution from boats.

4. Vanuatu National Assessment Report 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development

This report by the national government notes that waste management remains a challenge in Vanuatu, particularly the problem of solid waste disposal in urban areas. It states, "There are currently no regulations for wastewater management or monitoring of receiving environments".⁵³ It notes that while Vanuatu has ratified the Persistent Organic Pollutants (POPs) listed in the Stockholm Convention, there is currently no systematic process in place to implement it. The report also notes that the Port Vila Municipal Council has "sufficient powers granted under the Public Health Act of 1994 and an excellent land fill in Bouffa to deal with solid waste management" but that "the problem lies in institutional weakness and limited capacity to deal effectively with solid wastes".⁵⁴

5. Solid Waste Survey Results for Port Vila Municipality 2013

The solid waste survey is described as "the first comprehensive waste characterisation survey for Port Vila Municipality".⁵⁶ The study took place between 2011 and 2013, surveying 50 households, 12 businesses and two markets in order to identify the types of facilities required based on the current generation of waste, how best to improve services (i.e. recycling services, sizes of rubbish trucks for collection services, sizes of wheelie bins and other waste equipment) and to better plan initiatives around 1) waste separate at source 2) collection systems for recyclable and non-recyclable waste and 3) organic composting for household and market waste. Key findings about waste composition include:

1. Average output of mean daily household waste = 0.43 kg, of which 61% is organic waste
2. Average output of mean daily business waste = 13.73 kg. Offices generate 37% paper waste; hotels generate 48% food waste; and retail businesses generate 51% cardboard waste
3. Average output of mean daily market waste = 5.7 kg, of which 54% is grass, leaves and wood.

6. Social Mapping and Analysis of Ecosystem Use⁵⁷

This report is a technical summary of the findings from the first phase of the Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM) activity conducted in Greater Port Vila between January and June 2016. Urbanisation and climate change, amongst other challenges, were listed as top concerns for neighbourhoods in Port Vila in years to come. Pollution was cited as one of the biggest threats to Port Vila's "terrestrial, coastal and freshwater ecosystems".⁵⁸ Commonly identified pollutants from local sources included: "hospital waste (Seaside), factory waste (Tagabe Bridge, Blacksands), human waste (Tagabe Bridge, Blacksands, Seaside, Fres Wind), animal waste (Mele, Ifira, Erakor Village), landfill (Etas), plastics and mixed product burn piles (all communities), oil spills (Ifira, Erakor Village) and increased sediment influx due to clearance of riparian areas to make gardens (Tagabe Bridge, Blacksands, Etas, Fres Wind, and Mele)".⁵⁹ Actions prioritised by local communities included: "clean-up programmes (Erakor Bridge, Pango, Seaside, Erakor Village) and pollution and proper waste disposal programmes (Tagabe Bridge, Blacksands, Seaside, Etas)".⁶⁰

7. Lessons learned docs on waste management hosted by SPREP

There are numerous lessons learned documents hosted on the SPREP website regarding waste management. However, most are ten years or older making them less relevant to the current context due to new developments in policies, frameworks and operational procedures in the management of solid waste.

Mapping of power, interest, and resources of active stakeholders in solid waste and sanitation management

The photo maps perceived understanding of power, interest and resources of stakeholders active within waste management activities in Port Vila. The mapping concludes the following:

High power and high interest:	No discernible trend exists within the identification of actors with high power and high interest. The actors identified include the Department of Health, the Recycle Association, DEPC Waste Management and DFAT.
High power and medium interest:	The National Council of Chiefs was perceived to have high power and medium interest in waste management.
High power, low interest:	Both MFAT and Au Bon Marche (ABM) were perceived as having high power but a low interest in waste management.
Medium power, medium interest:	Government, individuals and businesses, NGOs and donors engaged in various aspects of waste management were perceived to have medium power and a high interest. These include PVMC Waste Management, PVMC Environmental Office, PVMC Ward Secretaries, PVMC waste collectors, Shefa Province, Erakor, Mele and Pango waste collectors, Green Wave, Recycle Corp, Azure, Centre for Environment, Fisheries and Aquaculture Science (CEFAS), SPC, SPREP, Oxfam, the Vanuatu Environmental Science Society (VESS), Wan Smol Bag, World Vision, Vanuatu Christian Council (VCC), JICA, the World Bank and ADB.
Medium power, medium interest	Tusker (a local brewer in Port Vila) was the only actor perceived to have medium power and medium interest in waste management.
Low power, medium interest	Finally, TVL was understood to have low power but a medium interest in waste management.

In summary, a large number of diverse stakeholders engage with waste management in Port Vila. In regard to resources, stakeholders with perceived high levels of resources include the Department of Health, the Recycle Association, DEPC Waste Management, DFAT, MFAT, ABM, Tusker, PVMC Waste Management, Recycle Corp, World Vision, Wan Smol Bag, VESS, PVMC Environmental Office, PVMC Ward Secretaries, Oxfam, ADB, the World Bank, JICA, SPREP, CEFAS, SPC and TVL.

Below is a table that transposes the information from the photograph above indicating degrees of power/influence from low, medium to high and degrees of interest, also from low, medium to high. An asterisk indicates actors with perceived resources (skills, finance or experience). The table depicts perceived levels of power and influence (on the vertical axis) and level of interest (on the horizontal axis).

Power/Influence	High	MFAT	National Council of Chiefs	<ul style="list-style-type: none"> ● Department of Health ● Recycle Association ● DEPC Waste Management ● DFAT 	
		ABM			
	Medium		Tusker	<ul style="list-style-type: none"> ● PVMC waste management ● Green Wave ● Recycle Corp ● World Vision ● WSB ● VESS ● ADB ● World Bank ● JICA ● VCCI ● Shefa Province ● Erakor, Mele and Pango waste collectors 	
		TVL	<ul style="list-style-type: none"> ● PVMC Environmental Officers ● PVMC Ward Secretaries ● PVMC waste collectors ● Oxfam ● SPREP ● Azure ● CEFAS ● SPC 		
Low					
		Low	Medium	High	
	Interest				

Table 4: Power/Interest Mapping: Solid Waste and Sanitation Management.

Specific role of local government

In Vanuatu, municipalities have legal responsibility for the management of solid waste within their boundaries, according to the “Decentralisation and Local Government Regions Act 1994” (of which there were some amendments in 2013).⁶² Currently, PVMC manages solid waste collection within its boundaries as well as activities at the Bouff landfill. The new Vanuatu Waste Management Act could change that by licensing waste management operators under the control of the Department of Environmental Protection and Conservation (DEPC).⁶³

Policies, Plans and Initiatives (PPI) Analysis

Through the process of this research, a municipal waste management strategy was not identified. Therefore, this section highlights key policies, plans and initiatives in Port Vila at a national and wider Pacific regional level that relate to urban waste management.

National policies

1	National Waste Management and Pollution Control Strategy and Implementation Plan 2016 – 2020⁶⁴
National policies	<p>Developed by DEPC, the National Waste Management and Pollution Control Strategy and Implementation Plan (NWMPCSIP) 2016 - 2020 is aligned with all national policies listed in this section. The purpose of the NWMPCSIP is to “minimise the generation of waste and waste going to landfill, while maximising the recovery of resources and improving the management of residual waste using environmentally sound techniques”.⁶⁵ The nine objectives within the plan all related to urban waste management and should be considered a priority in any municipal waste management, plan, policy or project developed for Port Vila. The NWMPCSIP’s objectives are:</p> <ol style="list-style-type: none"> 1. To support waste management and pollution control activities with practical, effective, enforceable legislation 2. To make waste management systems and programmes financially self-sustaining (establish incentive schemes that implement the polluter pays principle by encouraging cleaner production and waste recovery) 3. To develop skilled and trained people in Vanuatu to effectively manage waste management and pollution control systems 4. To reduce the amount of waste generated at source and land fill 5. To implement effective waste collection and disposal throughout Vanuatu and limit the impact of waste and pollution on urban areas and ecosystems 6. To improve waste and pollution control management, infrastructure and support sustainable operation and maintenance 7. To better coordinate national waste management activities and ensure that the National Waste Management and Pollution Control Strategy is implemented and periodically reviewed and updated to achieve the stated goal and purpose 8. To increase public awareness of waste management responsibilities 9. To introduce and enhance community participation on waste management.
2	National Sustainable Development Plan 2030 (NSDP)⁶⁶
National policies	<p>Vanuatu’s National Sustainable Development Plan for the period of 2016-2030 is entitled, “Vanuatu 2030, The People’s Plan”. Waste management falls within the environment pillar, specifically the second goal around blue-green economic growth. Policy Objective 2.4 seeks to “Reduce waste and pollution through effective waste management and pollution control”⁶⁷. The NSDP states that social and economic progress is dependent upon sound “sound environmental and waste management”⁶⁸.</p>

3

National Environment Policy and Action Plans 2030 (NEPIP)⁶⁹

National policies

The NEPIP can be described as “an overarching policy for the sustainable conservation, development and management of the environment of Vanuatu”⁷⁰. It has a number of policy goals and guiding principles. The goal most relevant to solid waste management is the “Waste management and pollution control” goal and objective 3, of which there are several sub-outputs:

- Reduce waste and pollution through effective waste management and pollution control.
- Review and implement the National Waste Management Strategy and Action Plan.
- Establish incentive schemes that implement the polluter pays principle by encouraging cleaner production and waste recovery.⁷¹

4

National Biodiversity Strategy and Action Plan (NBSAP)⁷²

National policies

The NBSAP is a plan that deals with biodiversity in Vanuatu. As waste affects marine life, municipal waste management strategies may find it useful to consult the NBSAP to ensure waste management actions coordinate with, and compliment, the actions listed in this strategy.

5

Vanuatu Climate Change and Disaster Risk Reduction Policy (2016-2030)⁷³

National policies

In this policy document on climate change and disaster risk reduction, waste management is described as an opportunity for multi-party investment in climate change action and disaster risk reduction. While waste management is not a strong focus within this policy document, the policies listed should be consulted to design holistic municipal waste management processes that consider climate and disaster implications.

National Legislation

1	Environmental Protection and Conservation Act [Cap 283]⁷⁴
National Legislation	The Environment and Conservation Act of 2002 declares the Department of Environmental Protection and Conservation as the designated lead national agency for solid waste management. Within DEPC, there is a Waste Management and Pollution Control Officer who deals with waste management issues. The national government engages with policy issues related to waste, leaving operational issues to be managed by municipalities.
2	The Waste Management Act No. 24 of 2014⁷⁵
National Legislation	The act identifies specific responsibilities for waste collection, disposal, planning and reporting in addition to the management of hazardous waste. The responsibilities outlined in the act are shared between DEPC, municipal and provincial councils, the Ministry of Health and the Department of Biosecurity in Vanuatu. It also establishes penalties for noncompliance. In 2018, three orders were made under the act to address the control of single use plastic: a.) banning plastic bags, plastic straws and polystyrene takeaway boxes; b.) banning littering and c.) licensing of private waste operators.
3	Pollution (Control) Act. No. 10 of 2013
National Legislation	The Pollution (Control) Act No. 10 aims to control the discharge and emission of pollution in Vanuatu. The Act creates a framework to develop and introduce pollution standards, permit systems and compliance actions when pollution occurs.
4	Maritime Authority Act (Amendments) 2002, 2003, and 2004
National Legislation	Amendments were made to the Maritime Authority Act in 2002,2003 and 2004. While the Maritime Authority Act does not relate directly to municipal waste management activities, it does contribute indirectly to guiding aspects of waste collection and disposal in relation to the coast and marine life.
5	Public Health Act 1994 to prevent littering
National Legislation	While the Public Health Act does not relate directly to municipal waste management activities, it does contribute indirectly to guiding aspects of waste collection and disposal and may be helpful to consult where appropriate.

Regional Policies

1	Regional Waste Management and Pollution Control Strategy 2016-2025 “Cleaner Pacific 2025”⁷⁶
Regional Policies	<p>The “Cleaner Pacific 2025” is a “long-term strategy for integrated and sustainable waste management and pollution prevention and control in the Pacific islands region over the next decade (2016–2025)”. It provides specific indicators, targets and strategic actions for municipal solid waste in relation to the 3Rs and municipal composting. The document offers a list of potential partners and of the types of activities that offer a holistic approach to waste management. These include strengthening institutional capacity, promoting public-private partnerships, implementing known good practices in waste management and pollution control, developing human capacity, improving dissemination of outcomes and experiences and finally, promoting regional and national cooperation.</p>
2	SAMOA¹⁰ Pathway for sustainable development goals⁷⁸
Regional Policies	<p>This document outlines commitments made SIDS leaders in in 2014. A number of interlinked thematic areas are prioritised as important for achieving the SDGs based on the contextual nuances of the Pacific. Waste management is listed as one of the key thematic areas. Regional frameworks linked to waste management in the Pacific include: Pacific Regional Solid Waste Management Strategy; Asbestos Management Strategy and Action Plan; E-waste Management Strategy; and a Health Care Waste Management Strategy.</p>

¹⁰ SAMOA stands for SIDS Accelerated Modalities of Action. SIDS is an acronym for Small Island Developing States.

Initiatives

1	<p>The Japan Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM) included the following initiatives:</p>
Initiatives	<ul style="list-style-type: none"> ● Household Solid Waste Characterization Survey Training in May 2011. This report presents key findings of a survey training on household solid waste characterization at Fresh Wota, Port Vila. The findings largely coincide with citywide findings on the types and amount of waste generated. ● Draft Bill for the Waste Management Act No. 2012. An Act to provide for the protection of the environment through encouragement of effective waste services and operations. ● Consultation paper: Bills for the Pollution Control Act and Waste Management Act, recorded as a consultant paper. ● The 'Clean Pacific 2012/Klin Vanuatu' is a project whereby eco-bags and shirts were distributed as part of an awareness campaign. ● The 'Draft Market Waste Composting Pilot Project Report' is for a pilot project to develop a market waste composting system in Port Vila. ● A 'Rough Plan for Mama's Markets Collection Education' project is an awareness campaign on waste management, including composting and recycling for market sellers. ● The 'Business/Commercial Waste Survey Report' determines the amount of business / commercial waste generated and puts forward ideas for a collection system for recyclable waste. ● The 'Waste Audit Results for PVMC', a presentation that informs PVMC on key findings from the solid waste management survey conducted in 2011 and 2013.
2	<p>Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II)</p>
Initiatives	<p>J-PRISM II runs from February 2017 – February 2022 (five years) across nine countries, including Vanuatu. The goal of the project is "Human and institutional capacity base for sustainable Solid Waste management in the Pacific Region is strengthened through implementation of the "Cleaner Pacific 2025".⁸⁰ This includes a focus on the "3R+Return" concept to promote the "recycling and appropriate disposal by exporting (returning) valuable waste or difficult waste for disposal, while returning organic waste into soil for the effective utilization"⁸¹. Target initiatives include improved governance and human resource development, focusing on Port Vila, Luganville, and Lenakel. A specific list of activities and projects was not available online.</p>
3	<p>Banning of single use plastics</p>
Initiatives	<p>As of 1 July 2018, the Vanuatu Government has placed a ban on single use plastic shopping bags, polystyrene takeaway boxes and plastic straws.</p>

4 Vanuatu's Azure Pure Water's Giveme-5 recycling scheme**Initiatives**

Azure Pure Water launched its "Give Me 5" bottle buy back and recycling scheme, offering a Vt\$0.05 rebate on clean bottles returned to the factory. Azure Pure Water is also partnering with a local recycler and the packaging supplier, VISY of Australia, to export bales of plastic for recycling.

5 Shruder plastic shredding machine**Initiatives**

The Shruder plastic recycling machine shreds and extrudes plastic waste, which can then either be sold to plastic recyclers or "extruded into filament or cord to be made into other products such as artwork, handicrafts, and 3D printer filament"⁸².

6 PacWaste (2014-2017) programme**Initiatives**

Implemented by SPREP, this programme focused on e-waste management through a pilot project that promoted the safe dismantling and export of e-waste and raised public awareness. SPREP is partnering with a local recycler. The project also facilitates export of used lead-acid batteries to the Republic of Korea for recycling.

7 UNDP debris recycling programme⁸³**Initiatives**

UNDP ran a debris-recycling programme after Cyclone Pam as a part of a larger waste management and livelihoods recovery programme. Further guidance on recycling disaster debris is provided in a waste management manual by SPREP.

8 Market composting of green waste⁸⁴**Initiatives**

The project took place at the main market in Port Vila, which generates 11.5 tons of green/organic waste per day and is owned by the council. It was implemented through a Public and Private Partnership Programme (PPP) whereby Rainbow Garden, a private local company involved in the floriculture activities and botanical garden, receives the market's organic waste. Market management transports the waste to Rainbow Garden. A petroleum company donated the drums to store the waste and Wan Smol Bag Theatre company designed the drums with decorative signs to help vendors know where to deposit waste.

9 Introducing Pre-paid Garbage Bags⁸⁵**Initiatives**

In an effort to find a better mechanism for managing waste collection and associated fees, PVMC introduced the Pre-paid Rubbish Bag System, a “Pay as You Throw System” that is practiced in Japan and New Zealand, among other places. People pay based on the amount of waste generated.

10 The Pacific Network for Environmental Assessment (PNEA)⁸⁶**Initiatives**

PNEA supports government officials from Pacific island countries and Pacific Island Environmental Assessment Practitioners in SPREP member countries, working in the area of environmental assessment. This network may be interesting to PVMC.

11 Aluminium can recycling programme⁸⁷**Initiatives**

Separate to the recycling scheme described above, a cash for aluminium can return programme is run by Vanuatu’s Department of Environment Protection and Conservation (DEPC), in collaboration with Wan Smol Bag Theatre - a local nongovernment organisation - Port Vila Municipality, and JICA. Three communities in Port Vila deposit empty cans in bags placed at a post office. Recycle Corp then pays Vt40/kg for the cans, and the revenue is allocated to the three communities.

Key Findings for Solid Waste and Sanitation Management

- Public awareness campaigns about how waste management works and why it is important to public health and the environment, among other aspects of life, may be a critical first step in helping people within Port Vila understand PVMC's motives for effective waste management.
- Mapping and understanding waste management trends at a ward level may be a helpful method for understanding where waste is thrown and why in order to design effective waste management strategies that work for everyone, including marginalised and vulnerable residents. It is important that this is not a "name and shame" exercise and is sensitively managed through Ward Secretaries.
- Waste for cash is a theme that should be explored further, especially for youth entrepreneurs. Some activity is already taking place in this space, namely by World Vision. As part of a waste management strategy, identifying areas that could benefit from activities such as waste collection, recycling or composting could assist economically marginalised groups to bolster income.
- Coordination of the various waste management activities between PVMC and community groups may result in a more effective and collaborative approach to overall waste management by identifying overlaps and addressing gaps.
- Amid the various long-term policies and strategies for waste management, pollution control and reducing environmental impact, the biggest challenges hindering effective waste management are around limited human resource capacity and lack of government funding.⁸⁸
- Even after recent improvements to Port Vila's port, there remains a need to upgrade quarantine waste infrastructure and waste disposal services specifically for ships.⁸⁹
- Port Vila is not located on a trans-shipment port or on a cost-effective shipping route, which means initiatives that rely on the exportation of waste or recyclable materials must consider the high costs associated with export.⁹⁰
- Support from development and donor partners is required to design appropriate financial mechanisms and policies to support recycling efforts. Current policies prohibit recycling from being profitable with metal recycling marginally profitable under current market conditions. According to the ADB, as of 2014, four recycling companies were in operation, three of which closed down while the remaining company cut its operations by half due to "a decision by the national government to classify scrap metal and other recyclable materials as "second-hand goods," which incur a 15% export duty".⁹¹
- More transparent and accountable processes appear to be needed in regard to recording income from the landfill. Moreover, a broader monitoring and evaluation strategy is critical to the success of the landfill and collection services provided by the city.
- Ward committees may be valuable partners for PVMC to develop effective waste collection plans that foster better governance through partnership, accountability and transparency.⁹² They may also assist with monitoring and evaluating waste collection.
- A 2016 "Country 3R Progress Report"⁹³ by the Vanuatu National Government describes the country's efforts and achievements towards the underlined goals of the Ha Noi 3R Declaration on the three Rs (reduce, reuse and recycle). The following challenges in reducing solid waste in urban and rural areas in Vanuatu exist:
 - Policy: Low coordination between stakeholders for waste management
 - Institutional: Low human resource capacity
 - Technological: Lack of experts for waste management

- Financial: Limited government budget for waste management
- Organic waste: A lack of human resources and appropriate technological capacity to implement a full-scale organic component of municipal waste
- Recycling: metal and e-waste recycling practices are rated as poor (less than 50% of waste both types of waste is recycled) and all other forms of recycling as non-existent (including paper, plastic, construction)
- Clean technologies: no specific policy exists
- Training facilities or centres: Only one training facility – the Chamber of Commerce – was identified in the course of the research with approximately 1000 USD reportedly spent on training SMEs and practitioners.



Image 12: Port Vila, Vanuatu. Source: Liz Rose.

2.3. Line of Action 3: Youth Employment and Economic Development

The current socio-economic context of Port Vila is a culmination of high youth unemployment rates, a low wage economy for unskilled workers, a lack of jobs for young people, a high cost of living, and rapid social change. The Secretariat of the Pacific Community (SPC) describes youth unemployment as one of the top challenges facing young people in the Pacific.⁹⁴ Youth who leave school early or do not have experience in the formal economy face even greater employment challenges that may result in economic and social marginalisation. Such marginalisation and even exclusion are often magnified for youth in urban settlements, women and those with disabilities. Moreover, youth with education or work experience still struggle to find access to quality jobs based on structural issues within the local and national economy.

According to the Vanuatu National Youth Development Policy 2012-2022⁹⁵, people under the age of 30 make up 68 percent of Vanuatu's total population. The policy uses the analogy of a family to bring this statistic to life by saying if Vanuatu was a family of 10, seven people would be children, two adults and one an older person, stating that: "How this house sustains, or how this family reproduces itself is positively correlated to the investment it puts in these young people".⁹⁶ Addressing the nation's youth bulge, and indeed that of Port Vila, should be part of a broader effort to address shortcomings in the supply of labour, the quality of education and the cost of urban living, among other things.



Image 13: Fishing in Port Vila lagoon. Source: Louisa Cass, AusAID.

Links to Global Frameworks and Agendas

There are a number of global frameworks and agendas that focus on youth employment. For instance, SDG 8 which is to, "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all". Chapter 3 of the 2018 *World Youth Report: Youth and the 2030 Agenda for Sustainable Development*⁹⁷ discusses important challenges related to youth underemployment, formal and informal work, the working poor, marginalised and vulnerable youth, disability and migration amongst others. This report may be a helpful resource for developing activities to address youth employment challenges.

The New Urban Agenda also has a number of key commitments relevant to youth employment such as creating equal opportunities for youth and reducing the impact of disasters. Those working on youth employment in Port Vila should also consider the 2016 Youth DeclarACTION for the New Urban Agenda Goals, which includes six thematic areas. Youth employment is covered within the thematic area entitled, "sustainable and inclusive urban prosperity and opportunities for all", which has the following three goals:

1. "To eliminate youth unemployment, giving special attention to young women, minorities, marginalized youth and migrants.
2. To regulate the informal sector and prevent the criminalization and stigmatization of artistic and economic activities realized by young people and informal workers, particularly in public spaces.
3. To foster youth entrepreneurship, as well as promote local economies, fair trade and new models of economy".⁹⁸

Finally, the Sendai Framework for Disaster Risk Reduction also is critical to consider in disaster prone countries like Vanuatu. The framework highlights that young women and men have an important role to play as proactive agents of change in prevention and preparedness activities at municipal and national levels, especially in relation to education, skill development and employment opportunities. The framework also has a version reinterpreted for children by children, which may be appropriate to consider, especially target three, which aims to reduce disaster related damage such as job and infrastructure loss.

Links to Shocks, Stresses and Constraints

Declared the most disaster-prone country in the world, youth in Port Vila and elsewhere in Vanuatu have high levels of exposure to natural hazards including earthquakes, extreme rainfall, cyclones and tsunamis. Higher levels of vulnerability exist for youth in unplanned or unserviced settlements where such hazards can weaken already degraded infrastructure and housing, thus reinforcing cycles of poverty and inequality. The UN estimates that shocks and stresses linked to climate change will exacerbate poverty and inequality; low-income countries such as Vanuatu are expected to bear 75-80 percent of the costs of climate change.⁹⁹ The current Vanuatu National Youth Development Policy notes that extreme weather patterns that disrupt planting and harvesting seasons in rural areas is “fast becoming a priority issue” as it is likely to result in increased patterns of urban youth migration for economic purposes.¹⁰⁰ For more information regarding the potential impacts of climate change on Port Vila specifically, refer to **Annex V. Key Messages on Climate Change**.

Data Gaps

1. The most robust data available on youth employment in Port Vila was collected in 2009. Thus, conclusions from this data should be drawn with caution and an appreciation that identified trends within the data may have changed.
2. The criteria for determining who counts as unemployed is not clear, which may mean that youth unemployment rates could be higher than 14 percent as census data suggests.¹⁰¹ Thus, data is cited cautiously in this report with knowledge that statistics and evidence may be underdeveloped or out of date.
3. There is a lack of baseline data to inform the National Youth Policy 2007-2011, which included employment opportunities as one of its focal areas. The lack of data is significant because it means that while the achievements of the first National Youth Policy can be accounted for, improvements cannot be measured (an evaluation that measures achievements in the first National Youth Policy was not found in the process of this research).

Additional Relevant Studies

Additional city-level data on youth employment shared below is derived from 2009 Census data published in a 2012 report entitled, *Youth Monograph*.¹⁰² The *Youth Monograph* defines unemployed youth as “the number of active job seekers as a proportion of the total employed population plus those actively looking for work (called the labour force)”.¹⁰³ It recognises that current unemployment rates do not fully reveal the true extent of youth employment due to exclusion of “discouraged job seekers” i.e. “those who are not actively looking or work because they believe that no work was available”.¹⁰⁴ In November 2009, the average urban unemployment rate was 14% (12% for males and 18% for females of all ages). The Monograph defines youth as persons between the ages 12 and 30.

Below is a summary of urban youth unemployment rates based on gendered age groups.¹⁰⁵

38% for 15-19-year-old males

43% for 15-19-year-old females

21% for 20-24-year-old males

24% for 20-24-year-old females

11% for 25-29-year-old males

19% for 25-29-year-old females

7% for 30-34-year-old males

14% for 30-34-year-old females

Based on 2009 census data, the largest share of young people, aged 15-29, are recorded holding the following top 15 occupations in Port Vila:

-
1. Cashiers

 2. Client information workers

 3. Service and sales workers

 4. Computer network and systems technicians

 5. Building and related electricians

 6. Salespersons

 7. Contact centre salespersons door-to-door salespersons and service station attendants

 8. Entrepreneurs

 9. Cabinet makers and related workers

 10. Legal social and cultural professionals

 11. Building and related trades workers excluding electricians

 12. ship crew and super cargo freight handlers

 13. Bank officers, debt collector lenders, brokers agents

 14. Building caretakers

 15. Agricultural and industrial machinery mechanics and repairers¹⁰⁶

Based on 2009 census data, the following occupations in urban areas have the highest share of young females aged 15-29 years:

-
1. Cleaners and helpers

 2. General and keyboard clerks

 3. Personal care workers

 4. Sales workers

 5. Health professionals

 6. Business and administration associate professionals

 7. Business and administration professionals

 8. Customer services clerks

 9. Personal service workers

 10. Teaching professionals

 11. Numerical and material recording clerks

 12. Administrative and commercial managers

 13. Other clerical support workers¹⁰⁷

Data for young males was not presented in the same way as the data on young females shown above. However, based on 2009 census data, the Monograph finds that the occupations in urban areas with highest share of young males aged 15-29 years are:

-
1. Building and related trades workers (excluding electricians)

 2. Drivers and mobile plant operators

 3. Metal machinery and related trades workers

 4. Electrical and electronic trades workers

 5. Protective services workers

 6. Information and communications technicians

 7. Refuse workers

 8. Other elementary workers

 9. Science and engineering professionals

 10. Science and engineering associate professionals ¹⁰⁸

Lastly, the Monograph records professions that have few or no persons aged 15-29, and while out of date, the data may provide some insight into areas previously overlooked.

-
- Mathematicians and statisticians (0)

 - Electronics and telecommunications engineers (5)

 - Paramedical practitioners (0)

 - Veterinarians, pharmacists and physiotherapists (3)

 - Computer applications professionals (0)

 - Database designers and system administrators (4)

 - Agricultural and life science technicians (2)

 - Health associate professionals (2)

 - Medical and pharmaceutical technicians (9)

 - Veterinary technicians and assistants (0)¹⁰⁹

Stakeholder Analysis

At the RAR-S Workshop in Port Vila, stakeholder analysis was undertaken by developing a list of key stakeholders within youth employment economic development. A power-interest-resource mapping exercise was then undertaken with stakeholders' perceived levels of power and interest ranked as low, medium or high by participants. An asterisk was then given to stakeholders understood to possess resources (skills, finances and/or experience). See **Image 14** below for a photo of the exercise completed by participants in August 2019.

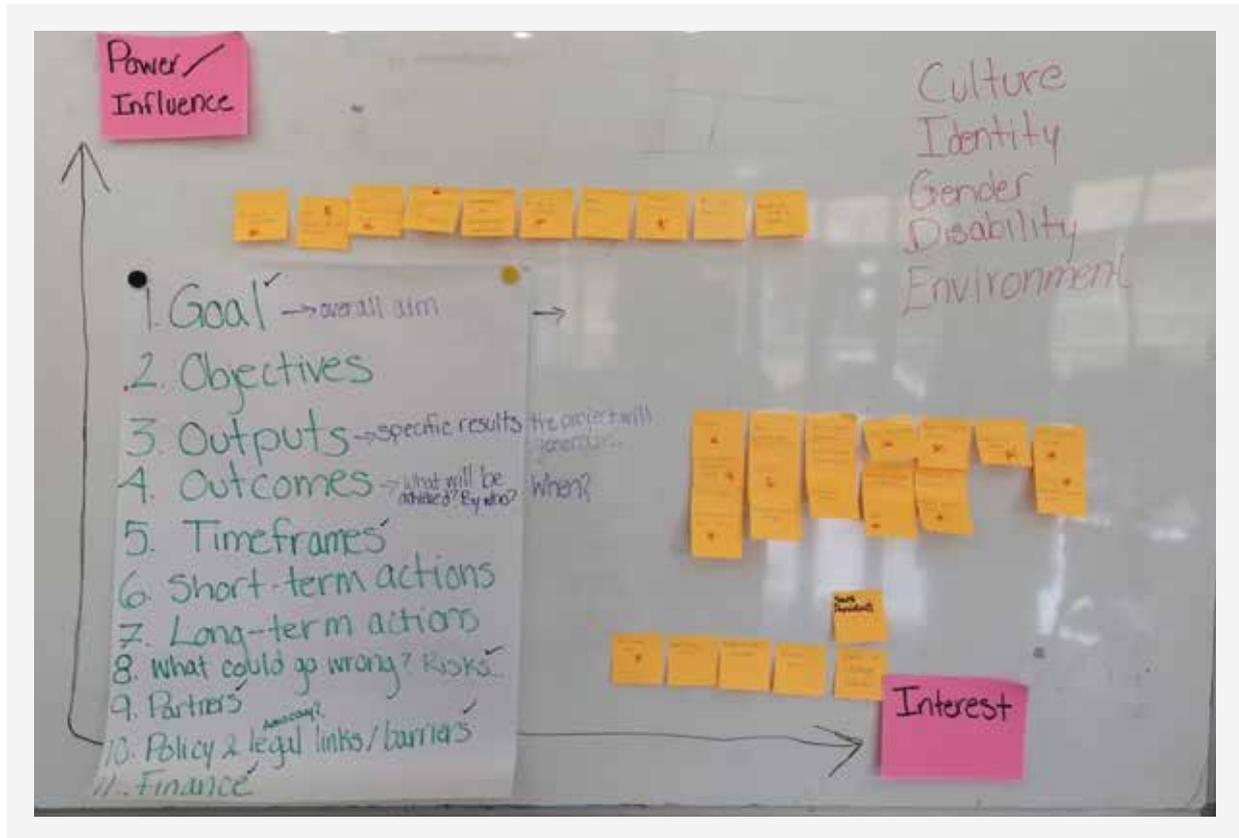


Image 14: Power/Interest Exercise Youth Employment and Economic Development. Source: CRPP 2019.

Mapping of power, interest, and resources of active stakeholders in youth employment and economic development

The photo maps perceived understanding of power, interest and resources of stakeholders active within youth employment activities in Port Vila. The mapping concludes the following:

<p>High power and high interest:</p>	<p>Training and educational institutes and government were identified as holding high levels of power and having high levels of interest in youth employment such as the Vanuatu Institute of Technology, Ministry of Education, other training institutions, Vasanoc sports, foreign governments, PVMC and the Ministry of Youth and Sports.</p>
<p>High power, low-medium interest:</p>	<p>Governments – national, municipal and foreign – in addition to religious organisations are perceived as having a high level of power but low to medium level of interest in youth employment activities including the Ministry of Agriculture, the Vanuatu Football Federation, the Vanuatu Council of Churches and members of parliament and ministers.</p>
<p>Medium power and high interest:</p>	<p>Stakeholders with a perceived medium degree of power but high level of interest in youth employment include organisations such as Oxfam, SPREP, Farm Support Association, the Vanuatu Society for People with Disabilities (VSPD), and the Melanesian Spearhead Group (MSG) as well as networks such as the Youth Livelihoods Network, the gender equality network and government departments or affiliates including Correctional Services, the Tourism Office and the Chamber of Commerce in addition to businesses within the hospitality sector.</p>
<p>Low power and high interest:</p>	<p>Finally, stakeholders with a perceived low level of power but a high level of interest in youth employment primarily include Ministry of Agriculture, the Vanuatu Football Federation, the Vanuatu Council of Churches, Youth Presidents from different provinces, Youth Challenge Vanuatu, Further Arts and Wan Smol Bag.</p> <p>In summary, there are a number of stakeholders active within the youth employment space. Those with perceived resources include the Ministry of Education, training institutions, foreign governments, Oxfam, SPREP, Farm Support Association, the Youth Livelihoods Network and Wan Smol Bag.</p> <p>Below is a table that transposes the information from the photograph above and the description of the mapping. The table depicts perceived levels of power and influence (on the vertical axis) and level of interest (on the horizontal axis). Stakeholders perceived to have high level of power/influence and interested are highlighted in red. An asterisk indicates actors with perceived resources (skills, finance or experience).</p>

Below is a table that transposes the information from the photograph above indicating degrees of power/influence from low, medium to high and degrees of interest, also from low, medium to high. An asterisk indicates actors with perceived resources (skills, finance or experience). The table depicts perceived levels of power and influence (on the vertical axis) and level of interest (on the horizontal axis).

Power/Influence	High	Ministry of Agriculture	Members of parliament and ministers	<ul style="list-style-type: none"> • Training Institutions: APTC, VIT, USP, TVET • Ministry of Education • Vasanoc • Foreign governments • Port Vila Municipal Authority • Ministry of Youth and Sports 		
	Medium	VFF			<ul style="list-style-type: none"> • Oxfam • Farm Support Association • Tourism Office • Vanuatu Climate Action Network • Vanuatu Society for People with Disabilities (VSPD) • RSE/SWP • Young Women for Change • Family Health Association • Correctional Services 	
		VCC			<ul style="list-style-type: none"> • Care International • Vanuatu Institute of Technology • SPREP • Youth Livelihood Network • Chamber of Commerce • Vanuatu Police Force • Hospitality sector • Gender Equality Network • MSG • Climate Change 350 Vanuatu 	
Low			<ul style="list-style-type: none"> • Wan Smol Bag • Rural Training Centre • World Vision Vanuatu • Further Arts • Youth Presidents • Youth Challenge Vanuatu 			
		Low	Medium	High		
	Interest					

Table 5: Power/Interest Mapping: Youth Employment and Economic Development. Source: CRPP 2019.

Specific role of local government

PVMC does not host a particular position or department focused on youth employment. However, as part of wider economic growth and development, the city remains interested in supporting youth employment initiatives.

Policies, Plans and Initiatives (PPI) Analysis

This section identifies key policies, plans and initiatives relevant to youth employment and economic development.

The following seven policies, plans and initiatives are presented as key documents for informing activities related to youth employment. A summary of each policy, plan or initiative is provided followed by identification of relevant links to youth employment activities in Port Vila.

1 National Youth Policy 2007-2011

The major focal areas of this policy include a) Mapping of youth and sports activities b) Strengthening institutional capacity c) Strengthening and establishing partnerships d) Development of quality sport programming, development of rural communities, and, career and employment opportunities development. No online version of this policy was obtained.

2 National Youth Council Strategic Plan 2010-2015

This plan was also not available online and may be an important source of information.

3 Youth Monograph: An analysis of the situation of young people from the 2009 Population and Housing Census^{CX}

The *Youth Monograph* presents statistics from the 2009 Census data with the aim of articulating key trends and changes within the youth demographic. It includes information about youth health, literacy, income generation and access to information and communication.

4 Vanuatu Youth Empowerment Strategy (VanuatuYES) 2010-2019

This plan is not available online and may be an important source of information.

5 Vanuatu National Youth Development Policy 2012-2022 and Strategic Plan of Action 2012-2015^{CXI}

This policy focuses on three key areas for development (1) Educational and entrepreneurial pathways (2) Personal development, and (3) Public participation. Within the educational and entrepreneurial pathway, economic efforts focus on six means of generating employment and skills. These include:

1. "Strengthening the capacity of existing institutions that provide training for skills and entrepreneurial development.
2. Develop and complete a National Action Plan on Youth Employment and allocate resources to its implementation.
3. Empowering civil society groups to complement government institutions in the area of training and skill development for gainful employment.
4. Creating avenues for providing work experience for youths with a view to promoting and developing desirable work ethics and culture for national development.
5. Creating and equipping additional institutions that can provide special training for youths with disabilities, as well as soft credit facilities for trained ones to enable them start off on their own.
6. Development of Youth Challenge fund to assist young people to start a small business".^{CXII}

6

Pacific Youth Development Framework 2014–2023 (PYDF)

This policy focuses on three key areas for development (1) Educational and entrepreneurial pathways (2) Personal development, and (3) Public participation. Within the educational and entrepreneurial pathway, economic efforts focus on six means of generating employment and skills. These include:

1. “Strengthening the capacity of existing institutions that provide training for skills and entrepreneurial development.
2. Develop and complete a National Action Plan on Youth Employment and allocate resources to its implementation.
3. Empowering civil society groups to complement government institutions in the area of training and skill development for gainful employment.
4. Creating avenues for providing work experience for youths with a view to promoting and developing desirable work ethics and culture for national development.
5. Creating and equipping additional institutions that can provide special training for youths with disabilities, as well as soft credit facilities for trained ones to enable them start off on their own.
6. Development of Youth Challenge fund to assist young people to start a small business”.^{CXIV}

7

Pacific Youth Employment Advocacy

The Pacific Youth Employment Advocacy initiative, led by the Pacific Youth Council, lists current Pacific-wide employment opportunities and activities on a Facebook page. It also has a manual for young people who want to engage with advocacy issues.

8

Youth Livelihoods Network^{CXV}

Meeting once a month since August 2013, with support from Oxfam, a number of organisations participate in the Youth Livelihoods Network. In 2014 Oxfam recorded the following member organisations: Farm Support Association (FSA), Save the Children, Vanuatu National Youth Council (VNYC), Youth Challenge Vanuatu (YCV), Wan Smol Bag Theatre (WSB), Vanuatu Rural Development Training Centres Association (VRDTCA), Vanuatu Education Policy Advocacy Coalition (VEPAC), Australia Pacific Training College (APTC), Leadership Vanuatu (LV).



Image 15: Port Vila, Vanuatu. Source: Connor Ashleigh for AUSAID.

Key Findings for Youth Employment and Economic Development

1. Data gaps urgently need addressing in order to take informed actions and design relevant strategies to address challenges around adequate and gainful youth employment. An understanding of current areas of youth labour supply and demand should also be prioritised.
2. The National Ministry for Youth and Sports and the various organisations focused on youth has generated a number of youth initiatives that could better serve youth if the services were located in a single 'home' that promotes various aspects of Vanuatu culture, enhance skills, introduce new technologies and develop entrepreneurial skills. Such an 'information home' could provide better coordination of and access to workforce preparation services and opportunities from employers.
3. Seasonal youth labour mobility patterns from rural to urban and urban to rural areas suggest a unique and significant opportunity for developing urban forms of employment linked to rural production, namely in food production. Urban youth who are unskilled currently rely on ad hoc methods of selling rural produce in vehicles or at markets. Upskilling in marketing, accounting and knowledge of markets and potential commercial buyers may improve the supply and demand of goods.
4. As PVMC does not have a designated role for youth employment services within its office, it may be important to seek a partner with power, influence and resources to address structural changes in the causes of youth unemployment and broader economic issues, the high cost of urban living, and reducing rates of social cohesion.
5. National government youth priority groups as listed in the Vanuatu National Youth Development Policy 2012-2022 and Strategic Plan of Action 2012-2015 include: rural youth, youth at risk, out-of-school and unemployed youth, female adolescent youth, youth with disabilities and talented/gifted youth.
6. There exists a possible oversupply of unskilled labour and potentially weak capacity to enforce labour market regulations.
7. Youth unemployment is strongly tied to overall employment growth. Tackling youth employment prospects is most effective when aligned with broader municipal and national labour market growth.
8. Educational attainment and young people's chances of gaining employment are intimately linked. Policy makers should consider the role of the supply the demand sides of the labour market at macro and micro economic levels in any youth employment strategy.
9. Similarly, the quality of education is strongly linked to employment rates. It is important to monitor the extent to which education delivers the skills in demand. According to the National Youth Policy, "There are still limited employment opportunities for young people, in particular those in urban centres; formal education systems continue to fall short in effectively addressing the varied vocational needs of young people". The most recent data on skill supply is ten years old. There appears to be no data collected on the demand for specific skills.
10. A focus on youth employment is often necessary when institutional frameworks do not adequately to support the transition from education to work in the formal sector.
11. The need for more and better data about youth employment and other youth related issues is stressed by the National Youth Policy: "there is a great need to establish baseline data from youth... through specific research and surveys".
12. Mobility employment initiatives with New Zealand and Australia appear to successfully employ unskilled youth. A large number of the total workers employed in fruit and vegetable picking overseas are below the age of 24. Such schemes allow repeated employment by the same employers, opportunities to be promoted from unskilled work to semi-skilled or supervisory work, an increase in remittances, reported equal recruitment between women and men and reported opportunities (although limited) for employment of physically disabled workers. According to the ILO, some of the risks include harsh worker treatment, inadequate accommodation, hidden fees deducted from pay packets and irregular hours of work.^{CXXIV}

2.4. Recommended Actions for Resilience and Sustainability for Port Vila

This section presents the *Recommended Actions for Resilience and Sustainability*. Actions are organised by the three *Lines of Action* discussed in detail above:



Actions for each of the *Lines of Action* have been designed based on results from RAR-S Workshop held in August 2019, which were informed by the data collection, analytics and diagnostic efforts involved in the CRPP implementation in Port Vila. The actions aim to be holistic approaches to addressing *shocks*, *stresses*, and *constraints* in Port Vila. Specific actions are presented by *Line of Action*.

For each action presented, following a description of the action and its intended impacts in Port Vila, findings from a basic cost-benefit analysis is presented that was conducted to help inform decisionmakers and potentially support efforts to engage with various partners outside of the PVMC. For more detailed information on the cost-benefit analysis, please refer to **Appendix 1. Cost-Benefit Analysis Assessment of Port Vila’s Recommended Actions for Resilience and Sustainability**. In addition, each action includes an assessment of challenges and potential strategies to address them, where applicable, and a listing of key partners who have been identified. Lastly, in certain instances, where applicable, specific linkages to existing policies are noted.



Image 16: Port Vila Municipal Council. Source: Vanuatu Broadcasting and Television Corporation.

Line of Action 1: Land and Property Data Collection and Management



The actions designed to address the land and property data collection and management *Line of Action* include data collection, investment in systems and IT infrastructure as well as communications and awareness raising. Where possible, short and long-term actions have been suggested, along with estimated costs and benefits and an identification of implementation challenges and potential strategies to address them.

1. Prioritise accurate and up-to-date data collection about land and property

This action is first and foremost intended to improve the well-being of Port Vila's residents. A better understanding of land and property will improve tax revenue and enforcement of existing rules, regulations and tax penalties in order to improve key services and the overall well-being of residents. Collection and analysis of land and property data addresses the absence of sound, trust worthy data, which in turn can offer PVMC the opportunity to re-evaluate key income generation procedures, such as valuation; explore more effective ways to collect income, such as the use of online platforms for paying taxes and building permits obtainment; and develop plans to address gaps in service provision such as water, electricity and solid waste collection. More and better data could also enhance information sharing between the departments within PVMC, its national and provincial counter parts, and the general public.

Data collection related to land, property and major infrastructure can be undertaken in the immediate short term by adding additional questions to an existing survey (currently under review) designed for implementation within the five wards. Questions within the following thematic areas are suggested:

1. Land, including: formal (lease) vs informal (no lease); percentage of land area utilised (to ensure room for setbacks allowing emergency service access).
2. Property, including: identification of residential, commercial and government buildings; number of dwellings; quality of property; formal or informal; payment of property tax; number of occupants and age; number of people using a single kitchen (to determine number of families); rented or owned.
3. Key infrastructure, including: water supply, access to solid waste facilities, roads, communication and electricity.

PVMC's Town Planning Unit is able to draw up questions related to land and property and can rely upon assistance from the Vanuatu National Statistics Office (VNSO) to assist with questions related to key infrastructure as these questions already exist from national surveys. Adding to the existing draft of the ward survey is estimated to take one month of work spread out across two to four months; this includes drafting, piloting, revision of survey questions and full implementation of the survey. General data and statistics will be made available to the general public by PVMC.

The support required for pursuing land and property data is primarily around financing and training enumerators to use technology, understand the survey questions and explain the purpose of the survey to neighbourhood residents. Financial support for enumerators is required to cover transportation, food subsidies and mobile phone credits. Some equipment (e.g. tablets) exists at the ward level although additional tablets may be required from VNSO or purchased outright.

Summary of Cost-Benefit Analysis

- A total sum for this activity is estimated to be: **1.6 million Vatu** (320,000 Vatu per ward).¹¹
- Benefits generated as a part of this activity are estimated to be: **Medium**
- The anticipated timeline of the action is: **Two to three months**

¹¹ Additional financial and technical support may be required for data analysis to be carried out. PVMC prefers a technical expert carry out analysis and that financial assistance is provided.

Action implementation challenges and potential strategies to address them

- Development of questions that do not yield the data requested: PVMC's physical planning department will write the questions but support from specialists could help ensure the revision of questions yield the data required.
- A lack of funding for training enumerators and purchasing equipment: A process is currently in place for training enumerators; however, the quality of the survey is partially dependent upon how well the enumerators articulate the purpose of the survey. And, since some of the information may be sensitive, more rigorous training is required. Furthermore, while equipment for collecting data exists, the use of a drone to link survey questions with physical data could significantly increase the accuracy of the data. If a drone was to be used in the data collection, PVMC would require technical support and training on drone and online map usage.

Key partners

Ward Secretaries, Lands Department, VNSO, PVMC Town Planning Unit

2. PVMC seeks support for investment in systems and IT functions

The objective of this action is to increase the efficiency and effectiveness of the PVMC's income generation channels and ability to enforce penalties. Current challenges include an inability to access a number of national databases including, but not limited to, Mapping, Leases, Title Information System, Document Tracking System, and Finance Database of Owners. PVMC has two of its own databases – one on permit tracking and the other on property tax. There is limited to no coordination between national and municipal databases. This could be addressed by hiring a staff member to develop a systems strategy that reviews and implements changes to improve coordination and access between municipal and national databases, develops a database or online platform that links survey data to mapping software, and assesses key revenue streams from an efficiency and effectiveness lens in order to simplify processes. Examples of assessing key revenue streams include adjustment of the validation process in order to reduce rates for low-income areas and increase rates in the Central Business District (CBD), suggesting improved measures for enforcing tax payment and penalties, and measures for identifying falsification of information such as building permits. The ability to pay taxes and purchase permits online are further examples of ways to improve upon efficiencies related to the collection and management of land a property data. Finally, a feasibility study on the potential use of Blockchain technology within Port Vila could be explored, with a view to learning from Fiji and the application of Blockchain there.



Image 17: Port Vila, Vanuatu. Source: Dominic Nessi.

Line of Action 2: Solid Waste and Sanitation Management



The actions proposed in relation to solid waste and sanitation management cover the areas of data collection, coordination of city-level waste management activities as well as a public awareness campaign, and an education programme that offers an extracurricular course to schools in Port Vila. Where possible, short and long-term actions have been suggested with anticipated costs and an identification of implementation challenges and potential strategies to address them.

1. Prioritise accurate and up-to-date data collection about land and property

These activities seek to understand waste dumping patterns in each ward in order to develop strategies for waste separation and management, and potential business opportunities for recycling glass, plastic, cans and composting. Data collection is a short-term action seeks to address the need for accurate and relevant data while the identification of strategies to manage rubbish dumping is a longer-term action that seeks to address public health issues. Additional longer-term actions include a potential link with World Vision's current activities on social enterprise in relation to waste and youth employment across all five wards and potentially within the Youth Workforce Preparation Hub proposed in the youth employment actions (refer to the following section). Turning waste into cash is a potential economic opportunity that could benefit youth and other more vulnerable populations groups. Finally, an introduction of standardised rubbish bins in residential areas may also be a good infrastructure solution to compliment the governance and economic activities suggested above.

Summary of Cost-Benefit Analysis

- A total sum for this activity is estimated to be: **157,000 Vatu**¹²
- Benefits generated as a part of this activity are estimated to be: **Low/Medium**
- The anticipated timeline of the action is: **Three years**

Action implementation challenges and potential strategies to address them

- Sensitivities around identifying illegal dumping trends in each ward can be addressed by thoughtful framing of questions and adequate training for enumerators on how to deal with conflict and dispel tension.
- A lack of funding and expertise to design sensitive survey questions and the need for a conflict-sensitive trainer to facilitate strategies for addressing waste management could be addressed by through an NGO or donor with waste management experience.

Key partners

Chamber of Commerce and Industry, Department of Environment, private rubbish collectors, private sector companies with a CSR arm, recycling companies, Ministry of Education and Training (MOET), inhabitants in specific wards and the general public large.

2. PVMC convenes a waste management Steering Committee

The second action proposed seeks to addresses opportunities for better coordination of current projects and activities at a city, regional and national level, under the responsibility of someone such as the Town Clerk.¹³ In the short-term,

¹² Note that the cost-benefit analysis does not include an evaluation of purchase, placement or maintenance of standardised rubbishbins located in residential areas but focuses sole on data collection.

¹³ The Town Clerk serves in a managerial capacity within the PVMC while officially acting on behalf of the Department of Local Authorities (DLA), which is part of the National Government.

the group could form and immediately begin coordinating waste management projects taking place within municipal boundaries in order to improve efficiency and effectiveness at a city-scale. The coordination meetings may be most beneficial if they are open to all to attend and report in, much like that of an OCHA cluster meeting. In the longer-term, a PVMC-lead Steering Committee could develop an implementation plan for PVMC's waste management strategy. Through a consultant, the Steering Committee could review performance (such as scheduling) and controls (such as measures that can be implemented to reduce the mess left behind by rubbish trucks).

Summary of cost-benefit analysis

- A total sum for this activity is estimated to be: **3 million Vatu**
- Benefits generated as a part of this activity are estimated to be: **Medium/High**
- The anticipated timeline of the action is: **Six months**

Action implementation challenges and potential strategies to address them

- Challenges may involve a lack of commitment from Steering Group members

Key partners

DEPC, DLA, Maritime Authority, Ifira Island Representative, VCCI, SPREP, the Tourism Authority.

3. Public awareness and education

Actions are needed to address the lack of communication about the critical benefits of waste management and absence of educational training materials needed to broaden the currently limited perspective children and their communities have around waste management. Building on PVMC's slogan, "healthy, clean city", efforts around public awareness could seek to engage powerful private sector actors such as Au Bon Marche – current distributors of the yellow rubbish bags – to fund a campaign about what waste management strategies are and why they are important to public health. Such a campaign, envisioned as a short-term action led by PVMC (or its Steering Group) in partnership with a business stakeholder, could also engage NGO actors within the waste management space such as SPC or World Vision to make use of materials already developed. The education component of this action could be a Training of Trainers (ToT) tool that is shared with schools within the municipality as part of extracurricular learning sessions that are offered to students. SPC has an educational tool on waste management that may be appropriate for use in Port Vila. Education related activities are a longer-term action that requires more coordination and strategic engagement with the education system.

Summary of cost-benefit analysis

- A total sum for this activity is estimated to be: **6.04 million Vatu**
- Benefits generated as a part of this activity are estimated to be: **Medium/High**
- The anticipated timeline of the action is: **Two years**

Action implementation challenges and potential strategies to address them

- Mismanagement of funds, which can be addressed through transparent and accountable frameworks with regular monitoring and evaluation processes in place.
- Lack of cooperation, which may be addressed through the formation of the above-mentioned Steering Committee and their ownership of public awareness and education activities if integrated into the envisioned 'Implementation Plan'.

Key partners

Ministry of Education and Training (MOET), Au Bon Marche, SPC, World Vision

Line of Action 3: Youth Employment and Economic Development



Three actions have been proposed centred around addressing the need for accurate and up-to-date data regarding youth employment and challenges related to finding work for both unskilled and skilled youth. While PVMC has no single department or person responsible for improving youth employment, there are a number of activities they can lead on with partners to improve baseline data and increase access to vocational skills training and workforce preparation. Where possible, short and long-term actions have been suggested with anticipated costs and an identification of implementation challenges and potential strategies to address them

1. Collect data on youth employment

In order to create an up-to-date understanding of the present employment trends, data collection on youth employment should be conducted through adding content to an existing ward survey currently under review. Available data on youth employment within Port Vila was generated in 2009 and does not reflect the types of jobs that currently exist, specifically in regard to rapid changes in technology and a significant increase in tourism over the last ten years. Ward Secretaries and others from the PVMC are enthusiastic about adding a youth employment component to their survey draft to make this an achievable short-term action. The collection of data can be organised through the wards and their enumerators; however, support for the development of questions and analysis of data is required in terms of technical skills and financial assistance. There may be scope for support from members of the Youth Livelihood Network.

Summary of cost-benefit analysis

- A total sum for this activity is estimated to be: **1.62 million vatu**
- Benefits generated as a part of this activity are estimated to be: **Low/Medium**
- The anticipated timeline of the action is: **Two to three months**

Action implementation challenges and potential strategies to address them

- Change of government in PVMC: no strategies were identified to ensure the continuity of this action should elections result in a new government.
- Low organisational, financial, and technological capacity: support for the design of questions related to youth employment and analysis of the data is required. Furthermore, financial support is required to hire more enumerators to engage with a longer survey and operational costs such as additional tablets, daily stipends and transportation.

Key partners

PVMC and VNSO

2. Develop a youth commercial agriculture network

This activity involves the development of a youth network that would seek to provide skills upgrading for “unskilled” youth who currently reside in Port Vila but travel to rural areas to harvest produce in order to sell it in Port Vila. Ward Secretaries could assist the network to develop a register of individuals engaged in commercial agriculture and a youth steering group who could plan and manage targeted activities to upgrade their skills. Examples of such activities within this short-term action could include tours of restaurants within the city and an introduction to produce buyers, ToTs by NGOs engaged in financial management training, marketing training, business management or leadership training. Other ideas include hosting a monthly or quarterly youth market day.

Summary of cost-benefit analysis

- A total sum for this activity is estimated to be: **1.57 million vatu**
- Benefits generated as a part of this activity are estimated to be: **Medium**
- The anticipated timeline of the action is: **Three to six months**

Action implementation challenges and potential strategies to address them

- No challenges were identified for this particular action.

Key partners

PVMC, Agriculture Department, and Farm Support Association (FSA)

3. Develop a youth workforce preparation hub

The last action proposed under the youth employment and economic development *Line of Action* includes the development of a Youth Workforce Preparation Hub, a facility/gathering place with a mission to increase access to work force preparation services through information dissemination and hosting of trainings related to youth entrepreneurship, local culture and leadership skills, hosted by PVMC and other stakeholders working in the youth employment space. Consider co-designing the project with the Youth Livelihoods Network (a membership body of nearly every youth focused organisation working in Port Vila, the Chamber of Commerce and the Ministry of Youth and Sports drawing on aspects of their National Action Plan on Youth Employment. The Hub, a long-term action, would have two purposes:

1. Disseminate information about available youth services: a 'home' (online or physical) for making youth aware existing of existing employment services and resources currently provided by institutions and NGOs such as career development, CV writing, scholarships, work abroad programmes. Future potential may exist to identify gaps such as affordable arts and cultural activities and develop training or other income generation opportunities.
2. Developing youth entrepreneur skills and abilities: develop short, free peer-to-peer training on marketing, cultural and leadership training, access to small loans and grants, proposal and tender writing workshops and information sessions on business licence registration.

Summary of cost-benefit analysis

- A total sum for this activity is estimated to be: **10.16 million vatu**
- Benefits generated as a part of this activity are estimated to be: **Medium/High**
- The anticipated timeline of the action is: **One to two years**

Action implementation challenges and potential strategies to address them

- Funding availability and sustainability: An online platform that is simple may be more affordable and sustainable. One staff would be required to run the online presence and could sit in the PMVC team and regularly participate in the youth employment network.
- Avoid exclusion issues: do not place restrictions on youth users. Youth from inside and outside the municipal boundary (Greater Port Vila) should be free to access the Hub.

Key partners

Chamber of Commerce and Industry, Youth Livelihoods Network (mostly NGOs), Ministry of Youth and Sports (Department of Youth), Ministry of Justice (Department of Justice and Community Services), training institutes (RTCs, TET, APTC, VIT, VITE etc.) Council of Churches, Cultural Centre, Malvatumauri, Haos Blo Hanticraft, none of whom attended the workshop where this action was developed but who might be interested in engaging in such a project.

2.5. Conclusions

In summary, three *Lines of Action* have been prioritised through a rigorous data collection and analysis process that relied upon UN-Habitat's unique City Resilience Profiling Tool methodology, which incorporated primary and secondary data sources, quantitative and qualitative analytical processes, and participatory workshops. The three *Lines of Action* not only reflect documented evidence of capacities and vulnerabilities within Port Vila but also the realpolitik for which resilience building activities take place within. There is great enthusiasm and passion within PVMC, its key partners and members of civil society for making progress in the collection and management of land and property data, improving solid waste and sanitation management and increasing youth employment opportunities. The data vacuum that exists in Port Vila was the impetus to design data collection as a first step in all three *Lines*, especially as an opportunity exists to collect additional data through ward surveys.

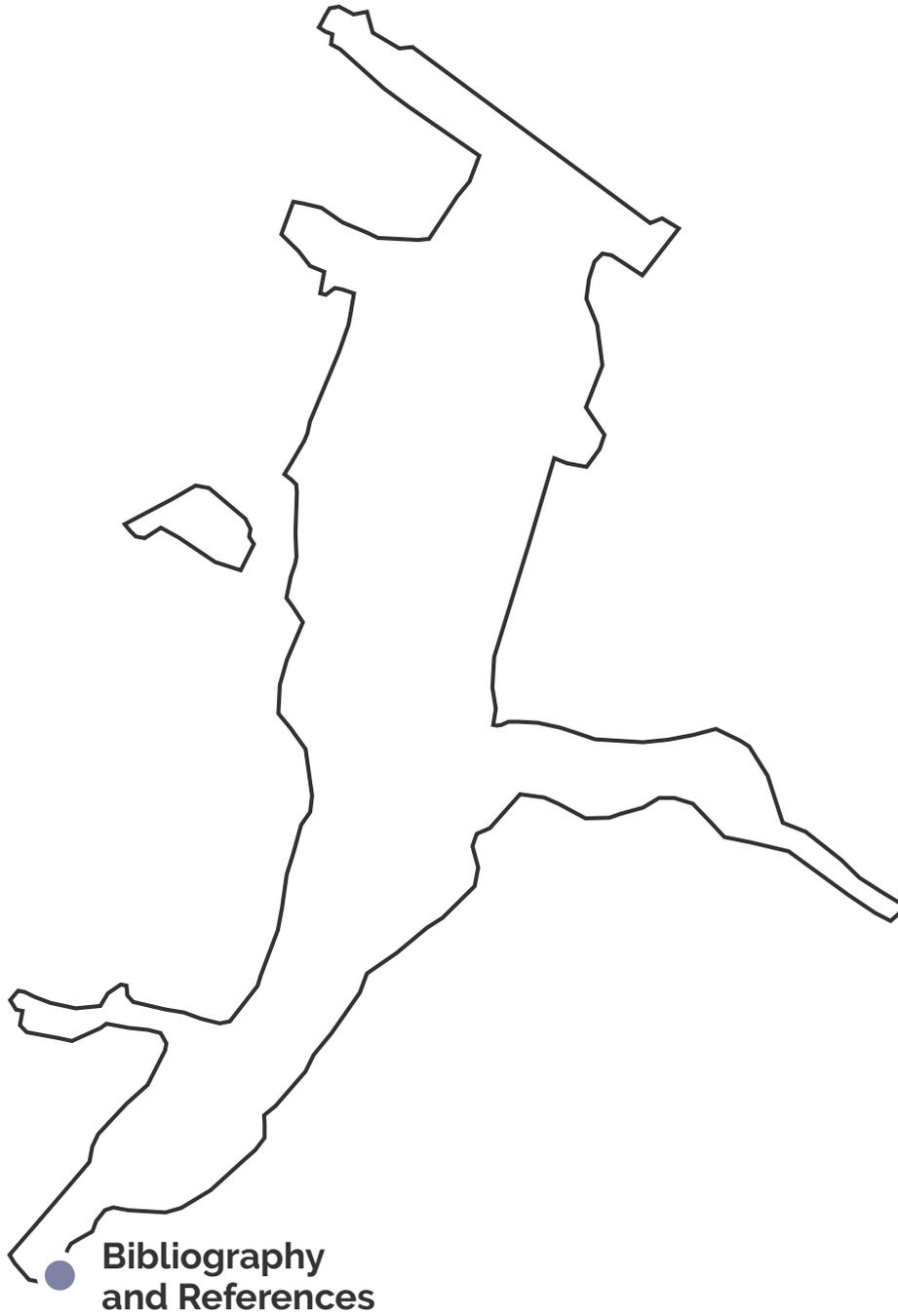
The prioritisation of coordination related activities is another common theme within the three *Lines of Action*. In the land and property data collection and management *Line*, accessibility between national, municipal and the general public is critical to progressing integrated planning, increasing tax revenue and improving public services. In solid waste and sanitation management, coordination of current activities can help identify gaps and utilise current momentum in waste management. In youth employment and economic development, the development of a "one-stop shop" for hosting workforce preparation opportunities and skills training activities is viewed as one of the best ways to coordinate existing information and host new activities as they arise.

Finally, a third theme of public awareness and communication runs through all three *Lines of Action*. In the land and property data *Line*, a need to create greater awareness and understanding of Port Vila's official municipal boundary was identified. Achieving greater clarity about the boundary may improve the accuracy of data collection undertaken by stakeholders and verification of areas where PVMC should prioritise improvement of public service provision. Moreover, communication about the official boundary allows PVMC to achieve greater public awareness on the purpose of tax collection and the services that are offered as a result. In the waste management *Line*, generating a good understanding of the public health benefits of waste management is critical to changing attitudes, behaviours and perceptions around waste disposal, especially with an education component for school children. Lastly, public awareness and communication is present in the youth employment *Line* through the plan to start an agriculture and markets network in addition to a youth workforce preparation hub. Both ideas focus on making it easier for youth to understand the opportunities that are available to them by centralising information and communicating through networks and special interest groups.

Next steps and expected outcomes

The next steps and the expected outcomes are twofold. The first step is support to PVMC on the design of survey questions related to land and property, sanitation and youth employment that can then be inserted into an existing draft of a survey intended to be implemented by PVMC imminently. The survey will be implemented in each of the five wards. The opportunity to collect data for the *Lines of Action* is unique and time bound in a narrow window. Requests for assistance from PVMC include 1.) technical expertise to support development of a limited number of strategic questions yielding the most relevant information for each line/vector and 2) assistance with data analysis and the meaningful presentation of it (for instance, the development of a short report that can be hosted online by PVMC, accessible by the Ward Secretaries and general public).

The second step is initiation of project design meetings for each of the *Lines of Action*. Such meetings could serve to brief potential project stakeholders in each *Line* on the process of the CPRT and more specifically the *Recommended Actions for Resilience and Sustainability* with the intention of identifying participants to volunteer to engage with project design. Through this approach, UN-Habitat, PVMC and other lead partner agencies can together look for longer-term funding and donor support while using existing resources to immediately instigate short-term activities.



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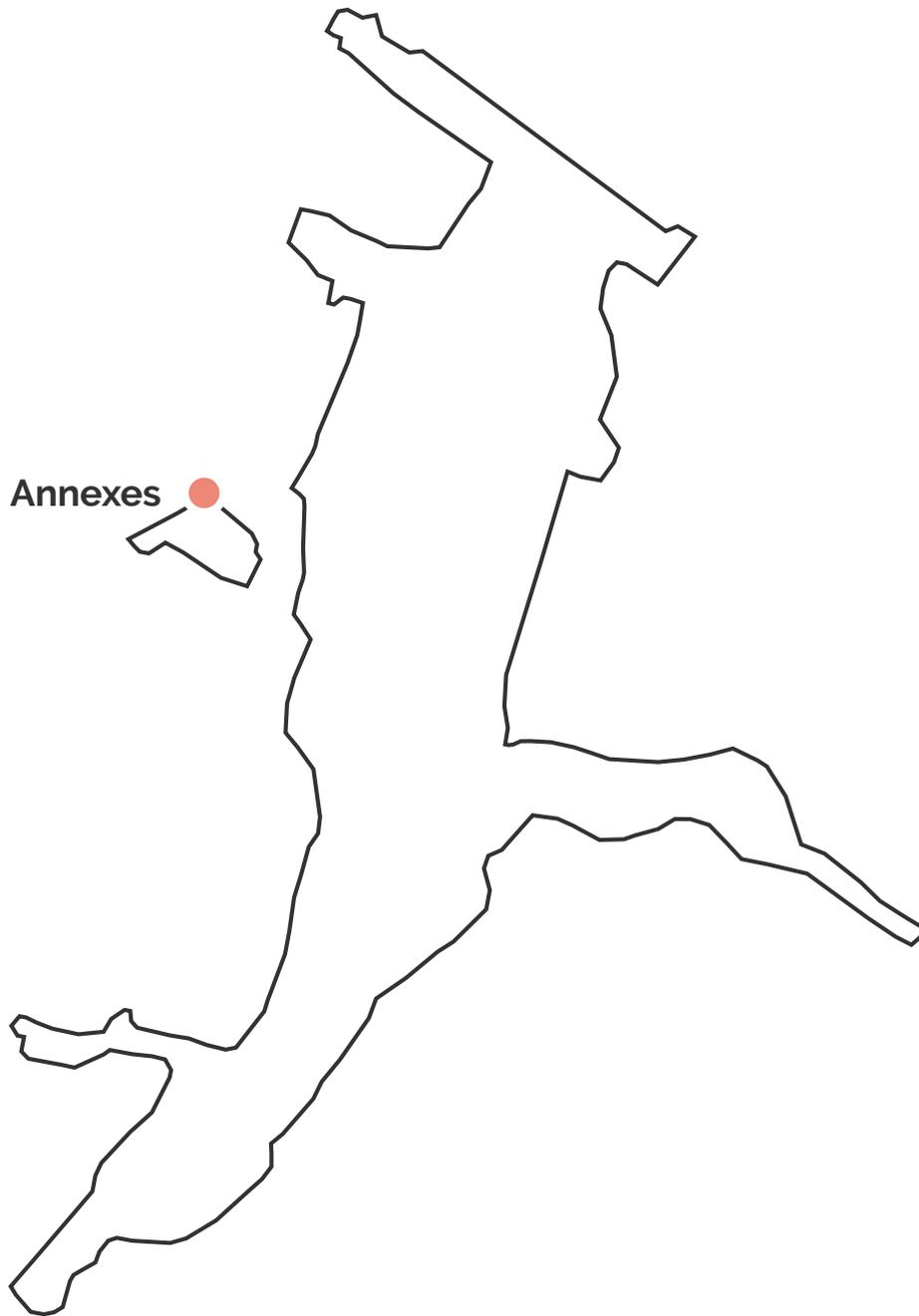
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CRPP Implementation Process in Port Vila

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Image 2 CRPP – Lord Mayor of Port Vila, Albert Sandy Daniel, and the Head of UN-Habitat’s Urban Basic Services Branch, André Dzikus. April 2017. Source: CRPP (2017).

Image 3 CRPP Analysis and Diagnosis Workshop, Port Vila, April 2019.

Image 4 Recommended Actions for Resilience and Sustainability Workshop, Port Vila, September 2019.

List of acronyms and abbreviations

RAR-S Recommended Actions for Resilience and Sustainability

BRW Barcelona Resilience Week

CRPP City Resilience Profiling Programme

CRPT City Resilience Profiling Tool

LoA Letter of Agreement

PVMC Port Vila Municipal Council

URAP Urban Resilience Asia Pacific

UN-Habitat United Nations Programme for Human Settlements

Annex I

CRPP Implementation Process in Port Vila

Description of the process in detail

The decision to implement the *City Resilience Profiling Programme* (CRPP) in Port Vila was made in 2015 shortly after Vanuatu suffered substantial damage from Tropical Cyclone Pam. However, despite official endorsement from the National Advisory Board (National Government) of the engagement with CRPP occurring in late 2017, due to programme delays, official commencement of an agreement with the Port Vila Municipal Council did not take place until the third quarter of 2018.

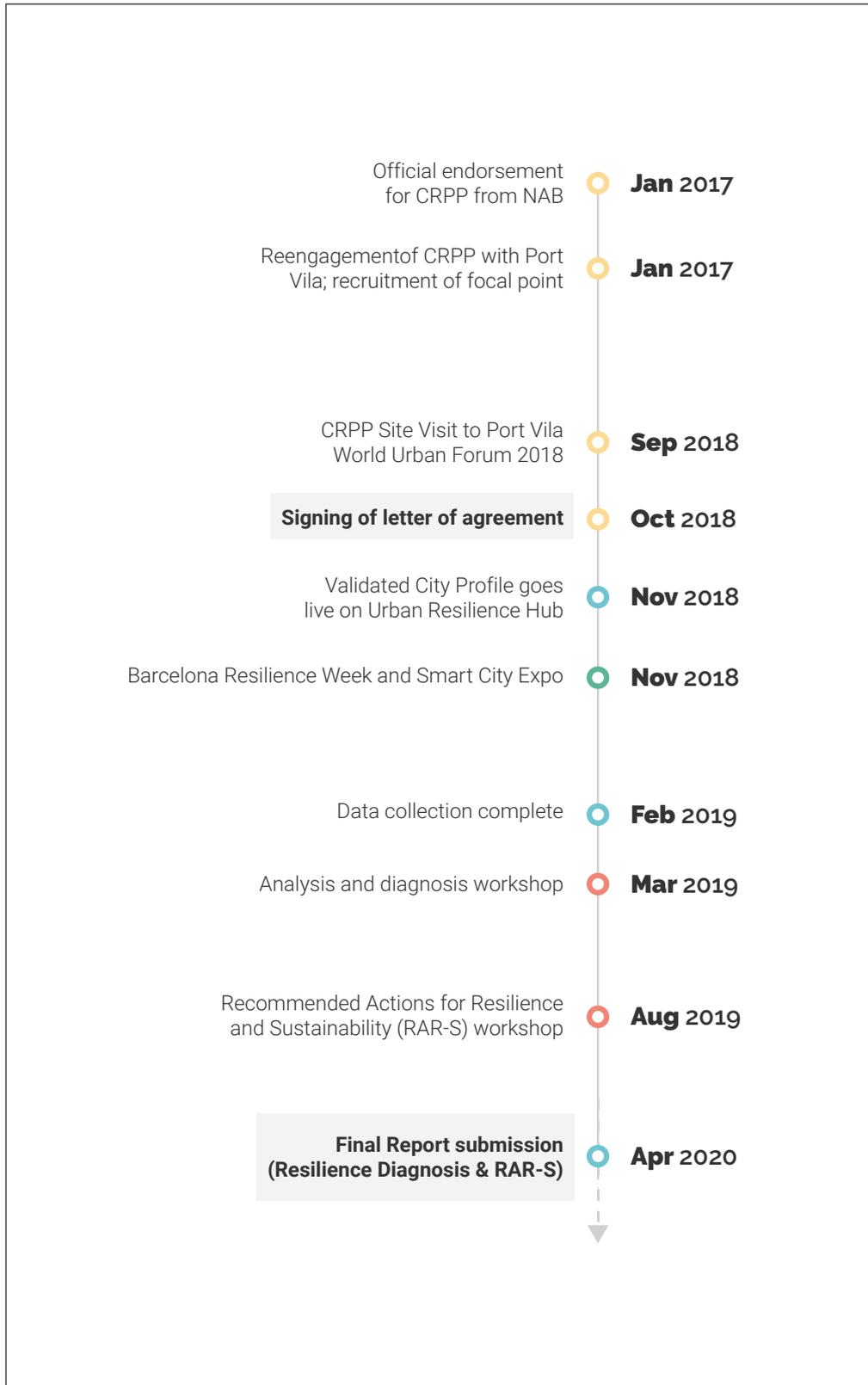
Whilst formal engagement didn't commence with the Port Vila Municipal Council (PVMC) until the fall of 2018, informal discussions and meetings had already commenced in the form of an informal meeting between the Mayor's secretary and the CRPP Focal Point. The purpose of this informal meeting was to present the CRPP to the secretary so that she could take notes and relay back initial information to the Mayor. This informal meeting was followed by a request to email the Lord Mayor with full project details. A formal invitation for partnership was developed and sent to the Mayor along with programme communication materials.

In tandem with reengagement between the PVMC and CRPP, a Focal Point was recruited to serve as the responsible party for collecting data and liaising with the PVMC. The Port Vila Focal Point, to prepare for this role, attended training on the topic of urban resilience and the CRPT, with emphasis on gathering and analysing data. In the case of Port Vila, data collection efforts were led by the Focal Point, who engaged with a variety of stakeholders from the public, private and non-profit sectors. By the end of the implementation process, the Focal Point was provided an office within the PVMC, allowing for a more direct engagement with Municipal staff and elected officials.

Relevant milestones and events

Before presenting the milestones, it is worth noting that the CRPP has worked closely with the Port Vila Municipal Council for the last year and a half to build the City's Resilience Profile and develop *Recommended Actions for Resilience and Sustainability*. In each of the milestones that are presented, no individuals are explicitly mentioned, rather the institutions involved. We thank each and every one of the participants and collaborators of the implementation process in Port Vila for their commitment and enthusiasm. The Municipality has openly accepted the implementation of the CRPP for its cross-cutting and innovative approach.

Figure 1: Timeline of CRPP Implementation Process in Port Vila. Source: CRPP (2019).



- Milestone events
- Major stages in implementation
- Other workshops / training missions
- Port Vila participation in events

January 2018 Focal Point Technical Training

The implementation process in Port Vila began with technical training of the Port Vila Focal Point. This training was conducted remotely with the CRPP technical team in Barcelona and began prior to any engagement with the local government.

September 2018 CRPP Site Visit to Port Vila

To gain partnership with the Port Vila Municipal Council, the Port Vila Focal Point was requested to present the CRPP implementation process, methodology and expected outcomes to the full Municipal Council for approval. The presentation was a brief summary outlining the composition of the CRPP, how the City Resilience Profiling Tool would be utilised in Port Vila, how *Recommended Actions for Resilience and Sustainability* would be developed. The presentation ended with a formal invitation to partner. The acting Town Clerk also provided a supporting speech in favour of implementation. Following the presentations, all counsellors voted in favour of partnering with UN-Habitat.

July 2018 Approval of the Port Vila Municipal Council for the implementation of CRPP

The first site visit was made by the technical back-stop to Port Vila who sits in the CRPP office in Barcelona. A small presentation was made to a select group of personnel from PVMC. This initial visit provided opportunities for introductions between key stakeholders both within and outside of the PVMC as well as for more in-depth training, data collection, and contextual analysis for CRPP team members.

September 2018 Presentation of Progress in Port Vila during Urban Resilience Asia Pacific

The Port Vila focal point was invited to attend the Urban Resilience Asia Pacific (URAP) forum in Sydney to present the CRPP methodology and process in Port Vila. The presentation included an introduction to the City Resilience Profiling Tool (CRPT) and the opportunities engagement with CRPP could provide for cities. The presentation was followed by an open discussion on how the CRPP and CRPT can be applied in additional Pacific contexts. Presenting at the URAP conference supported a much wider exposure to the Asia Pacific region.

November 2018

First Official PVMC Mission to Barcelona for the Signature of the Cooperation Agreement with UN-Habitat, and Barcelona Resilience Week (BRW)

The Honourable Lord Mayor of Port Vila, Albert Sandy Daniel, and the Head of UN-Habitat's Urban Basic Services Branch, André Dzikus, signed a Letter of Agreement (LoA) on Monday 12 November, 2018 to implement in Port Vila the CRPT. The signing of the agreement coincided with the Lord Mayor's participation in the Barcelona Resilience Week and the Smart City Expo World Congress, both of which took place in Barcelona during the week of 12 November.

The Agreement aims to promote urban resilience in the Municipality of Port Vila, understanding it as the capacity of the urban system to resist and recover quickly from any possible crisis and danger and to maintain the continuity of its activities and services.

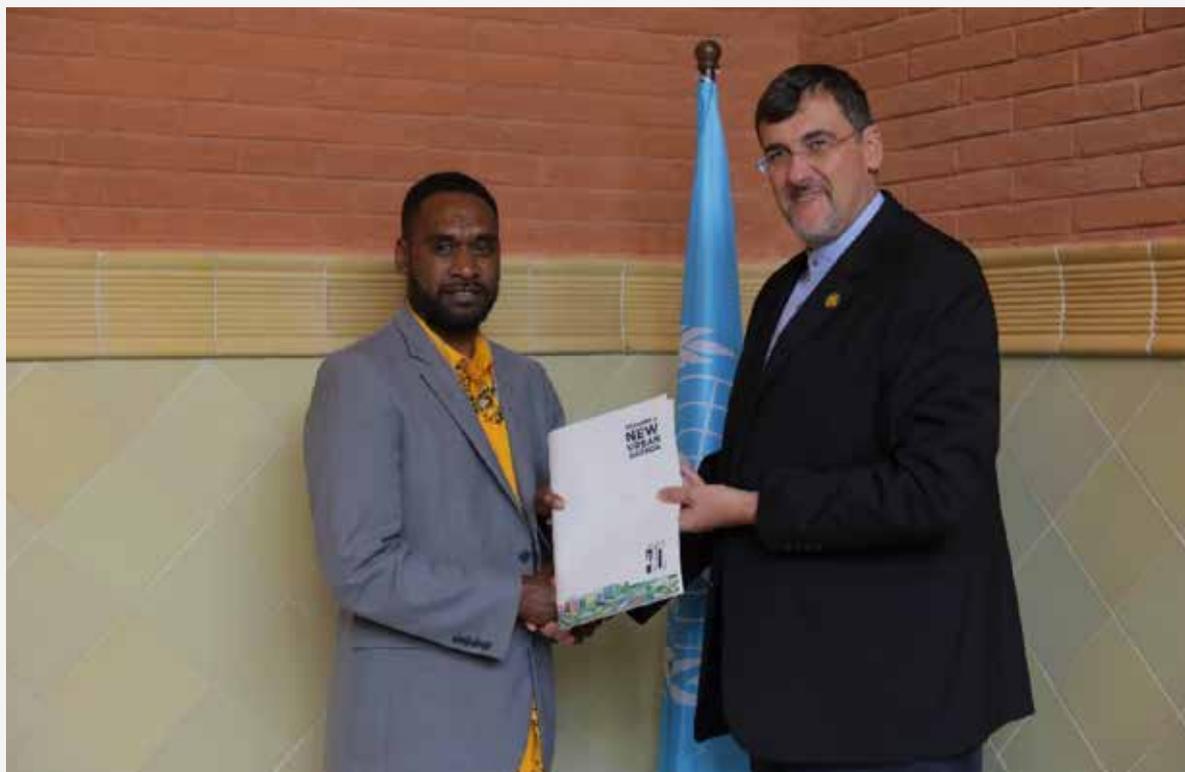


Image 1: CRPP – Lord Mayor of Port Vila, Albert Sandy Daniel, and the Head of UN-Habitat's Urban Basic Services Branch, André Dzikus. November 2018. Source: CRPP (2018).

April 2019 Second Technical Mission in Port Vila: Analysis and Diagnosis Workshop

The second technical mission to Port Vila was centred around the first of two formal workshops included in the implementation methodology: the Analysis and Diagnostic Workshop. The workshop took place in Port Vila on the 1st and 2nd April, 2019 and was intended to both collaboratively assess evidence gathered by UN-Habitat regarding factors that create *stresses* within the city and the city's capacity for dealing with those *stresses*.



Image 2: Analysis and Diagnosis Workshop in Port Vila. April 2019, Source: CRPP (2019).

August 2019 Third Technical Mission in Port Vila: Recommended Actions for Resilience and Sustainability Workshop

The third and final technical mission to Port Vila included a workshop held to develop *Recommended Actions for Resilience and Sustainability*. The purpose of the workshop was to work with a select group of people with knowledge on particular subjects central to the actions pursued by the CRPP team to review existing policies and projects, discuss potential barriers (political realities, capacity limitations, existing initiatives, etc.), and identify potential partners to engage with in implementing UN-Habitat's recommended actions in an effort to build resilience in Port Vila.



Image 3: Recommended Actions for Resilience and Sustainability Workshop in Port Vila. September 2019. Source: CRPP.(2019).

March/April 2020**Completion of Recommended Actions for Resilience and Sustainability (RAR-S)
Report and Presentation to the PVMC**

The complete report detailing the results of CRPP's implementation process in Port Vila became available for dissemination in early 2020. A corresponding presentation of high-level findings will be given to the Port Vila Municipal Council by the CRPP Focal Point in the first or second quarter of 2020.

City Characterisation

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Annex II

City Characterisation

1. City Context and History

Formerly known as the New Hebrides, Vanuatu was jointly governed by British and French administrations in 1906, then attaining independence on 30 July 1980 joining the Commonwealth Nations, making Port Vila the nation's capital city. Port Vila now serves as Vanuatu's administrative and economic centre, largest city, and location for its most prominent educational institutions.



Figure 1 : Port Vila's Geographic Isolation.

Foundation of the City

While the area occupied by Port Vila has been inhabited by indigenous Melanesians for thousands of years, beginning in the early 17th century, the archipelago that is now called Vanuatu was colonised by various European powers including the Portuguese, French and British. Initially overshadowed by the port of Havannah, located on the northern coast of the island of Efate, by the 19th century, the area that is now Port Vila began to assume greater economic importance. The current incarnation of Port Vila was largely shaped by a handful of historical events occurring in the second half of the 20th century:

Region:	South Pacific
Country:	Vanuatu
Coordinates:	17.7333° S, 168.3273° E
Time:	UTC +11
Port Vila Urban Area:	24.3km ²

Vanuatu becomes a tax haven

Beginning in the 1970s, Vanuatu was established as an international tax haven, giving rise to a construction boom and expansion of financial services as a proportion of the local economy. Another consequence of Vanuatu's tax status relates to commercial shipping registration. Today, numerous merchant vessels and international shipping companies utilise Vanuatu's open-registry shipping, better known also as "flag-of-convenience registry, in order to enjoy the tax benefits and benign regulations of Vanuatu nationality.

Expansion and modernisation of the port and wharf in Vila Harbour

Sparked in part by a boom in the global price of nickel in the 1970s and transformation of Vanuatu's economy following its tax status modification, the expansion of the wharf and modernisation of the port led to Port Vila's emerging role as a tourist destination and solidified its importance to the country's economy.

Vanuatu gains independence

After a unified government was established in 1978 and new constitution providing the path to independence was passed in 1979, the Vanuatu archipelago formally gained independence in July 1980 and joined the Commonwealth of Nations.

Function of the City

The naturally protected Mele Bay and Vila Harbour was originally utilised for fishing and other local-serving commercial activities. Beginning in the 1880s, the colonial centre of the archipelago now called Vanuatu (formerly New Hebrides) moved from Havannah to Port Vila following a series of malaria outbreaks and coastal flooding. The relatively minimal colonial commercial interests in the region were based in Port Vila, spurring continued use of the natural harbour and expanding agricultural activity in the surrounding area.

Beginning in the 1970s, following the establishment of Vanuatu as an international tax haven, Port Vila experienced a building boom and corresponding expansion and modernisation of its port and wharf. These economic changes led to the expansion of the tourism industry, continued importance of the commercial port, and rapid growth in population over the following decades. Port Vila now serves as the most important harbour and commercial centre in Vanuatu.

Port Vila key data	
Total urban footprint:	24.3km
Altitude:	59m
Köppen-Geiger Climate classification system:	Tropical rainforest
Highest recorded temperature:	37.2 degrees
Average annual rainfall:	1500 - 4000 millimetres annual rainfall
Population:	84,895 Greater Port Vila estimate (VNSO 2014)
Population density:	84,895 / 24.3km ² = Approx. 3,500 persons/km ²
Population average age:	23 (2016; Urban Areas)
Average household size:	4.8
Average household income:	37,600vt per month (USD 352)
Religion (%)	Predominately (over 90%) Christian
Life expectancy (years):	75.4 (2017; Vanuatu)
Languages (%)	Bislama, French, and English
Mortality rate (%)	4/1,000 (2017; Vanuatu)
Literacy rate (%):	98% (2009; <i>Economic Census</i>)

Table 1: Key Geographical, Climatic and Socioeconomic Data for Port Vila. Source: CRPP (2019).



Figure 2: City of Port Vila.

2. Spatial Dimension

Port Vila is located within the South Pacific Convergence Zone, within the cyclone belt and approximately 50km east of the New Hebrides Trench, an active source of tectonic events that continue to trigger major earthquakes and tsunamis. Port Vila and its surrounding area possesses a diverse geological composition and wealth of exploitable natural resources. The shallow coastal areas abutting Port Vila provide access to marine materials, food products, and natural assets generating tourism-driven economic activity.

Climate

Port Vila is characterised by a two-season tropical climate, experiencing relatively mild annual average temperatures year-round. During the dry season (May-October) minimum and maximum temperatures average 20.1°C and 26.8°C respectively, while during wet season months (November-April) temperatures are slightly higher and average 22.7°C and 29.7°C, respectively. Port Vila's climate is classified as tropical rainforest or equatorial (Köppen climate classification: Af).

The city experiences heavy rainfall and high humidity throughout the year, though inter-annual rainfall exhibits significant variability. Historically, roughly two thirds of Port Vila's approximately 1500-4000mm of annual rainfall has fallen within the wet season with rainfall usually peaking in March (average precipitation of 321mm/month) and reaching its nadir in September (87mm/month average).

Ecosystems

Port Vila is located on the south-west coast of the island of Efate, one of approximately 82 islands that comprise the Y-shaped archipelago in the South Pacific. Given the coastal location of the city, it is situated within both marine and coastal ecosystems. Within the land boundaries of Port Vila, the ecosystems have been altered significantly since the area was originally settled due to fairly intensive agricultural production.

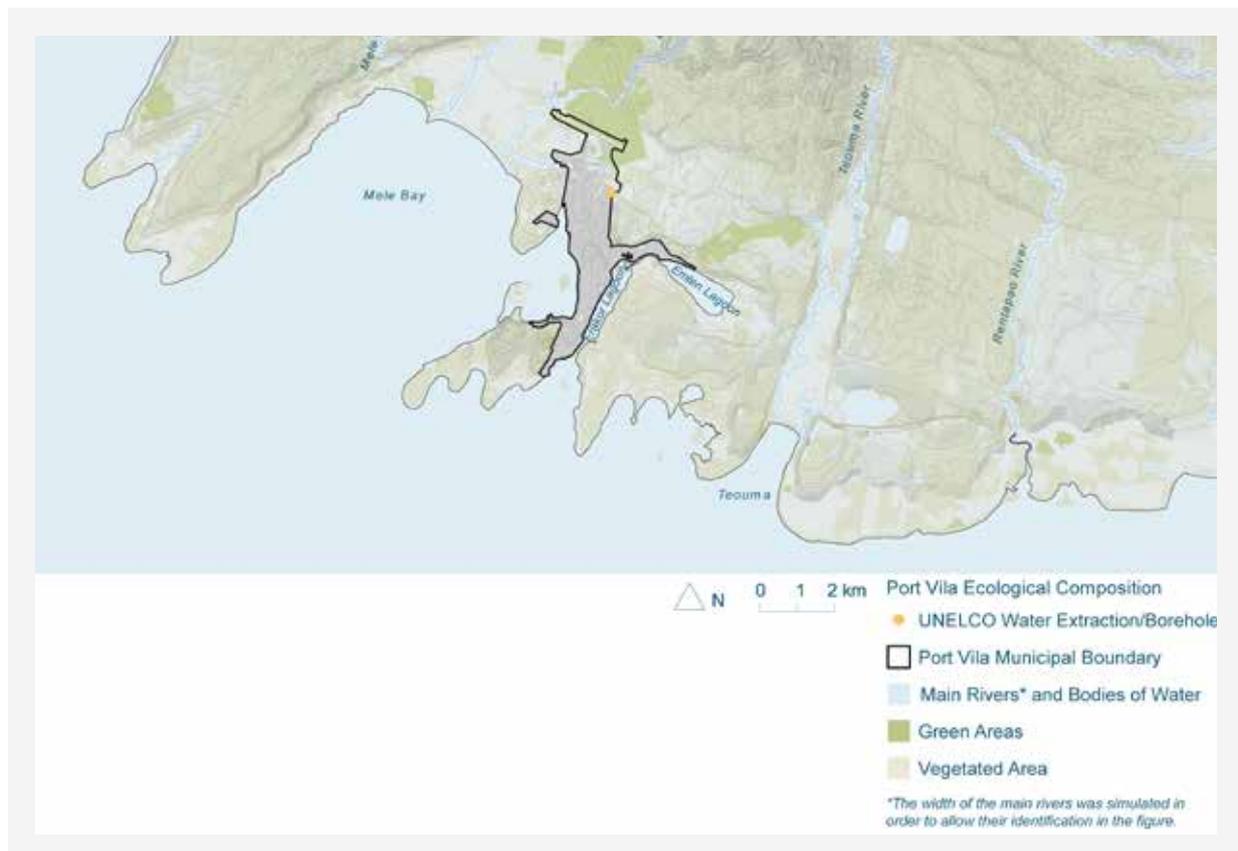


Figure 3: Greater Port Vila Ecological Composition.

The water catchment is located north of the city centre and east of the airport, where land use is intended to be restricted to non-intensive agricultural uses. However, enforcement has been inconsistent leading to sporadic housing development in recent years.

On the eastern edge of the municipal boundaries exist two lagoons (Erakor and Emten), which contain brackish mangrove and sea grass ecosystems that maintain low levels of salinity due to the lagoons' location within the intertidal zone.

The coastal marine ecosystem surrounding the city includes extensive reef fisheries, providing an important local food source, feature for tourism, and location for resident recreation. The coastal marine ecosystem also supports the primary inter-island trade and transportation routes.

Climate type:	Tropical rainforest
Altitude:	59m
Highest recorded temperature:	37.2 degrees
Precipitation:	1500 - 4000 millimetres annual rainfall

Water Provision

The provision of drinking water to Port Vila is the responsibility of the private firm UNELCO, which relies primarily on surface source collected from nearby catchments. Contamination by human and animal excrement remains an issue due to the lack of source protection as well as from wastewater runoff during floods or heavy rainfall. The Ministry of Health (MoH) is responsible for water quality surveillance of all water supply systems.

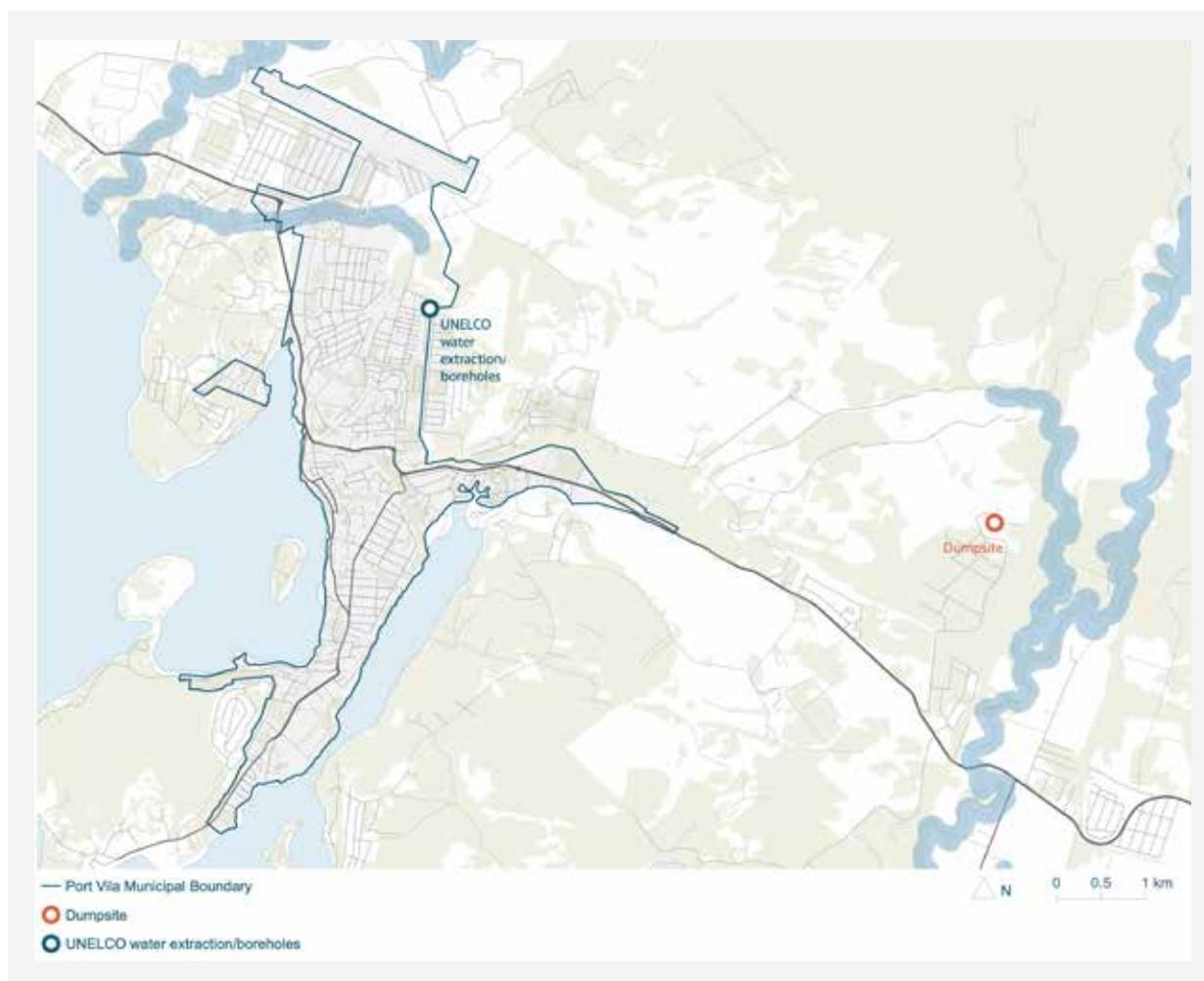


Figure 4: Port Vila Water Extraction.

Power

Over 80% of all electricity generated in Port Vila is from diesel fuel, which is imported by the Pacific Petroleum Company and brought by tankers from Australia or Singapore. The country's renewable energy sources (solar and wind generation) are substantial, although not yet utilized according to its potential. The average price for household customers in the current concession areas is 54.55 Vatu per kWh, which equals 59 USD cents. For consumers with a demand below 60kWh currently pay 18.89 Vatu/kWh or 20 USD cents.

The electricity market in Vanuatu currently consists of two vertically integrated companies, which in their respective concession areas carry out all electricity generation, transmission, and distribution, supply, and customer services. In Port Vila power is supplied by Union Electrique du Vanuatu Limited (UNELCO). In 2012, the Government of Vanuatu initiated the "Energy Roadmap" intended to adapt energy generation to rely more on renewable sources and limit reliance on diesel-based electricity generation.

Wastewater Treatment

Currently in Port Vila there is no wastewater treatment. The city of Port Vila relies on individual septic tank system for wastewater. In comparison to rural areas, the proportion of households in urban areas with access to improved toilet facilities is much higher.

Urban Area

Surrounding Vila Harbour and set around a series of natural lagoons, beaches, and a series of islands, Port Vila continues to expand beyond its municipal boundaries, mainly to the north and east of the city centre.

Estimates suggest that roughly half of the approximately 24.3 km² of the greater Port Vila urban footprint are within the administrative boundaries. Moreover, many of the fastest growing areas of Port Vila are located in these peri-urban zones, in areas characterised as either containing informal settlements (e.g. Blacksands) or areas that began as informal settlements but have subsequently been formalised through land tenure agreements (e.g. Melcoffe and Freshwota). The majority of this peri-urban growth is being accommodated through single-story, detached housing expansion into open space/formally agricultural land, with the exception of some key infill sites closer to the city centre.

All land rights within the Port Vila municipality were acquired from customary ownership by the State following Vanuatu's Independence in 1980. Therefore, all land within Port Vila continues to be owned by the State and leased to private entities and individuals through long-term land leases, a process which is overseen by the Department of Lands. Outside of the municipal boundaries, wherein the majority of the rapidly growing peri-urban informal settlement is located, land remains under customary ownership.

Total urban footprint:	24.3km ²
Land tenure types:	Urban Lease (42%), Rural Lease (20%), Customary (19%), Occupation with Informal Arrangement (18%), Other (1%).
Housing tenure types:	Ownership (46%), Rental (44%), Rent Free/Squatting (9%), Other (1%).
Housing typologies:	Single-family and limited unit multifamily. Avg. dwelling unit is > 10 years old.
Household size:	4.8
Main public transport modes:	Bus

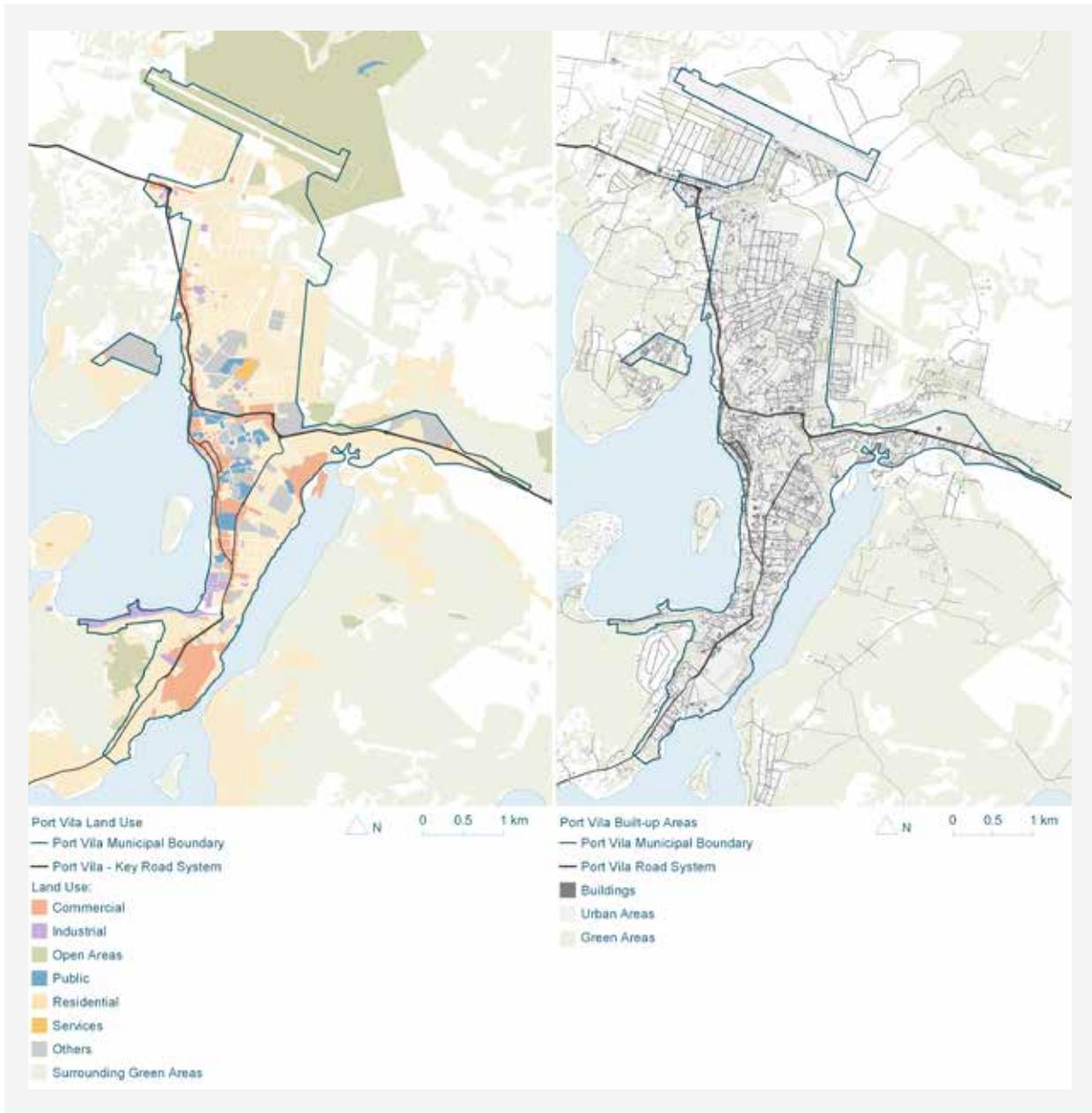


Figure 5: Port Vila Municipal Boundaries and Land Uses. Source: CRPP based on PVMC GIS data and Google Maps data (2019).

Physical Assets

While Port Vila is the largest city in Vanuatu and serves as its administrative and commercial centre, it remains relatively small in terms of population, scale of urban area, and corresponding infrastructure. Despite its size, Port Vila possesses a number of important physical assets including the Bauerfield International Airport, Central Hospital, a campus of the University of the South Pacific, and an active commercial port which processes nearly 90 percent of the country's imports.

Port Vila retains its historic commercial centre, along with a few scattered historic residential neighbourhoods. The urban area is connected by a number of primary and secondary roads as well as water transportation utilised for commerce, tourism, and daily life. Due to the importance of tourism in Port Vila, the city and surrounding area is home to numerous hotels, and resorts.

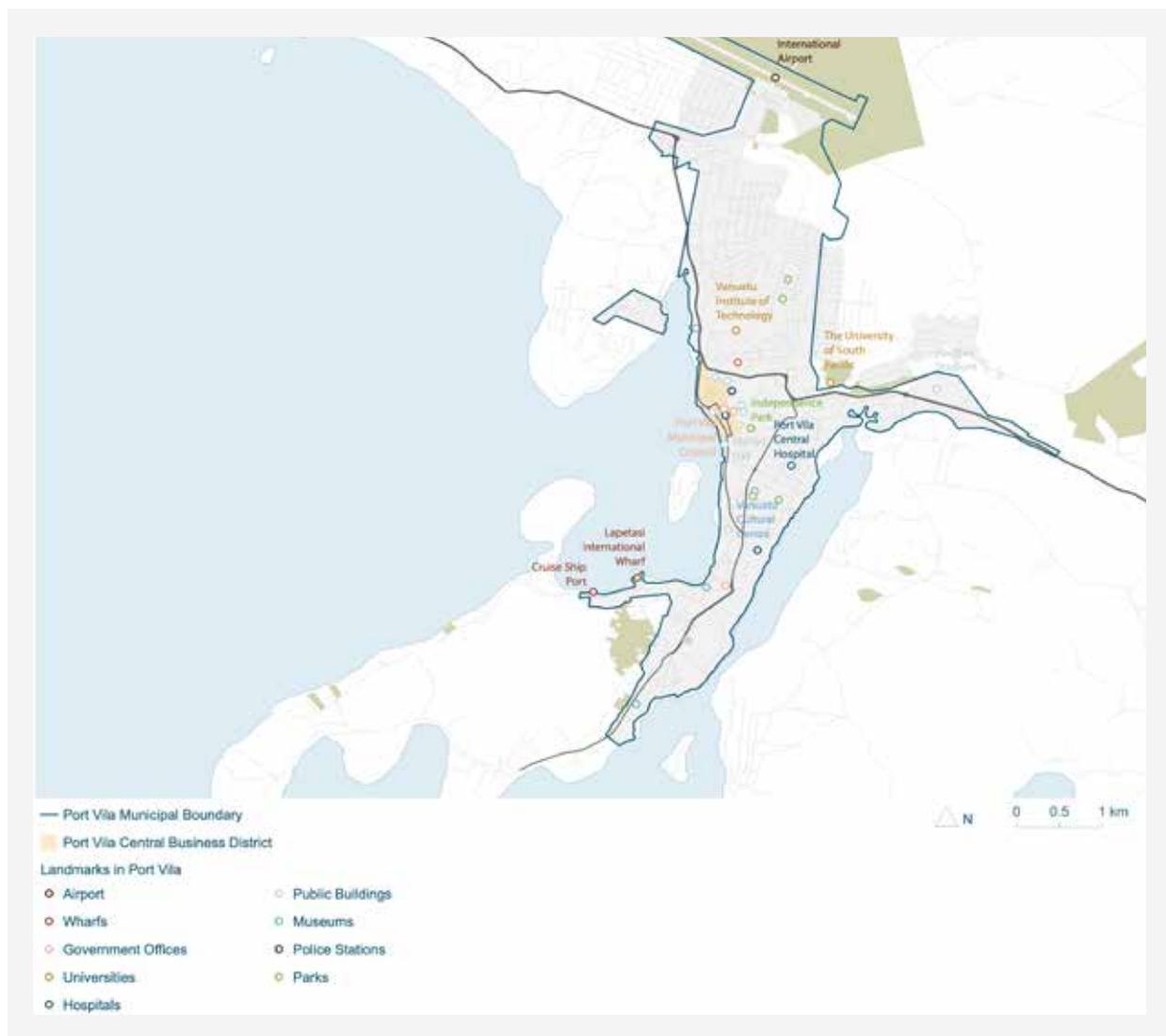


Figure 6: Port Vila Landmarks and Critical Facilities.

The effects of Tropical Cyclone Pam can still be seen in certain areas of the city, but recent efforts by the local and national governments, in collaboration with international partners, is working to address specific vulnerabilities in local infrastructure and buildings. Both the Vanuatu Infrastructure Reconstruction and Improvement Project, approved in 2016, and the Vanuatu Aviation Investment Project, approved in 2015, are notable initiatives directly addressing deficiencies in infrastructure and prioritising repairs to schools, and government buildings, among other civic structures.

3. Population and Demographics

The last national census in Vanuatu was conducted in 2016 and found the country's population to be 272,500, an increase of over 15 percent from 2009. Of this total, approximately 51 percent were men and 49 percent were women. The median age in Vanuatu is 20, whereas in urban areas such as Port Vila, the figure is slightly higher at around 23.

Approximately 2 percent of Port Vila's population identifies with an ethnic group aside from Melanesian, with a similar figure reflecting inhabitants that are not Ni Vanuatu nationals.

Population

Based on the most recent national census, Port Vila has a population of approximately 51,500 and accounts for nearly 20 percent of the country's total population. While the city experienced rapid growth between 1999 and 2009, increasing its population by over 50 percent, recent estimates indicate a slightly reduced growth rate over the past decade, a trend believed to stem, at least in part, from economic effects following the global financial crises in 2008, but also due to geo-spatial and socio-economic realities.

Recent population growth has been concentrated on the periphery of the city, particularly east along the Teouma corridor and west of the airport in the Mele Flats. These areas have experienced rapid residential expansion due in large part to affordable transportation access to the city centre and low rents. A 2014 estimate by the Vanuatu National Statistics Office found the population of Greater Port Vila to be nearly 85,000, indicating nearly 40 percent of the urban area's population resides outside of the administrative boundaries.

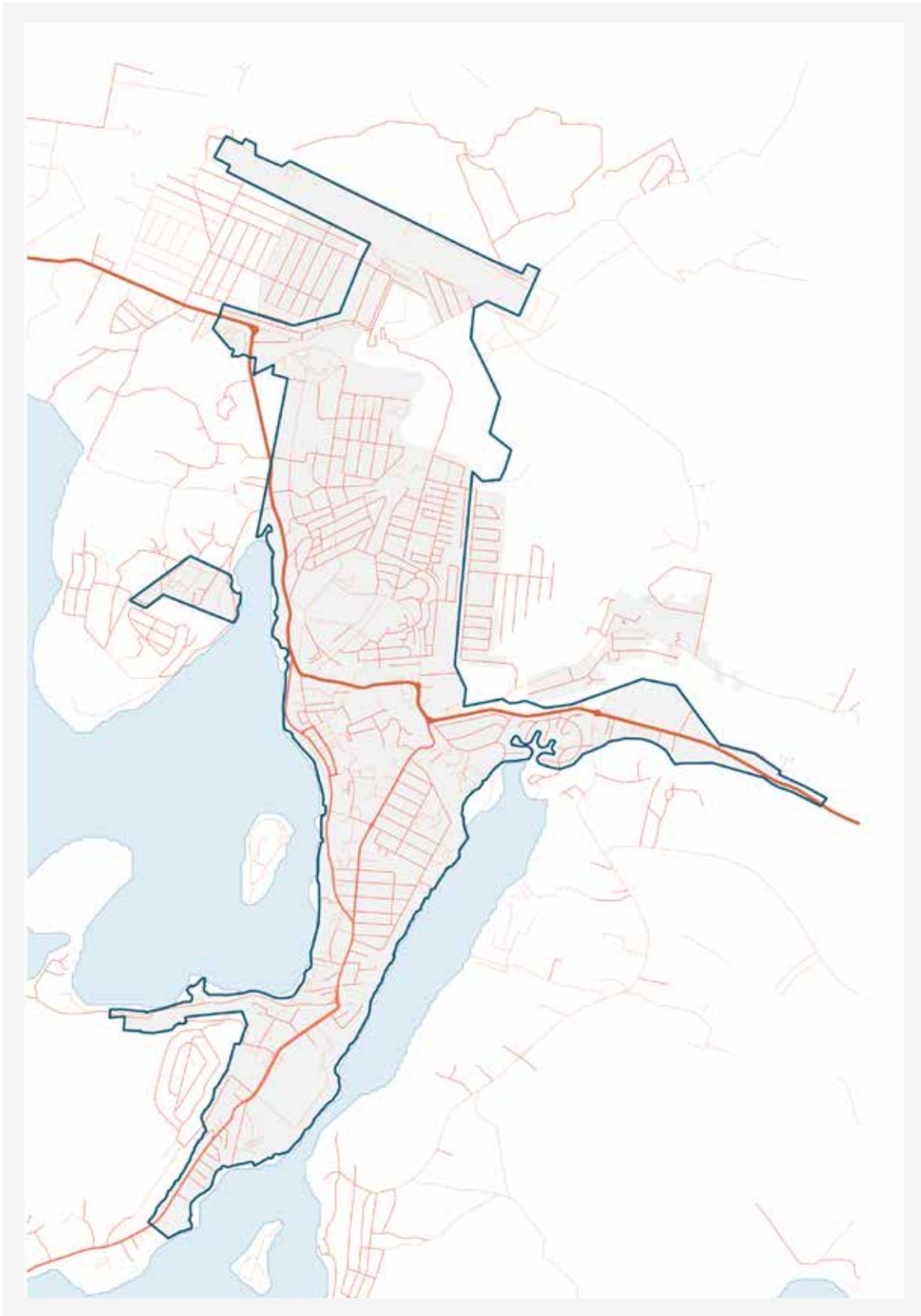
Population Size:	84,895 Greater Port Vila estimate (VNSO 2014)
Population Density:	84,895 / 24.3km ² = approximately 3,500 persons/km ²
Population Age:	23 (2016; figure reflects 'urban areas')
Life Expectancy:	75.4 (2017)
Ethnic and/or National Groups:	predominately Melanesian, with small Polynesian, Asian, Australian and European populations, mainly French and British
Religions:	Predominately (over 90%) Christian
Languages:	Bislama, French, and English
Literacy Rate:	98% (2009; VNSO)
Mortality Rate:	4/1,000 (2016)
Infant Mortality Rate:	14.4/1,000 (2017)

Household Information

There are approximately 11,000 households in Port Vila, the majority of which reside in single family detached dwellings (61 percent). The average household size in Port Vila is 4.7 slightly below the national average. Household size is estimated to increase slightly in the peri-urban neighbourhoods and decrease slightly in the city centre, consistent with income trends.

Approximately 50 percent of all urban households in Vanuatu were found to not have access to improved sanitation in the Mini Census (VNSO 2016). A slightly lower figure is assumed for Port Vila.

Figure 7: Port Vila Road System. Source: CRPP 2019.



- Port Vila Municipal Boundary
- Urban areas
- Port Vila Road System. Source: OSM, 2019
- Primary
- Secondary
- Tertiary
- Residential
- Others (cycleways, footways, paths, unclassified roads)

△ N 0 0.5 1 km

4. Economy and Livelihoods

In 2016, Vanuatu had an estimated GDP of USD 807 million. The nation's economy is composed primarily by agricultural production, resource extraction, and services related to tourism and the financial sector.

In the rural areas of the country, the sale of fish, crops and handicrafts remain the most common means of income, whereas urban centres such as Port Vila rely more heavily on wage-based income derived from service-sector work related to tourism and the public sector. The *2009 Economic Census* (VNSO 2009) found nearly 80 percent of Port Vila households rely on wage-based income as their primary source of income.

The Port Vila 2016 *Gross City Product*, calculated based on employment ratios, is estimated to be approximately USD 320 million, or 40 percent of the national total. Despite the prominence of Port Vila in the national economy, a far greater proportion of Port Vila residents are unable to meet their basic needs (18.4%) than rural Vanuatu residents (10%). Furthermore, the depth of poverty in Port Vila is found to be nearly double that for populations living outside of urban centres.

National Economy and Urban Economy

Vanuatu GDP per capita of approximately USD 3,000 ranks 148th out of 184 analysed countries according to the Massachusetts Institute of Technology's (MIT) OEC Atlas. According to 2015 estimates, Vanuatu imports nearly USD 328 million worth of goods and services, exporting only USD 133 million of goods and services, resulting in a negative trade balance of nearly USD 200 million, or about 25 percent of GDP.

The country's largest export products are non-filet frozen fish, meat, and high value agricultural products such as kava, copra, vanilla, cocoa beans and sandalwood. Major imports include transportation, fuel (particularly refined petroleum and diesel), machinery, and foodstuffs. Major trading partners include China, Australia, New Zealand, as well as nearby Fiji.

This trade-dependent economic composition is not uncommon with island nations. Like most other Pacific Island States, Vanuatu has no fossil fuel resources in its territory, thus has to import all fuel for mobile or stationary use. The lack of natural resources and manufacturing available locally requires extensive importation of energy, machinery, household goods, and other high-value products and services. However, the limited existence of value-added industries suggests potential economic development opportunities, especially in Port Vila.



Image 1: Port Vila Public Market. Source: Shutterstock.



Figure 8: Connectivity with Major Trading Partners. Source: Data informing analysis derived from the MIT Atlas of Economic Complexity as well as local knowledge; mapping designed by CRPP team.

Income

While median household income in Port Vila exceeds that in most other areas of Vanuatu, the city suffers from more significant inequality. The last *Economic Census* (VNSO 2009) found that the lowest quintile of earners in Port Vila earned less than the lowest quintile in other parts of the country, despite much higher costs of living in urban areas. The median income per individual in Port Vila is estimated to be 37,600 vatu or approximately USD 352 per month. These figures have likely increased over the last 9 years, however, given structural economic dynamics have not significantly changed over that period, income distribution is likely to remain reasonable aligned with past findings.

Over a quarter of all households in Port Vila are either dependent on, or supported by, the direct sale of goods. The most common goods sold are found to be cash crops (most prominently kava), manufactured items (e.g. baskets), and fruits and vegetables. Direct sales are most often conducted by women and occur predominately in public markets, affirming the importance of markets to the local Port Vila economy. It should be noted that important analyses have been conducted by UN Women on how to effectively increase resilience to climate change through an examination and bolstering of market operations.

National Gross Domestic Product:	USD 807 million
Local Gross Domestic Product:	USD 320 million
National Import and Export Ratio:	USD 133 million/ USD 328 million = .41
Median Income:	37,600vt per month (USD 352)
National Poverty Line:	2,866vt per month per person (UNDP 2010); Approximately USD 27
Unemployment Rate:	12% in urban areas (2009 VNSO)

5. Local Government and Public Administration

Administrative Structure

The politics of Vanuatu take place within the framework of a Parliamentary democracy political system which is currently headed by the President who has primarily ceremonial powers and who is elected for a 5-year term by a two-third majority of an electoral college. This Electoral College consists of Members of Parliament and the Presidents of Regional Councils. The Prime Minister who is head of government, is elected by a majority vote of three-fourths quorum of the Parliament. The Prime Minister in turn, appoints the Council of Ministers, whose numbers may not exceed a quarter of the number of Parliamentary representatives. The Prime Minister and the Council of Ministers constitute the executive Government.

The national Council of Chiefs, called the Malvatumauri are composed of custom chiefs elected by their peers. The Malvatumauri advises the Parliament on all matters relating to custom and tradition and may make recommendations for preservation and promotion of ni-Vanuatu culture and languages. Besides national authorities and figures, Vanuatu also has high-placed people at the local level as chiefs continue to be the leading figures in villages and communities. By tradition, Custom chiefs exercise customary authority within local communities and the Malvatumauri have a constitutional role at village, island and provincial levels.

Local Government Organisational Structure and Characteristics

The Republic of Vanuatu is composed of six provinces: Malampa, Penama, Sanma, Shefa, Tafea and Torba. Each province is administered by a provincial council in addition to which there are three Municipal councils for the cities of Port Vila (Shefa), Luganville (Sanma), and Lenakal (Tafea). The Department of Local Authorities within the Ministry of Internal Affairs is responsible for overseeing local government.

Formally established in 1980, Port Vila Municipal Council holds jurisdiction over the formal Municipal area of the city, as legislated under the Municipalities Act, Cap. 126. The Municipality is governed by 17 representatives spread across five wards; ward councils were set up in July 2014, and comprise of representatives from the Council of Chiefs, the Vanuatu National Women's Council, Church Groups, Youth Organisations and the Disabled Persons Association of Vanuatu. Councils are elected through an open constituency system for a term of four years, each ward elects two representatives who in turn will elect the mayor. The newly elected Lord Mayor Daniel Sandy Albert is the 16th Mayor to be elected in the floors of the Council Chambers.

The Municipal Administration has revenue-raising powers, but also oversees transfers received from the national government. The Administration is responsible for the control, management and administration of the municipality. Specific competencies include safeguarding public health, handling primary education, developing, controlling and managing land taken on lease from any statutory land authority including any housing estates thereon, managing refuse collection and disposal, overseeing cemeteries, maintenance of local roads, parks and open spaces, and the promotion of tourism.



Figure 9: Port Vila Ward Boundaries.

6. Hazards and Challenges

Port Vila faces extensive environmental threats, evident in its recent ranking as the “world's most exposed city to natural disasters.” Such environmental threats, many of which are linked to the impacts of climate change, are exacerbated by existence of impoverished people, limited economic opportunity, and tenuous connectivity to external markets.

Common Description on Crisis and Description of Challenges

Due to its geographical, climatic, and spatial context—the city is located within the South Pacific Convergence Zone (SPCZ), placing it within the Pacific cyclone belt and on a very active tectonic plate boundary, and it is also part of the ‘Ring of Fire’, a chain of volcanoes that are located on the edge of the Pacific Plate—Port Vila is exposed to a variety of natural hazards of varying severity. These environmental hazards include, but are not limited to, tropical cyclones/severe storms, earthquakes, tsunamis, extreme rainfall, localized flooding, drought, coastal erosion, sea level rise, ocean acidification.

Significant Crisis

While Port Vila has long been exposed to natural shocks, its continued growth, industrialization, and urbanization, coupled with climate-related increases in hazard intensity, has resulted in devastating events. A strong offshore earthquake caused widespread damage to the town and surrounding area in January 2002 and in March 2015 Tropical Cyclone Pam, the most powerful cyclone ever recorded to make landfall in Vanuatu, devastated the town once again – with 90 percent of all buildings in Port Vila damaged or destroyed, 30 percent of the country's population being left homeless, and decimating nearly 90 percent of all subsistence crops, on which a large proportion of the population depends.

Natural Hazards:	Earthquake, Extreme Rainfall, Tropical Cyclones, Drought, Seal-level Rise, Ocean Acidification
Time period of crisis:	November to May (cyclones)
Main issues:	Limited infrastructure and services, limited access to credit

Challenges

Based on the analyses conducted by international actors working on resilience in Port Vila, it is possible to identify two main, interconnected strands of urban challenges. One challenge relates to the extensive variety and magnitude of environmental threats, coupled with, and exacerbated by, the contingent impacts of climate change. The other is derived from the degree to which the city remains simultaneously isolated from, and dependent on, external markets; structural vulnerabilities that are compounded by continued economic transition away from subsistence-based agricultural activities and towards low-value export products and tourism.

The two strands of challenges are categorised below into three environmental threats and one, multifaceted economic/social threat. It should be noted that these threats often overlap and/or compound one another, as was the case in 2015 when Tropical Cyclone Pam was preceded by a mere two weeks by both a volcanic eruption and an earthquake.

¹ Verisk Maplecroft (2015). Natural Hazards Risk Atlas. Extracted from www.maplecroft.com/ 8 October 2019

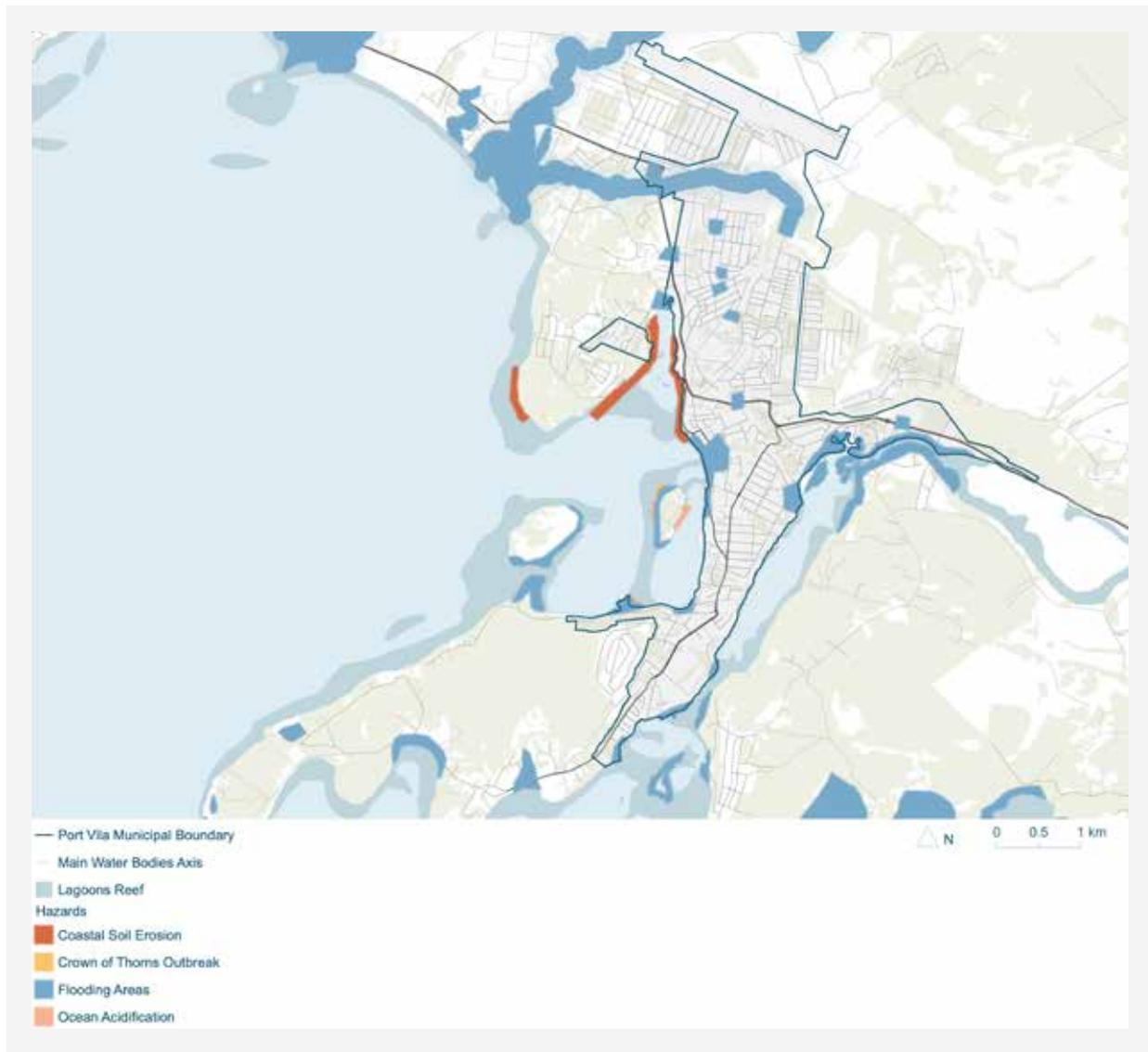


Figure 10: Location of Key Hazards in and Around Port Vila.

Earthquakes, and volcanic activity

The Vanuatu archipelago is located within the New Hebrides Subduction Zone where the Australian and Pacific Plates overlap. Volcanic activity is present in the area, which can also trigger tsunami wave action events. Seismic events are often connected to liquefaction and landslides. Small seismic events are commonly recorded in Port Vila with larger events having occurred every 5-10 years over the past quarter century.

Extreme rainfall and flash flooding

Flash flooding around Port Vila is predominantly driven by lack of effective drainage, therefore localised flooding can occur even with average rainfall, and is not restricted to severe storm events of prolonged wet periods. However, there is a high frequency and intensity of extreme 1-in-20-year rainfall events, and frequency of such events is expected to increase in the coming decades. Specifically, the intensity of these extreme rainfall events is projected to increase by approximately 8-9 mm under both very low (RCP 2.6) and high (RCP 8.5) emissions scenarios by 2030, while by 2090 a high emissions scenario is projected to increase the intensity of heavy daily rainfall events by 40 mm. Along with flash flooding, Port Vila experiences coastal and river flooding. While coastal and river flooding is more likely to occur during cyclone seasons or la Niña years, with the former exacerbated by sea-level rise, localised flash flooding can occur following average rains.

Cyclones

Port Vila is located within the South Pacific Convergence Zone (SPCZ) and within the Pacific cyclone belt. In 2015, Vanuatu was severely damaged by Tropical Cyclone Pam, which was recorded as the second most intense tropical storm in the Pacific Ocean in terms of sustained winds and is regarded as one of the worst natural disasters ever experienced in Vanuatu. The storm took the lives of between 11 and 16 people and displaced thousands, crippled the archipelagos infrastructure (in particular its cellular and electrical grid), and destroyed an estimated 90 percent of the country's crops. Vanuatu is exposed to an estimated 2.4 cyclones per year with 1 per year being classified as severe.

Wave action including tsunami and storm surge

Sea-level rise compounds an already vulnerable environment that is subject to some natural subsidence as well as tectonic activity and shoreline changes with successive earthquakes and tsunamis. Vanuatu is prone to tsunamis and these have in recent years caused loss of life and property damage. According to data from the SEAFRAME gauging station, seven tsunamis were recorded in Port Vila between 1993 and 2006

Drought

(Related to El Niño) - El Niño brings with it prolonged dry season resulting in drought. Whilst it would be difficult predicting droughts or its intensity, a predicted occurrence of El Niño is an indication that drought is eminent. Wet season rainfall provides the majority of water supplies to the smaller islands of Vanuatu. However, El Niño conditions in this part of the Pacific can shift rainfall patterns, causing significant decrease in rainfall and leading to drought conditions, causing significant declines in agricultural productivity and exports to Port Vila, which the majority of the population rely upon. More frequent El Niño events could increase the intensity and occurrence of droughts, with important implications for disaster management in Vanuatu

Sea-level rise, coastal erosion

While less susceptible to sea level rise than nearby Kiribati, sea-level rise in Vanuatu is exacerbated by the advent of climate change and hydro-meteorological hazards. Moreover, as Port Vila is located on a tectonically active area, vertical land movements cause the island of Efate to 'sink' at a rate of approximately 4 mm per year, thus roughly doubling sea-level rise impacts.

Ocean acidification

Ocean acidification and warming are immediate threats to Vanuatu's marine ecosystems and coral reefs, which underpin Port Vila's tourism economy, as well as being the source of a range of traditional food and material products. Ocean acidification directly causes damage to coral reefs and fisheries, including depletion of fish stocks. Under both high (RCP 8.5) and medium (RCP 4.5) emissions scenarios, coral reef health will reach marginal conditions (as measured by aragonite saturation state dropping below 3.5) at some point between 2020 and 2030. Even under a low emissions scenario (RCP 2.6), it is possible that this threshold will be reached by 2040. In addition to the threat represented by acidification, warming of the ocean increases the risk of coral bleaching events.

Health hazards

As with other Pacific Island nations, Vanuatu's public health sector is vulnerable to climate variability and change, particularly with regard to the increased incidences of nutritional deficiencies, and diarrheal and vector borne diseases. Outbreaks of many diseases, including conjunctivitis, are common during droughts. Limited information is available on the extent and frequency of any health issues, let alone on those with a significant link to climate variability and change. However, increased temperatures, projected flooding, and anecdotal evidence on reduced water quality point to a potentially deteriorating condition in the health sector under a changing climate.

Food and fuel crisis: economic isolation and dependence

As discussed briefly in the Economy & Livelihood section, Port Vila, and Vanuatu more generally, maintains a large trade imbalance and lacks local economic complexity. Port Vila's dependence on imported fuel, high-value goods, food, and tourism leaves it vulnerable to economic reverberations in the global market. Such vulnerabilities are especially acute regarding global energy and staple food costs as Port Vila must rely both on international shipping, diesel fuel, and many components of daily dietary needs. Therefore, a regional or global economic crisis, or energy or food market volatilities, may cause extensive damage to the local Port Vila economy and those who depend upon it.

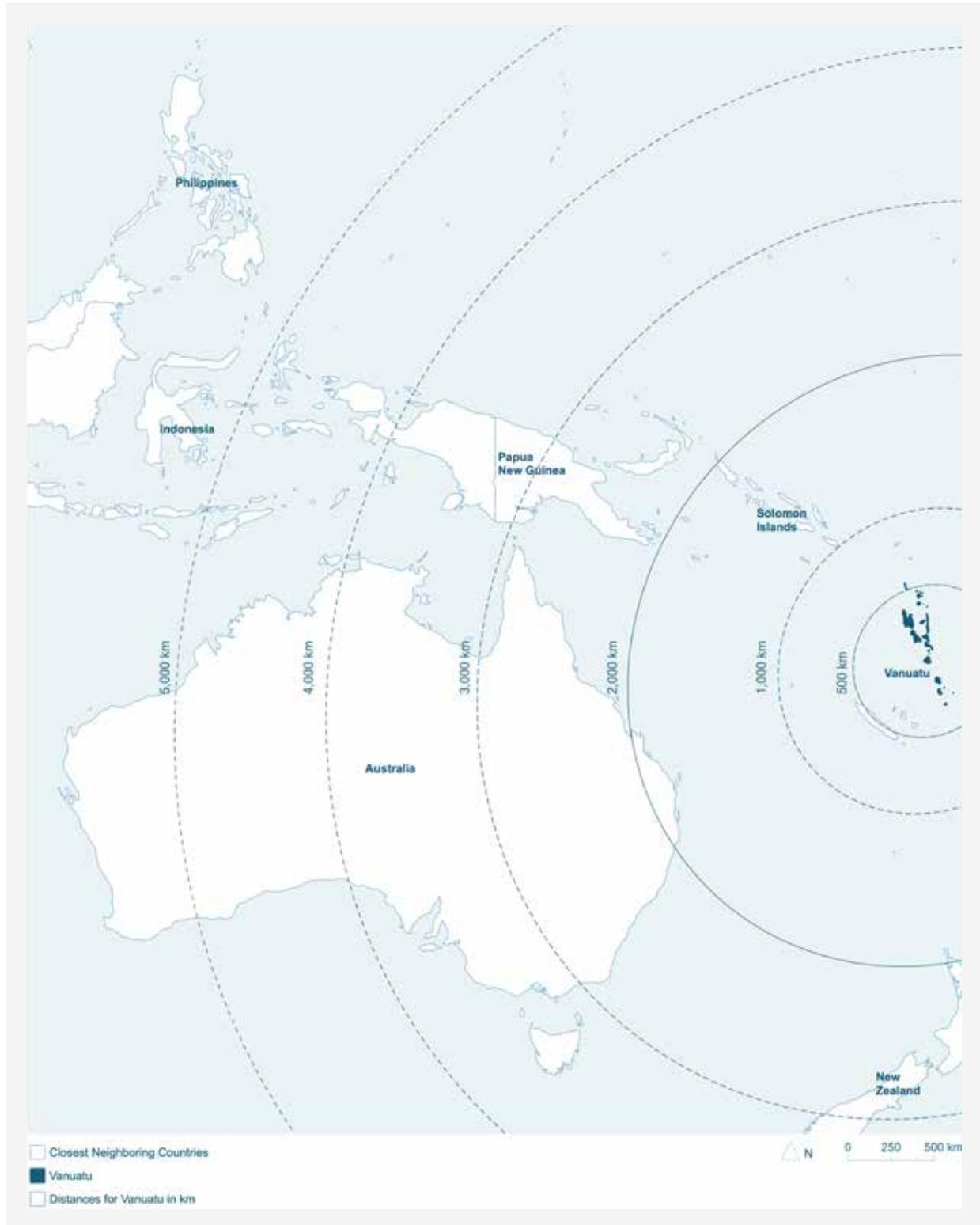


Figure 11: Geographic Isolation of Port Vila.

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List of acronyms and abbreviations

BEN	Built Environment
BIN	Basic Infrastructure
CO2	Carbon Dioxide
CRPP	City Resilience Profiling Programme
CRPT	City Resilience Profiling Tool
CSO	Civil society organizations
DEPC	Department of Environmental Protection & Conservation
DFAT	Australian Department of Foreign Affairs and Trade
DLA	Department of Local Authorities
ECL	Ecology
ECN	Economy
GDP	Gross Domestic Product
IDB	Inter-American Development Bank
IVRM	Comprehensive assessment of water sources Index
JICA	Japanese International Cooperation Agency
LGBTI	Lesbian, gay, bisexual, transgender, and intersex movement
MADES	Ministry of Environment and Sustainable Development
MIA	Ministry of Internal Affairs
MoH	Ministry of Health
MOB	Mobility
MOPC	Ministry of Public Works and Communications
MPS	Municipal Public Services
NEET	Young person who is not studying or working
NCD	Non-Communicable Diseases
PVMC	Port Vila Municipal Council
RCP	Representative Concentration Pathway
SCL	Supply Chain Logistics
SIP	Social Inclusion and Protection
SPREP	Pacific Regional Environment Programme

List of acronyms and abbreviations

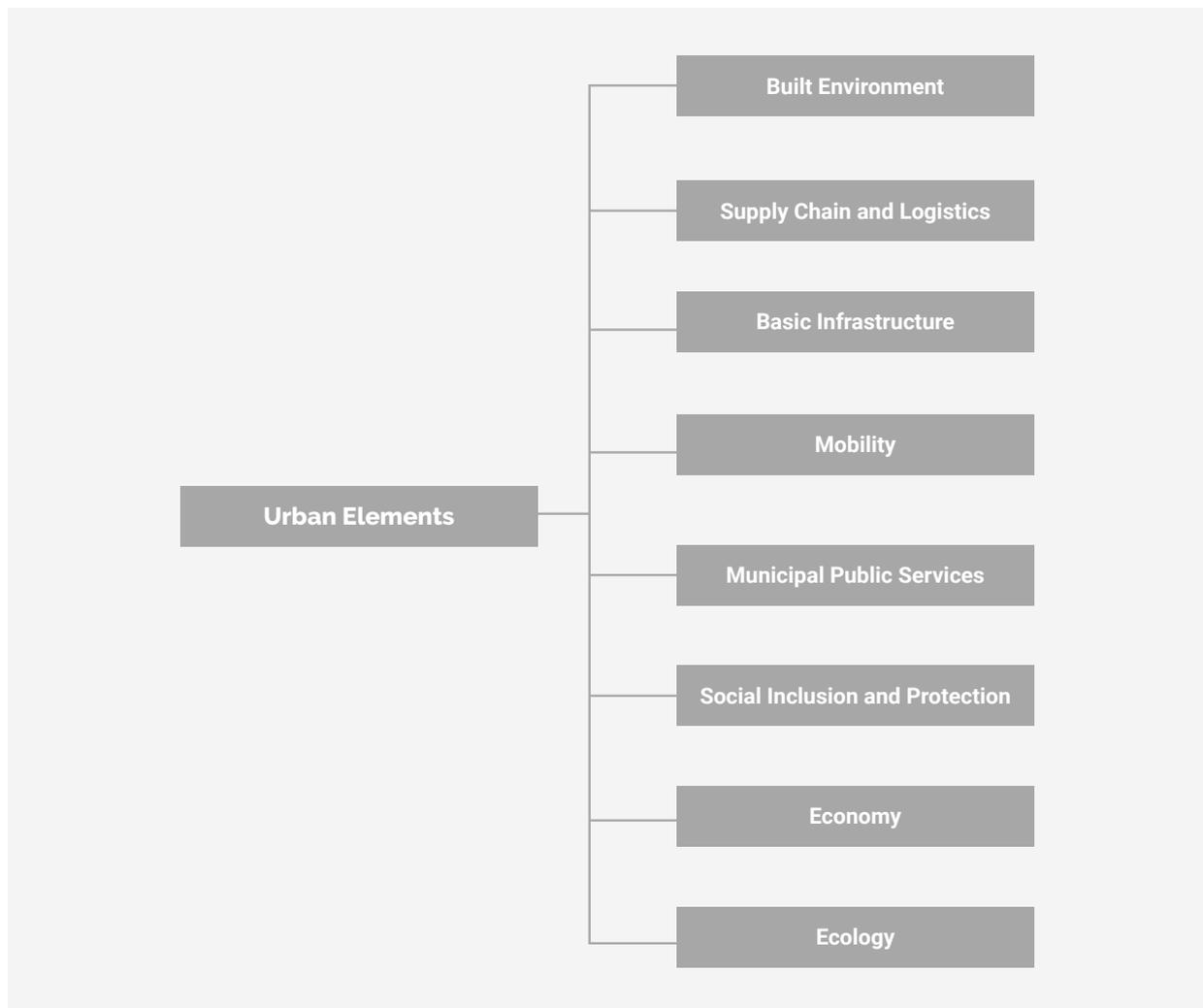
SPCZ	South Pacific Convergence Zone
TRR	Telecommunications and Radio-Communications Regulator
UNDP	United Nations Development Programme
UNELCO	Union Electrique du Vanuatu Limited
VNSO	Vanuatu National Statistical Office
WB	World Bank

Annex III

General Review of the Urban Performance

Introduction

This section provides a high-level overview of the data collected, benchmarked, analysed, and distilled into key findings for each of the eight *Urban Elements* that comprise the urban system's performance. In addition, key information that is not directly collected through indicators and *related questions* but provides critical information for better understanding certain complex urban dynamics, is presented herein primarily as a means to further contextualize data findings for each city.



Element overviews are intended to provide a high-level snapshot, not comprehensive analyses. Consequently, all identified vulnerabilities, capacities, and data-related complications are not presented in these overviews. Key findings should therefore be understood as data-borne highlights that have been extracted because they are indicative of common trends identified in more exhaustive data analyses.

Each *element* overview is comprised of seven sections:

1. Element description:

A brief explanation of the scope of the *element* and its *component* composition.

2. Key Contextual Information:

Narrative description of the city which includes key information that may not have been directly collected through the urban *element* data collection, stakeholders mapping, or the identification of key *policies, plans, and initiatives (PPI)*.

3. Data Collection Assessment:

Summation of data collection completion results, overview of data completion by component, and key findings suggested by data completion. Completion is calculated using three categories: *complete*, *alternative*, and *not available*. *Complete* refers to data sufficient for calculating a benchmark; *alternative* refers to data insufficient for calculating a benchmark but nonetheless beneficial for the analysis; and *not available* refers to data that was not collected.

4. Benchmark Assessment:

Broken into brief summaries of each component, provides a high-level assessment of the performance of an *element* based on quantitative measurement of the data collected against established benchmarks. Benchmarks range from 'green' (indicating positive performance or potential capacity) to 'red' (indicating poor performance and potential vulnerability). indicators that have been informed by qualitative reading, such as through alternative data, are also included in the assessment.

5. Cross-cutting Issues:

For each *Urban Element*, a summary is provided illustrating the extent to which completed *supporting indicators* and *related questions* align with selected cross-cutting issues (Climate Action, Gender Equality, Informality, and Poor Infrastructure) as well as each issues' sub-categories. In addition, throughout the Element Overview, alignment with cross-cutting issues for specific questions is illustrating using representative icons. Note that for certain questions, more than one cross-cutting issue may be aligned.

Cross-cutting Issue	Sub-category	Sub-category Description
 Climate Action	CA-1	Climate data
	CA-2	Environmental quality data
	CA-3	Urban climate resilience data
	CA-4	Resource efficiency data
 Gender Equality	GS	Gender specific questions
	SD	Sex disaggregated data
 Informality	Direct	Questions directly indicating informality
	Indirect	Questions indirectly indicating informality
 Poor Infrastructure	Soft	Indicators relating to 'soft' aspects of infrastructure
	Hard	Indicators relating to 'hard' aspects of infrastructure

6. Analytical summary by component:

A narrative explanation of the performance of each *component* is presented. This narrative includes a table *component-specific* table, organised by benchmark results, summarising the city's performance.

7. Key Findings:

Executive summary of key takeaways related to all available data. Findings may relate to data collection, performance, contextual factors, or some combination.

Built Environment

The *Built Environment Element* analyses information that spans the urban footprint and its growth and composition, then proceeds to delve deeper into the aspects of land tenure, housing and built assets.

Key Contextual Information

Surrounding Port Vila Harbour and set around a series of natural lagoons, beaches, and a series of islands, Port Vila continues to expand beyond its municipal boundaries, mainly to the north and east of the city centre. The coastal marine ecosystems surrounding the city provide a vital source of food, a feature for local tourism businesses and a recreational resource for residents, as well as providing the main routes for inter-island trade and transport. The urban area is connected by a number of primary and secondary roads as well as water transportation utilised for commerce, tourism, and daily life. Due to the importance of tourism in Port Vila, the city and surrounding area is home to numerous hotels and resorts. All land rights within the Port Vila Municipality were acquired from customary ownership by the State following Vanuatu's Independence in 1980. Therefore, all land within Port Vila continues to be owned by the State and leased to private entities and individuals through long-term land leases, a process which is overseen by the Department of Lands. While Port Vila is the largest city in Vanuatu and serves as its administrative and commercial centre, it remains relatively small in terms of population, scale of urban area, and corresponding infrastructure. Despite its size, Port Vila possesses a number of important physical assets including the Port Vila Bauerfield International Airport, Central Hospital, a campus of the University of the South Pacific, the National Vanuatu Museum, and an active commercial port which processes nearly 90 percent of the country's imports. There are approximately 11,000 households in Port Vila, the majority of which reside in single family detached dwellings (61 percent). The average household size in Port Vila is 4.7, slightly below the national average.

Rapid urban growth, especially in the peri-urban areas, is outstripping the capacity of the governmental entities (local, regional, and national) to ensure adequate environmental services of safe water supply, sanitation, and solid waste collection.

Data Collection Assessment

Data collection efforts for Built Environment resulted in a total completion rate of 77%, with an additional 5% *Alternative* data. The majority of data collected was primarily derived from four main sources - *Greater Port Vila: Ecosystem and socio-economic resilience analysis and mapping*¹, *Urban Growth Trends Report Port Vila: Risk Mapping and Planning for Urban Preparedness*², and the *Urban Risk Management Strategy - Risk Mapping and Planning for Urban Preparedness*³. The largest data collection challenge faced related to the definition of boundaries used in each report and plan. The legal boundary stated by the Port Vila Municipal Council (PVMC) is not that which the National Census uses, or that of other external consultants (such as Beca International Consultants Ltd). This presented challenges in identifying where vulnerabilities exist.

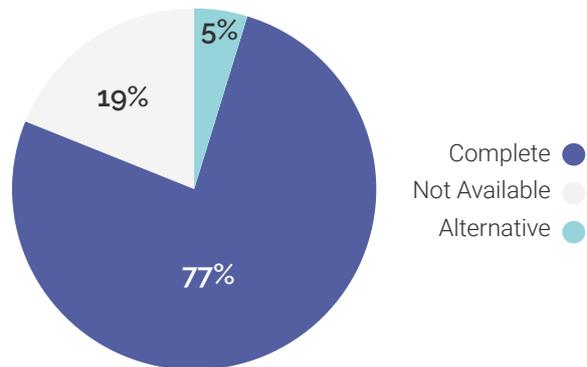


Figure 1: Data Collection Assessment (Built Environment).
Source: CRPP (2019).

¹ McEvoy, D. et al. (2017). *Greater Port Vila. Social Mapping and Analysis of Ecosystem Use*. Apia: SPREP.

² Beca International Consultants (Beca) and GNS Science and the National Institute of Water and Atmospheric Research (NIWA). (2016). *Urban Risk Management Strategy: Risk Mapping and Planning for Urban Preparedness*. Online: Beca and NIWA.

³ Government of Vanuatu. (2016). *Vanuatu Meteorological and Geo-hazards Department*.

Benchmark Assessment

The pie chart below illustrates the capacities (identified by 'green' and 'yellow' benchmarks) and vulnerabilities (identified are indicated by 'red' and 'orange' benchmarks) for the *Built Environment Element* as a whole. For each *component*, a short narrative description is supported by a table highlighting the benchmark assessment in greater detail.

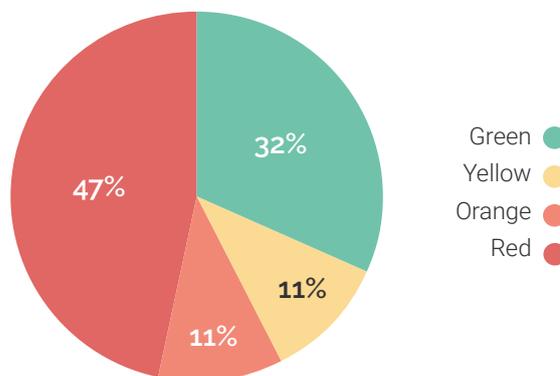


Figure 2: Benchmark Assessment (Built Environment).
Source: CRPP (2019).

Cross-Cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)	CA-3 (7) CA-4 (4)	SD (3) GS (1)	Indirect (5) Direct (6)	Soft (5)	Hard (6)

The *Built Environment Element* possesses considerable alignment with cross-cutting issues as illustrated by the table above. The *element* greatly informs all four of the selected cross-cutting issues, with particular representation with Climate Action, Informality and Poor Infrastructure. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

 www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Urban Form

The table below highlights the capacities identified in Port Vila in regard to *Urban Form*, highlighted by 'green' and 'yellow' benchmarks. The table also identifies vulnerabilities that impact urban form in Port Vila, highlighted by 'red' benchmarks.

Urban Form		Cross-cutting issue(s)			
Urban Form Capacities and vulnerabilities	(CA)	(GE)	(I)	(PI)	
Questions that received a green benchmark					
1.1.1.1	Land consumption rate to population growth rate in the past 10 to 15 years				
		CA-4			
Questions that received a yellow benchmark					
1.1.2.5	Percentage of population living within 400 meters to public open space (Please disaggregate by sex, age and groups in vulnerable situations, if possible)				
			SD		
Questions that received an orange benchmark					
	None				
Questions that received a red benchmark					
1.1.1.2	Percentage of urban footprint located in hazardous areas				
		CA-3	Indirect	Hard	
1.1.2	Open areas and street layout				
1.1.2.1	Percentage of open areas within the urban footprint				

One 'green' and one 'yellow' benchmark have been allocated within *Urban Form*. The 'green' benchmark identifies that Port Vila's land consumption rate to population growth rate in the past 10 to 15 years (1.1.1.1) is a positive trend of 1.37. This analysis and other related points shared below were calculated based on data from a report proposed by ESRAM in 2016. Overall however, there was a lack of geospatial data and corresponding population data about Port Vila with the last census data being collected in 2009, warranting a limited ability to accurately depict the current dynamics seen in Port Vila today.

The 'yellow' benchmark was assigned based on a key informant interview with the Town Planning Department whereby it was estimated that approximately 75 percent of the population is living within 400 meters to public open space (1.1.2.5).

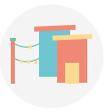
There were no 'orange' benchmarks allocated to *Urban Form*. However, there were three 'red' benchmarks indicating significant vulnerabilities that could put populations at risk. The first 'red' benchmark was assigned based on the finding that 85 percent of the urban footprint is located in hazardous areas (1.1.1.2). A 2016 report entitled, *Urban Risk Management Strategy - Risk Mapping and Planning for Urban Preparedness*, found that Port Vila is most at risk from earthquakes and strong wind and flooding. The study outlines Port Vila's urban footprint and identifies risk areas over a 100-year period. It concludes that approximately 85 percent of the city's buildings will have a moderate level of exposure to disaster risk while 15 percent will have a high level of exposure over a 100-year period. Analysis of flood risk was limited due to a lack of extensive flood modelling. However, the report concluded that within the areas where flood modelling has taken place 19 percent of the buildings and population face a moderate to very high potential risk of flooding within a 100-year timespan. The second 'red' benchmark relates to open areas and street layout (1.1.2), suggesting a lack of adequate open areas, including streets and accessible public or private spaces that play a key role in urban resilience and sustainability. This 'red' benchmark indicates that the quality of the urban fabric is relatively low due to a lack of connectivity between streets, blocks and plots, which decreases the ability to support denser urban fabric and improve the city's ability to cope with shocks and stresses. A relatively low level of open space also decreases the options for evacuation points and the ability of public areas of a city to cope with shocks.

The third 'red' benchmark arises from the data analysis suggests that only five percent of open areas are within the urban footprint (1.1.2.1), a figure estimated by the PVMC Town Planning staff. Geospatial data was not available as a means for triangulation.

Land Tenure

The table below highlights the capacities identified in regard to *Land Tenure*, indicated by 'green' and 'yellow' benchmarks. The table also identifies vulnerabilities related to land tenure, indicated by 'red' and 'orange' benchmarks.

Land Tenure Capacities and vulnerabilities		Land Tenure				
		(CA)	(GE)	(I)	(PI)	
Questions that received a green benchmark						
1.2.1.1	Percentage of city area held under recognised land tenure					
1.2.2.1	Percentage of adult population with statutory land rights (Please disaggregate by sex and groups in vulnerable situation, if possible).				SD Direct	
1.2.2.2	Percentage of population considered landless and/or displaced (Please disaggregate by sex, age and groups in vulnerable situation, if possible)				SD Indirect	
1.2.3.2	Does the city authority in charge of land recognise and practice continuum of land rights?				Direct	
Questions that received a yellow benchmark						
1.2.1.3.1	If percentage is less than 10%, please identify reasons					Direct Soft
Questions that received a orange benchmark						
1.2.1.2	Percentage of city area considered informal					CA-3 Direct Hard
1.2.3.4	Is the city conducting awareness-raising campaigns and projects regarding the use and ownership of land?				GS	

Land Tenure		Cross-cutting issue(s)			
Land Tenure Capacities and vulnerabilities		(CA)	(GE)	(I)	(PI)
		Questions that received a red benchmark			
1.2.1.3	Percentage of informal land under tenure formalisation	 CA-3	 Direct	 Soft	
1.2.3.1	Percentage of city area with complete land administration data		 Indirect	 Soft	
1.2.3.1.1	Is there a baseline data that proves who owns what piece of vacant land in the city?			 Soft	
1.2.3.1.2	Is the data protected, backed-up and processable in an emergency situation?			 Soft	
1.2.3.3	Is the city practicing pro-poor land administration?		 Direct		

The first 'green' benchmark relates to the finding that 100 percent of the city area is held under recognised land tenure (1.2.1.1) according to a 2015 report *Urban Growth Trends Report – Port Vila: Risk Mapping and Planning for Urban Preparedness*. The second 'green' benchmark relates to the percentage of adult population with statutory land rights (1.2.2.1), which was found to be 82 percent based on the inverse of the percentage of the city that is considered informal in the 2009 National Housing Census. To this end, the census information also conveys that 75 percent of people hold legally recognised land tenure documentation and that only eight percent are without documentation but perceived as secure. However, it is important to note that the informal settlements were not included in the 2009 census, causing the potential for a misleading picture. The fourth 'green' benchmark was allocated based on the ability to answer yes to the following question: Does the city authority in charge of land recognise and practice continuum of land rights? (1.2.3.2). The Ministry of Lands and Natural Resources delivers a project entitled Vanuatu Land Program – Mama Graon, which recognises but does not yet operationalise process related to a continuum of land rights.

The 'yellow' benchmark is related to the process of formalising informality. Data from the 2009 census found that 18 percent of Port Vila was considered informal. While that number has likely increased, it is understood that there is no tenure formalisation in place for those who informally occupy land. Thus, the 'yellow' benchmark is given based on the percentage of less than 10% of tenure formalisation taking place for informally occupied land.

The first 'orange' benchmark was awarded based on the percentage of city area considered informal (1.2.1.2). In 2009, census data concluded that 18 percent of Port Vila was informal. However, the 2015 Urban Growth Trends report notes that "It is not possible to accurately measure the number of people who live in the informal settlements of Port Vila from census data" due to a discrepancy between boundaries used by the census and current understanding of

settlement boundaries. The second 'orange' benchmark was allocated based on the following question: Is the city conducting awareness-raising campaigns and projects regarding the use and ownership of land? (1.2.3.4). While the Ministry of Lands and Natural resources is running an awareness and land ownership reform project entitled Vanuatu Land Program – Mama Graon the orange benchmark was allocated based on the program being run at a national level rather than the municipal level. However, the city of Port Vila is included in the land program that targets the general public, women and vulnerable groups.

Six 'red' benchmarks were identified indicating significant potential vulnerabilities within land tenure access and governance. The first is related to the percentage of informal land under tenure formalisation (1.2.1.3), which was found to be zero based on key informant interviews with the Town Planning Department. It is understood that once the zoning plan for Port Vila has been completed formalisation processes may begin to take place. The second 'red' benchmark identifies vulnerability in relation to land administration (1.2.3). Overall, the data identifies gaps in implementing policies for land tenure and operating available land records. The 'red' benchmark was awarded due to an overall lack of flexible frameworks for recognition of land, availability of land surveys, records and other important data that increases the capacities of relevant government bodies to reduce vulnerability within the land tenure information management and implementation systems. The third 'red' benchmark relates to the percentage of city area with complete land administration data (1.2.3.1). Based on key informant interviews with the Town Planning Department and Ministry of Lands, there is currently no administrative data covering land or property in Port Vila but a zoning plan is presently under development and may be able to partially address the gap in land administration data. The fourth 'red' benchmark assesses if there is baseline data that proves who owns what piece of vacant land in the city (1.2.3.1.1). A key informant interview with the Lands Department identified that land ownership is recorded through title number and is stored at the Lands Department. This suggests that ownership of vacant land is not recorded through baseline data. The fifth 'red' benchmark finds that data is not protected, backed-up and processible in an emergency situation (1.2.3.1.2). The sixth and final 'red' benchmark identifies that that the city is not practicing pro-poor land administration (1.2.3.3).

Housing

The data related to the *Housing Component* identified one 'yellow' and one 'red' benchmark indicate limited data and a range of capacities and vulnerabilities related to resilient and adequate housing quantity and quality within Port Vila.

Housing Capacities and vulnerabilities		Housing			
		Cross-cutting issue(s)			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
None					
Questions that received a yellow benchmark					
1.3.1.1	Percentage of homes in hazardous location	 CA-3		 Indirect	 Hard
Questions that received a orange benchmark					
None					
Questions that received a red benchmark					
1.3.1.2	Percentage of homes with inadequate structure	 CA-3		 Indirect	 Hard

No 'green' benchmarks were identified within *Housing*. One 'yellow' benchmark regarding the percentage of home in hazardous locations was allocated due to data that found 85 percent of homes in Port Vila were located in hazardous areas.

The 'red' benchmark was allocated in regard to the percentage of homes with inadequate structure (1.3.1.2), which was identified as 47 percent. The quality of housing across Greater Port Vila is variable and difficult to assess as building standards are largely self-regulated and un-enforced. It also found that the National Building Code developed in 1989 lacks implementation resulting in houses that are heavily damaged during disasters.

Built Assets

Analysing key built assets such as hospitals and police stations can provide an understanding of the ways in which city emergency services function in case of a shock. The analysis of Port Vila's built assets largely identified existing capacities for responding to shocks with two 'yellow' benchmarks.

Built Assets capacities and vulnerabilities		Built Assets			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
None					
Questions that received a yellow benchmark					
1.4.1.1	Percentage of critical facilities in hazardous locations				
		CA-3			Hard
1.4.2.1	Percentage of key buildings in hazardous location				
		CA-3			Hard
Questions that received an orange benchmark					
None					
Questions that received a red benchmark					
None					

While no 'green' benchmarks were allocated to this *component*, two 'yellow' benchmarks were identified for *Built Assets*, though categorising these a capacity may be misleading. The first 'yellow' benchmark relates to the percentage of critical facilities in hazardous locations (1.4.1.1), which was estimated to be 85 percent based on graphical information published in the 2016 Urban Risk Management Strategy - Risk Mapping and Planning for Urban Preparedness. The risk mapping assesses potential risks over a 100-year period using a simulated spread of buildings to assess risk, rather than the buildings that presently exist. The second 'yellow' benchmark is allocated based on the percentage of key buildings in hazardous locations (1.4.2.1), estimating that figure to also be 85 percent. As with the point on critical facilities described above, the risk mapping assesses potential risk over a 100-year period and uses a simulated spread of buildings to assess risk, rather than the buildings that presently exist. These two findings suggest that in Port Vila, key buildings such as police stations, fire stations, banks and community and culture centres are largely located in hazardous locations. However, it should be noted that more rigorous quantitative evidence was not available for this topic. Qualitative observations suggest that over half of the key buildings would not meet adequate levels of robustness due to a lack of enforcement of building codes mentioned in questions related to 1.3.1.2, causing reason for concern.

Key Findings

- Urban expansion, both unplanned and planned, is continuously pushing into hazardous and environmentally-sensitive areas, increasing vulnerabilities and decreasing restorative and defensive services provided by the ecosystem.
- There is a clear delineation between the developed and developing areas of the city, a differentiation characterized both spatially and by inadequate urban infrastructure provision. This has resulted in the uneven and stunted development of a large part of the city, complicated by nationalised and poor land management as well as the multiple barriers in formalising land tenure.
- Improvement of spatial data and mapping is needed for more thorough assessment of the built environment, particularly regarding the location and distribution of assets, informal areas and urban growth.
- Coupled with the lack of spatial data, population data on land tenure and housing is not sufficiently disaggregated and spatially-linked, which would limit more focused interventions on the most vulnerable groups.

Supply Chain & Logistics

The *Supply Chain & Logistics Element* is comprised of four components: *Water Resources*, *Energy Sources*, *Food Supply* and *Urban Logistics*. It assesses the access, distribution and management of non-human resources such as supply of food and water, energy and logistics, especially the reliability of access during emergency.

Key Contextual Information

The provision of drinking water to Port Vila is the responsibility of the private firm Union Electrique du Vanuatu Limited (UNELCO), which relies primarily on surface water collected from nearby catchments. Contamination by human and animal excrement remains an issue due to the lack of source protection as well as from wastewater runoff during floods or heavy rainfall.

The electricity market in Port Vila is generated by an oil-fired thermal power plant operated by UNELCO, carrying out all electricity generation, transmission, and distribution, supply, and customer services. Over 80% of all electricity generated in Port Vila is from diesel fuel, which is imported by the Pacific Petroleum Company and brought by tankers primarily from Australia or Singapore. Due to the high cost of imported fossil fuels and the monopoly (or near monopoly) supplier concessions, energy costs in Vanuatu are very high. This trade-dependent economic composition is not uncommon with island nations. Like most other Pacific Island States, Vanuatu has no fossil fuel resources in its territory, thus has to import all fuel for mobile or stationary use.

Port Vila is highly dependent on its logistics network, especially concerning food supply. Changing climatic conditions and natural hazards exacerbate existing social vulnerabilities to food insecurity in urban areas. While available research indicates that Port Vila currently has enough food to meet the populations calorie requirements, the 'hidden hunger' of malnutrition is a significant concern. Factors such as rapid urban population growth, high rates of poverty and limited access to land for gardening 'reduce the ability to access sufficient fresh, nutritious food for many in urban areas. Due to poor diets, Port Vila's population face higher rates of non-communicable diseases (NCDs) and obesity relative to rural areas. The heavy reliance on imported foods also increases the vulnerability of urban populations in the event of international price increases or a decline in key sectors such as tourism as a result of natural disasters, which may impact on the capacity to purchase imported foods.

Port Vila is the logistic centre of Vanuatu and the strategic point of connectivity to the international market. Port Vila's main wharf serves as the key logistic centre and the main goods' entry point of Vanuatu, processing the majority of the goods that enter and leave the country. After entry/before export through the Port Vila wharf, goods are transported to their final destination/from their point of origin by a combination of smaller vessels or using truck transportation. Goods transported by air freight are handled in the Port Vila International Airport.

Data Collection Assessment

Compared to other *Urban Elements*, Supply Chain and Logistics data collection is largely complete (94 percent *Complete* with 6 percent *Not Available*). However, despite this overall level of completeness, there are large differences in data sources. For instance, water resources, energy sources, and urban logistics were obtained primarily from key informant interviews, with the exception of food supply. Data collected for food supply is primarily derived from a 2018 report by World Vision⁴.

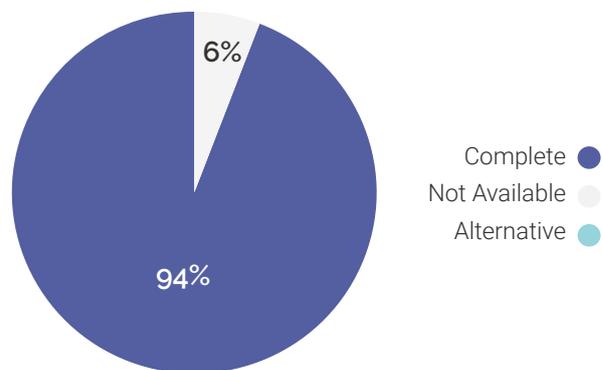


Figure 3: Data Collection Assessment (Supply Chain & Logistics). Source: CRPP (2019).

⁴ World Vision (2018). Food Security in Port Vila.

Benchmark Assessment

Regarding performance in the Supply Chain & Logistics Element, a majority of quantifiable *supporting indicators* were found to signal poor performance or vulnerabilities ("red", 44%; 'orange', 12%), with only 37 percent indicating capacities within the urban system (31% "green"; 6% yellow).

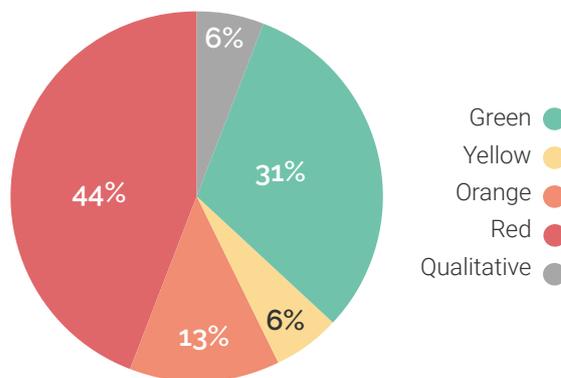


Figure 4: Benchmark Assessment (Supply Chain & Logistics). Source: CRPP (2019).

Cross-Cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed <i>supporting indicators</i> and <i>related questions</i> aligned)	CA-3 (6) CA-4 (5)		Indirect (4)	Soft (16)	Hard (9)

The *Supply Chain & Logistics Element* possesses considerable alignment with cross-cutting issues as illustrated by the table above. In particular, the *element* greatly informs the cross-cutting issue of Poor Infrastructure with 25 (including both 'hard' and 'soft' infrastructure alignment) *supporting indicators* and/or *related questions* featuring alignment. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Water Resources

The table below highlights the capacities identified in Port Vila in regard to water resources highlighted by 'green' benchmarks. No 'yellow' benchmarks were identified. The table also identifies vulnerabilities that impact water resources in Port Vila, highlighted by a single 'red' benchmark.

Water Resource Capacities and Vulnerabilities		Water Resources			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
2.1.1.1	Proportion of water supplied from each source	 CA-3		 Hard	
2.1.1.2	Does the city have an operational prioritisation of water sources based on water level data?	 CA-3		 Soft	
2.1.1.3	Does the city have strategies in place for alternative resources in times of unavailability of primary water sources?			 Indirect	 Soft
2.1.3.3	Does the city have established and operational policies and procedures for participation of local communities in water management?			 Indirect	
2.1.3.4	Is the city implementing water demand management strategies?	 CA-3			
Questions that received a yellow benchmark					
None					
Questions that received an orange benchmark					
None					
Questions that received a red benchmark					
2.1.3.1	Existence of Integrated Water Resource Management (IWRM) toolbox <i>components</i> in place	 CA-3		 Soft	

100% of Port Vila's drinking water is drawn from a single aquifer located under the Tagabe (Matnakara) River Basin. While seasonal variability and inter-annual variability of water provision were found to be low and medium, respectively, there is a sharp increase in domestic consumption, which accounts for 75% of total water consumption. Available data from UNELCO indicates that the current water source will be able to provide for the city for the next 20 years. With permission from the national government, UNELCO has begun exploring potential alternative sources (2.1.1.3), especially as urban encroachment and contamination threatens the existing water source.

The only 'red' benchmark was related to the integrated water resource management (IWRM) (2.1.3.1), a system which is not yet in place. However, an enabling environment that creates the conditions to support the implementation of an IWRM system has been identified in relation to policy, legal and strategic planning tools.

Energy Sources

With more vulnerabilities than capacities, the assessment of Port Vila's energy sector reflects its dependency on imported fossil fuels, limited availability of alternative energy at the local level, and a lack of 'redundancy within the supply chain.

Energy Resources				
Energy sources Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
2.2.1.3	Does the city have strategies in place for alternative resources and interventions during unavailability or volatility of primary energy sources?			 Soft
Questions that received a yellow benchmark				
2.2.2.2	Renewable energy share in the total final energy consumption (%)	 CA-4		
Questions that received an orange benchmark				
2.2.1.1	Proportion of energy consumed from each source, based on shares in total final consumption	 CA-4		
2.2.2.1.1	Energy price volatility			
2.2.2.1.2	Oil price volatility			
2.2.1.2.1	Spare capacity available, per source	 CA-3		 Hard

Energy Resources				
Energy sources Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received an orange benchmark				
2.2.3.1	Existence of energy efficiency regulations in place	 CA-4		 Soft
Questions that received a red benchmark				
2.2.1.2	Number of supply routes and suppliers for each energy source			 Hard
2.2.3.2	Does the local government finance clean/renewable energy transition and energy efficiency initiatives?	 CA-3		 Soft

The diversity of energy resources is analysed in order to assist the city to identify additional capacities for supplying energy in the event of unexpected demand, disruption or protracted crisis. While Strategies for alternative resources and interventions during unavailability or volatility of primary energy sources (2.2.1.3) have been identified, Port Vila's renewable energy share in the total final energy consumption (2.2.2.2) equates to only 20 percent, despite its potential for alternative generation (e.g. wind, solar). It was found that an increase in coconut oil prices on the international market has increased the cost of renewable energy at the local scale.

Much of the *Energy Supply Component* was found to be vulnerable, with five 'orange' benchmarks identified. The first relates to energy consumption by type, which revealed that total energy consumption is 20 percent renewable (of which 17 percent comes from wind and 3 percent from copra) and 80 percent from petroleum-based products.⁵ The second and third 'orange' benchmarks identify the need for further strategies to address energy (2.2.2.1.1) and oil price volatility (2.2.2.1.1) through information provided in the 2014 NAMA study on rural electrification in Vanuatu. Energy price volatility has been identified as high because energy markets mirror the highly volatile diesel market and diesel remains the primary energy generation source for Port Vila. Price fluctuation is somewhat limited at a household level through government subsidies to small-scale users, offset by higher charges for large-scale users. The NAMA recognises that consumers in Vanuatu pay among the highest retail prices in the world. This is potentially due to a combination of import-dependency, inefficient production and delivery, and a monopolisation of the energy market by UNELCO. Oil prices have also been identified as volatile due to limited governmental regulation therefore users are directly subjected to international market volatility. The fourth and fifth 'orange' benchmarks relate to a lack of spare capacity available for each source related to diesel, wind and solar (2.2.1.2.1) and insufficient energy efficiency regulations or incentives (2.2.3.1).

The two 'red' benchmarks identified address the number of supply routes and suppliers for each energy source (2.2.1.2), for which there is only one; and a finding that the local government does not finance clean/renewable energy transition and energy efficiency initiatives (2.2.3.2).

⁵ Republic of Vanuatu (2013). Vanuatu National Energy Road Map (2013-2020)

Food Supply

The food supply chain is an essential part of ensuring food security in a city. The data in this section help to understand where food is sourced, relevant dependencies, current capacities and potential vulnerabilities in order to enable more effective planning for food related strategies and interventions. The table below shows that one 'green' and four 'red' benchmarks were identified.

Food Supply				
Food Supply Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
2.3.2.4	Does the city have policies and programmes promoting sustainable food systems?			
		CA-4		Soft
Questions that received a yellow benchmark				
	None			
Questions that received an orange benchmark				
	None			
Questions that received a red benchmark				
2.3.2.2	Farm to market price differential			
2.3.3.1	What level of disruptions does the food supply chain face? (per food supply chain stage, if possible) [+]			
				Hard
2.3.3.2	Does the city have a monitoring and early warning system for food price anomalies?			
2.3.3.3	Does the city have access to food reserves and/or other strategies for food emergencies?			
		CA-4		Soft

The first and only 'green' benchmark is awarded based on the finding that the city has policies and programmes that promote sustainable food systems (2.3.2.4) as stated in its National Sustainable Development Plan 2016-2020.

There are four 'red' benchmarks that indicate potential vulnerabilities within the food supply chain. The first is regarding farm to market price differentials (2.3.2.2). No study was available on market price differentials, however, information provided by a specialist consultant for World Vision indicated that there is little to no difference in the cost of products farmers sell close to home and those transported and sold at markets. The second 'red' benchmark is indicative of the level of disruptions the food supply chain faces (2.3.3.1), which was found to be present for three primary supply chains - coconut, fruits and vegetable and beef production - between the November-March cyclone season. Reasons for disruptions to the food supply chain includes, changes to climate, the predicted increase of naturally-triggered disasters and extreme weather events, all of which impacts local food storage abilities for fruits and vegetables, increases transportation costs link to fuel prices and cold chains within the fisheries industry. A recent example is that of Cyclone Pam in 2015, which coincided with the El Nino event in 2015/2016 and resulted in a price increase of locally produced food in urban markets.

The third 'red' benchmark was allocated due to the city's absence of monitoring and early warning system for food price anomalies (2.3.3.2). After Cyclone Pam, a monitoring board was set up to monitor market prices, however, the board no longer exists and information related to the monitoring is not publicly accessible, according to a key informant from FAO. The fourth 'red' benchmark was allocated due to the city's lack of access to food reserves and/or other strategies for food emergencies (2.3.3.3). When food emergencies occur, such as that of a naturally-triggered disaster, food distributions are primarily organised by NGOs.

Urban Logistics

Interrogating a city's logistical network in order to better understand logistical delivery and capacity, operations and management can improve day-to-day operations and the unique demands of humanitarian crises. Urban Logistics is about understanding the role of local government, roads and infrastructure departments, freight and logistics operators, infrastructure operators, statistical institutes and local surveys, for example.

The data from Port Vila's *Urban Logistics Component* identifies limited capacity and a significant number of vulnerabilities. The 'green' benchmark identified in the logistics data is that of priority of access given to certain supply chains at critical

Urban Logistics		Cross-cutting issue(s)			
Urban Logistics Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
		Questions that received a green benchmark			
2.4.4.2	Is priority of access given to certain supply chains at critical freight nodes during a disruptive event?				 Soft
Questions that received a yellow benchmark					
	None				
Questions that received an orange benchmark					
2.4.1.1	Proportion of goods (tonnes) hauled by different transport modes				 Hard
2.4.2.1.1	Trends in dependency on each mode used within the functional area in the past 10 years				 Soft
2.4.2.1.2	Trend in dependency on each mode used from or to the functional area in the past 10 years				 Soft
2.4.2.1	Entry point significance in overall movement of goods, per critical entry point				 Hard
Questions that received a red benchmark					
2.4.2.2	Logistics facility capacity and complexity, per key logistics facility				 Hard

Energy Sources		Cross-cutting issue(s)			
Energy Sources Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
		Questions that received a red benchmark			
2.4.3.1	Average supply chain cost for physical goods as a percentage of revenue				 Soft
2.4.3.2	Percentage of retailers in city considered independent		 Indirect	 Soft	
2.4.3.3	Existence of public policies at the local level aimed at encouraging more sustainable practices in urban logistics systems?				
2.4.3.3.1	Are advocacy groups representing women and groups in vulnerable situations involved in setting logistics-related public policies?				 Hard
2.4.4.1	What level of disruptions does the urban logistics network face? (per goods transport mode, if possible) [+]				 Soft
2.4.4.3	Does the local government notify private logistics operators of any changes in conditions?				 Soft
2.4.4.4	Existence of integrated coordination body/system for managing urban logistics operation?				

freight nodes during a disruptive event (2.4.4.2). Freight nodes include critical entry points to the city, such as ports as well as logistics facilities. The data collected through an interview with South Sea Shipping Ltd., a leading commercial shipping business located in Port Vila, indicates that essential goods and services are prioritised in times of crisis. In the event of a crisis, a logistics cluster (led by the National Disaster Management Office and its co-chair, Oxfam) is activated to coordinate logistics.

Four 'orange' and eight 'red' benchmarks have been identified in the data, suggesting significant vulnerabilities. The 'orange' benchmarks identify an increased dependency on ground and heavy vessel transportation (there has been a sharp increase of the use of trucks (LCV/HCV) within the city's functional area and heavy vessels carrying goods to and from Port Vila over the last ten years) as well as concern over the capacity of key entry points to manage an increase or sudden redistribution of demand due to a crisis.

The eight 'red' benchmarks closely link to the discussion above regarding vulnerability related to logistics. The first 'red' benchmark identifies a low capability to meet demands during a crisis, suggesting potential bottlenecks and/or limited flexibility and/or low baseline level of integration. The second 'red' benchmark is in relation to the average supply chain cost for physical goods as a percentage of revenue (2.4.3.1), which has been identified as relatively high compared to other markets (30 percent). The third 'red' benchmark relates to poor intercity logistics movement and induced congestion. The fourth and fifth 'red' benchmarks identify that there is no existence of public policies at the local level aimed at encouraging more sustainable practices in urban logistics systems (2.4.3.3) or advocacy groups representing women and groups in vulnerable situations involved in setting logistics-related public policies (2.4.3.3.1).

The sixth 'red' benchmark indicates there is potential for a significant level of disruption to the urban logistics (2.4.4.1). Seasonal disruptions occur between November to March when cyclones most frequently take place. However, significant disruptions stem from political factors (related to compliance and safety of vessels based on spot inspections by the Maritime Authorities), environmental factors (weather related) and operational factors (due to limited training for port operators as well as the loading and off-loading that occurs by hand, which is often slow, inefficient, disorganised and unreliable). The seventh 'red' benchmark identifies that the local government does not notify private logistics operators of changes in conditions (2.4.4.3). Aside for when formal cyclone warnings are issued by the government, no other changes in weather conditions are communicated. The eighth and final 'red' benchmark highlights that there is no existence of an integrated coordination body/ system for managing urban logistics operations (2.4.4.4) for day-to-day processes. However, as noted previously, a logistics cluster does form when an emergency occurs.

Key Findings

- Initial findings indicate that informal communities, in the urban and peri-urban areas, face the greatest water insecurity. Barriers include land tenure and the costs relating to water infrastructure. Those in more informal settlements in urban areas indicated they often cannot provide the necessary paperwork for various reasons, including disputes over landownership. As a result, these communities have to purchase water from those who do have access, often at inflated prices.
- Food security in terms of sufficient access to fresh, nutritious food is a substantive concern for Port Vila's population.
- To make local foods more competitive with imported goods, regulatory mechanisms should be reviewed, including price-related measures such as tariffs on particular imported goods.
- The high reliance of urban populations on purchased food, particularly imported foods, increases the vulnerability to food insecurity particularly in times of natural disaster and increases in international food prices.
- Initial supply chain research could provide a basis for the development of a nutrition-orientated value chain analysis. Food security in terms of sufficient access to fresh, nutritious food is a substantive concern for Port Vila's population.
- While the movement of goods between Port Vila and the international market appears to be rather developed and organised, it remains weak between Port Vila and the rest of the Vanuatu, which relies almost entirely dependent on aging (and often unsafe) light vessels for transportation.
- More data is needed to better assess topics addressed in the *Urban Logistics Component*, especially in relation to the reliability of access during emergency, as understanding the nuances of the vulnerabilities and capacities within this sector is crucial for ensuring city resilience and preparedness.

Basic Infrastructure

The *Basic Infrastructure Element* is comprised of eight *components* grouped under four thematic groups. It analyses information related to energy supply in buildings and for mobility, water from its supply to sanitation and networks of wastewater and stormwater, solid waste management, and the diversity of telecommunications networks in the city.

Key Contextual Information

Port Vila's major infrastructure, including the roads, storm water drainage, and sanitation subsectors, has received minimal capital support since the time of independence in 1980. Major surfaced roads are heavily potholed and deteriorated due to deferred maintenance and absence of a system to drain the stormwater resulting from frequent heavy downpours. The runoff from these downpours causes flooding and chaotic conditions for the vehicle and pedestrian traffic resulting in considerable economic losses. In addition, all road debris such as silt, grit, garbage, waste and oil reach the sea, affecting the quality of receiving waters and causing damage to the marine environment.

The system for removal and disposal of human waste from households and business premises is, at present, environmentally unsatisfactory, as untreated sludge is disposed of in open pits near major waterways, exposing the urban population to waterborne diseases. Communities as well as major public areas of the central business district lack safe and hygienic sanitation facilities.

Data Collection Assessment

The total completion rate of data collection is 89% with 11% of data found to be *Not Available*. There was no *Alternative* data included in this analysis.

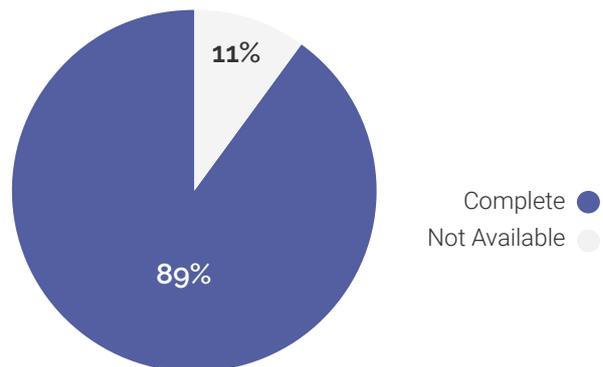


Figure 5: Data Collection Assessment (Basic Infrastructure). Source: CRPP (2019).

Benchmark Assessment

The data collected for each *component* has been allocated one of four benchmarks that indicate the degree of capacity or vulnerability. The 'green' and 'yellow' benchmarks identify key potential capacities within Port Vila while 'orange' and 'red' benchmarks identify key potential areas of vulnerability.

Port Vila's *Basic Infrastructure Element* features a mix of capacity and vulnerability, though capacities were found to be more common (53% of *supporting indicators*) than vulnerabilities (32% of *supporting indicators*). 15% of *supporting indicators* were assessed *qualitatively*. These findings should be considered fairly robust based on the 89% of data found to be available.

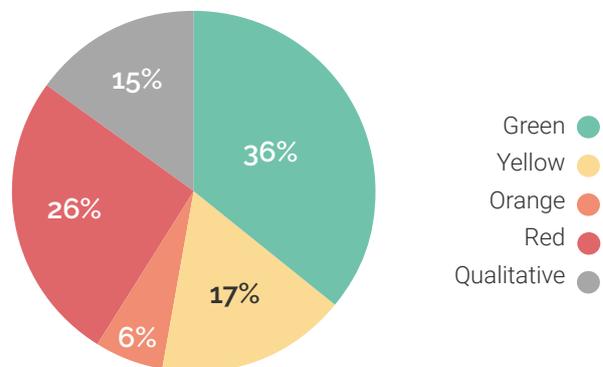


Figure 6: Benchmark Assessment (Basic Infrastructure). Source: CRPP (2019).

Cross-Cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)	CA-3 (8) CA-4 (7)	SD (7)	Direct (14) Indirect (12)	Soft (15)	Hard (33)

The *Basic Infrastructure Element* possesses considerable alignment with all four of the selected cross-cutting issues as illustrated by the table above. In particular, the *element* greatly informs the cross-cutting issues of Climate Action, Informality and, most significantly, Poor Infrastructure, which features 48 (including both 'hard' and 'soft' infrastructure alignment) *supporting indicators and/or related questions* featuring alignment. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

 www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Energy Supply Building

Electricity in Port Vila is supplied under Union Electrique du Vanuatu's (UNELCO) private concession. Electricity is generated by a bank of diesel generators and a wind farm north-west of Port Vila.

Like most other Pacific Island States, Vanuatu has no fossil fuel resources in its territory, thus has to import all fuel for mobile or stationary use. Influenced by two main parameters, the high dependency on fuel imports and the geographical setting, diesel oil accounts for the largest share of fuel imports (63.3%), with a volume of 33 million litres. 50% of the fuel demand comes from the transport sector, but diesel oil is also the main fuel for electricity generation in Vanuatu. Over 80% of all electricity generated is from diesel fuel, which is imported by the Pacific Petroleum Company and brought by tankers, mainly from Australia or Singapore. The country's renewable energy sources are substantial, although not yet utilised according to its potential

Whilst *Energy Supply Building* received more vulnerabilities than capacities, it was reported that the percentage of population with access to electricity was relatively high. For example, regarding *supporting indicator* 3.1.1.1.1 Proportion of population with access to any means of electricity, it was reported from a key informant interview with UNELCO that 80-90% of urban inhabitants have access to electricity, hence receiving a 'yellow' benchmark. However, the same cannot be said with 3.1.1.2.1 Percentage of households with an authorized connection to public network. It was reported that, while UNELCO is clear there are no illegal connections and that all current connections are authorised, there is a communal approach to sharing electricity. One house holds the primary electrical connection, and with the owner's permission, secondary connections are established. This *supporting indicator* therefore received a 'red' benchmark.

Energy Supply Building		Cross-cutting issue(s)			
Energy Supply Building Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
None					
Questions that received a yellow benchmark					
3.1.1.1.1	Proportion of population with access to any means of electricity supply (Please disaggregate by sex and groups in vulnerable situation, if possible)		 SD	 Direct	 Hard
3.1.1.3.1	Buildings Sector (Residential + Services) energy consumption per capita (ToE/cap)	 CA-4			
3.1.1.4.1	Average number of interruptions per customer per year in the public network			 Hard	
Questions that received an orange benchmark					
3.1.1.5.1	What maintenance and monitoring measures are applied in the public network, per energy supply type? [+]			 Soft	
Questions that received a red benchmark					
3.1.1.2.1	Percentage of households with an authorized connection to public network, per energy supply type [+]		 Direct	 Hard	
3.1.1.1.2	Proportion of population with primary reliance on clean fuels and technology for heating/cooling, lighting and cooking (Please disaggregate by sex and groups in vulnerable situation, if possible)	 CA-1	 Direct	 Hard	
3.1.1.3.5	Percentage of customers with Smart Electricity Meters	 CA-5		 Soft	
3.1.1.4.2	Average length of interruptions (in hours) in public network			 Hard	

Energy Supply Mobility

Vanuatu ranks among the nations with the very highest petroleum energy intensity (when comparing petroleum intensity to GDP per capita). At the same time, Vanuatu consistently has a higher petroleum price than comparable Pacific countries such as Tonga and Fiji. The cost of petroleum in Vanuatu is impacted by a lack of scale—the same supply infrastructure is required (albeit less than for higher volume countries), but market demand volumes are of a lower order of magnitude, leading to higher per litre costs. Fuel prices are determined by the international supply chain, although the price volatility and supply shocks are exacerbated by the inefficiencies in the domestic supply chain. Managing aspects of the supply chain that are within Vanuatu’s control can help to make fuel supply more reliable and efficient, and, as a result, more affordable.

Energy Supply Mobility reported a higher number of vulnerabilities than capacities. This is largely associated with the lack of monitoring measures and existence of alternative clean fuel. However, capacities were reported for level of disruptions. For example, regarding 3.1.2.3.1 What level of disruptions does the service face, no significant disruptions were reported to affect the supply of fuel in Port Vila. Despite Port Vila’s heavy dependence on importation, no major disruptions have been reported as affecting the supply flow. The first ‘orange’ benchmark was allocated due to the lack of maintenance and monitoring illustrated by Supporting indicator, 3.1.2.4.1: What maintenance and monitoring measures are applied, per network. This *supporting indicator* received an ‘orange’ benchmark based on the limited data around maintenance and monitoring. However, it is important to note that the Department of Energy recently signed a memorandum of understanding (MoU) with Pacific Petroleum specifying increased transparency and communication the two going forward.

Energy Supply Mobility		Cross-cutting issue(s)			
Energy Supply Mobility Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
3.1.2.1.1	Percentage of vehicle fuel demand covered by supply network.	 CA-3		 Indirect	 Hard
3.1.2.3.1	What level of disruptions does the service face, per source?			 Indirect	 Hard
Questions that received a yellow benchmark					
None					
Questions that received a orange benchmark					
3.1.2.4.1	What maintenance and monitoring measures are applied, per network [+]			 Indirect	 Soft
Questions that received a red benchmark					
3.1.2.1.2	Existence of alternative clean fuel vehicle network, per energy supply type [+]	 CA-3			 Hard
3.1.2.3.2	Does the city have its own network of gas station and mobile fuelling trucks to bypass the retail liquid fuels market in case of supply chain breakdown?			 Indirect	 Hard

Water Supply

UNELCO is the private utility in charge of water supply in Port Vila. The Utilities Regulatory Authority (URA) oversees UNELCO's operations. UNLECO provides treated water to 8,500 households in Port Vila. This covers most of the urban area although some informal settlements are not included in the system. In addition, urban encroachment and contamination threaten the existing water source.

Data suggests that Port Vila possesses greater capacity in regard to *Water Supply* than vulnerability. The first significant capacity is related to 3.2.1.3.4: What level of unplanned disruptions does the service face? It was reported that overall customers face a yearly disruption of only 5 minutes per customer.

Another capacity that may be interpreted as a vulnerability, and which can similarly be applied to electricity supply, is the *supporting indicator*, 3.2.1.2.1 Percentage of households covered by piped water supply network? While it is believed that 100% of households have access to a water connection, due to connection costs, which can be quite high for low income households, it is common to find one yard with the primary connection and numerous other household users that receive water through an informal contract with the primary owner of the connection. Given this dynamic and the lack of formal protections to secondary water users access, this *supporting indicator* received an 'orange' benchmark.

Water Supply				
Water Supply Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
3.2.1.2.2	Percentage of water samples in a year that complies with drinking water quality standards	 CA-4		 Hard
3.2.1.2.3	Is the capacity of the network able to cope with seasonal increases in water demand?			 Hard
3.2.1.3.1	Percentage of unaccounted for water (water loss)	 CA-4	 Indirect	 Hard
3.2.1.3.3	Are there ways to supply water to priority infrastructure?			 Hard
3.2.1.3.4	What level of unplanned disruptions does the service face?		 Indirect	 Hard

Water Supply		Cross-cutting issue(s)			
Water Supply Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a yellow benchmark					
3.2.1.4.2	What maintenance and monitoring measures are applied?			 Direct	 Soft
Questions that received an orange benchmark					
3.2.1.2.1	Percentage of households covered by piped water supply network			 Direct	 Hard
3.2.1.1.1	Percentage of population with access to water services (Please disaggregate by sex and groups in vulnerable situation, if possible)		 SD	 Direct	 Hard
Questions that received a red benchmark					
3.2.1.1.2	Are there obligations/incentives in the building codes for secondary source/reusing of water?	 CA-4			
3.2.1.3.5	If there are mechanisms in place to ensure a minimum average time for addressing unplanned disruptions?				 Soft

Wastewater and Sanitation

Port Vila's sanitation system is largely decentralised, consisting of privately managed household and commercial septic tanks. These allow the waste to decompose, but the process leaves a sludge by-product. Periodically private service providers transfer the residual sludge to a site that the Port Vila Municipality maintains adjacent to the solid waste landfill site. This site is understood to be unsatisfactory as the untreated sludge is dumped into a pond, which creates environmental and health concerns.

Port Vila reported a higher number of vulnerabilities within the *Wastewater and Sanitation Component*. The first and only capacity is related to 3.2.2.4.3 Average response time for sewerage incidents (including mains breaks and chokes. Sewage removal is conducted by private companies and response times average less than one hour.

Wastewater and Sanitation				
Wastewater and Sanitation Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
None				
Questions that received a yellow benchmark				
3.2.2.4.3	Average response time for sewerage incidents (including mains breaks and chokes)			 Soft
Questions that received an orange benchmark				
None				
Questions that received a red benchmark				
3.2.2.1.1	Percentage of population with access to sanitation facilities (Please disaggregate by sex and groups in vulnerable situation, if possible)	 SD	 Direct	
3.2.2.1.2	Percentage of population with access to handwashing facilities (Please disaggregate by sex and groups in vulnerable situation, if possible)	 SD	 Direct	 Hard
3.2.2.5.1	What monitoring and maintenance measures are applied?		 Direct	 Hard
3.2.2.5.2	Is the city conducting regular sampling of wastewater discharge for compliance with water quality standards?			 Soft

Stormwater

As noted in the introduction of this *element*, Port Vila's stormwater drainage has received minimal capital support since the time of independence in 1980. Major surfaced roads are heavily potholed and deteriorated due to deferred maintenance and absence of a system to drain the storm water resulting from frequent heavy downpours. These factors are reflected in the performance of Port Vila regarding *Stormwater*.

Port Vila reported a higher number of vulnerabilities than capacities within the *Stormwater component*. This is largely attributed to the lack of drainage systems. However, during the data collection phase, the Asian Development Bank (ADB) and Australian Department of Foreign Affairs and Trade (DFAT) implemented a large urban road upgrading project. The project identified several 'hotspots' (areas that regularly flood after heavy rains) and improved drainage catchments in these areas. Given the timing of these projects and the data collection utilised in this analysis, any impacts have not been incorporated.

The first of the vulnerability benchmarks relates to whether the city's drainage system currently able to cope with seasonal increases in rain/stormwater. The current system does not cope with seasonal increase as noted in ADB's Port Vila Urban Development report. Another key vulnerability was identified based on the unavailability of data and lack of monitoring regarding, the level of disruptions on road traffic due to water logging. Additionally, local knowledge and experience signifies that large disruptions to pedestrian and motor traffic occur due to heavy flooding.

Stormwater		Cross-cutting issue(s)			
Stormwater Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
3.2.3.2.4	Do building codes or standards that address water sensitive urban design and/or onsite stormwater solutions exist?	 CA-3			 Soft
Questions that received a yellow benchmark					
None					
Questions that received a orange benchmark					
None					
Questions that received a red benchmark					
3.2.3.1.2	Is the city's drainage system currently able to cope with seasonal increase in rain/stormwater?	 CA-3			 Hard
3.2.3.2.1	Is existing protective infrastructure well-designed and well-built based on flood risk information?	 CA-3			 Hard
3.2.3.2.2	Does the city regularly and extensively consider the use of alternative water sensitive urban design solutions?				 Hard
3.2.3.3.2	What level of disruptions on road traffic due to water logging does the service face?	 CA-3	 Indirect		 Hard
3.2.3.4.1	What monitoring and maintenance measures are applied?				 Soft

Solid Waste

Port Vila Municipal Council (PVMC) is responsible for providing a rubbish collection service for all residences, businesses, and government offices within the boundaries of the Municipality. Currently all waste collected in PVMC is deposited at the Bouffa dump site, which lies outside the Municipal boundary but is operated by PVMC. Public and private waste collection systems provide limited coverage in the central urban area of Port Vila. About 60% of household, office, and commercial wastes generated in Port Vila are collected by the municipality’s trucks.

Within the *Solid Waste Component* five ‘green’ and two ‘yellow’ benchmarks were identified, indicating a significant capacity within Port Vila for solid waste. Additionally, the analysis identified two ‘red’ benchmarks, pointing to a rather low level of vulnerability within solid waste removal.

The first of four ‘green’ benchmarks were identified based on the city’s legal obligation of pre-treatment for non-municipal solid waste generators (*supporting indicator 3.3.3.2*). According to the *2015 Vanuatu Infrastructure and Development Report 2015-2024*, the Department of Environmental Protection & Conservation (DEPC) is increasingly active in waste related matters. In April 2011 DEPC developed the *Vanuatu National Waste Management Strategy and Action Plans 2011-2016* with support from Japan International Cooperation Agency (JICA) and Secretariat of the Pacific Regional Environment Programme (SPREP). Moreover, over the last two years, stronger legislation has been drafted that better regulates the management of solid waste.

Solid Waste				
Solid Waste Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
3.3.3.2	Legal obligation of pre-treatment for non-municipal solid waste generators?	 CA-4		 Soft
3.3.5.2	Are controlled disposal sites accessible to businesses, private individuals or informal collectors for the delivery of wastes normally accepted at the site? (If yes, please select site(s) and specify who has access)		 Direct	
3.3.5.3	Characterise the trend of solid waste that has been landfilled in the last 10 years.	 CA-3		
3.3.7.2	Remaining useful life of the site where the landfill is located (in years, based on capacity and municipal solid waste generation projections). [+]			 Hard

Solid Waste		Cross-cutting issue(s)			
Solid Waste Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a yellow benchmark					
3.3.1.1	Proportion of solid waste collected out of total solid waste generated by the city, per category of waste (municipal/non-municipal; hazardous/non-hazardous; including through waste drop-off facilities for non-municipal)	 CA-3		 Direct	 Hard
3.3.4.2	Characterise the recovery trend of solid waste in the last 10 years	 CA-4			 Soft
Questions that received an orange benchmark					
3.3.6.1	What is the average number of days the solid waste systems are out of service per year?				 Hard
Questions that received a red benchmark					
3.3.1.2	Number of waste pickers per 100 000 residents			 Direct	 Hard
3.3.2.1	Percentage of population with regular municipal solid waste collection service (at least once a week) (Please disaggregate by sex and groups in vulnerable situation, if possible)	 CA-3	 SD	 Direct	 Hard

Telecommunications - Phone and Internet

The telecommunications and ICT sub-sector has changed dramatically following the opening of services to competition, and the introduction of a regulation authority, the Telecommunications and Radio-Communications Regulator (TRR). There are now seven companies providing broadband Internet, of which Digicel and TVL also provide mobile telephone services.

Telecommunications – Phone and Internet				
Telecommunications – Phone and Internet Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
3.4.1.1.1	Percentage of population with access to at least one telecommunication network (Please disaggregate by sex and groups in vulnerable situation, if possible)			
		SD	Indirect	Hard
3.4.1.1.2	Access Opportunities - Number of subscriptions per 100 inhabitants			
				Hard
3.4.1.2.1	Percentage of households covered by communication network, per network type			
			Indirect	Hard
3.4.1.3.5	Are alternative modes of information management and public communication explored for emergency situations?			
				Soft

Telecommunications – Phone and Internet					
Telecommunications – Phone and Internet Capacities and Vulnerabilities		Cross-cutting issue(s)			
		(CA)	(GE)	(I)	(PI)
Questions that received a yellow benchmark					
3.4.1.1.3	For each service offered in the city (excluding fixed telephone), please indicate affordability of the entry level plan as a percentage of per capita income) [+]				
3.4.1.4.1	What maintenance and monitoring measures are applied, per network type? [+]				
			Direct	Soft	
3.4.1.3.1	What level of disruptions does the service face?				
				Soft	
Questions that received an orange benchmark					
	None				
Questions that received a red benchmark					
	None				

This opening of competition as resulted in very strong performance as no vulnerabilities were identified. While access to mobile services is quite high, for lower income individuals, service plans/packages can indeed be financially burdensome. In general, service disruptions are fairly minimal.

Television and Radio

Capacity within the *Television and Radio* sub-component is relatively high. The analysis has identified six 'green' and one 'yellow' benchmark. No 'orange' or 'red' benchmarks were identified.

Television and Radio					
Television and Radio Capacities and Vulnerabilities		Cross-cutting issue(s)			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
3.4.2.1.1	Diversity of access mode, by mode and device options (Please disaggregate by sex and groups in vulnerable situation, if possible)				
			SD	Indirect	Hard
3.4.2.2.1	Percentage of households covered by broadcast system				
			Indirect	Hard	
3.4.2.2.1.2	Is the city covered by any local, regional or national public broadcasting?				
					Hard
3.4.2.3.3	What level of disruptions does each service face?				
					Hard
3.4.2.3.4	Is the local government able to engage with broadcast operators for Emergency Broadcasting?				
					Soft
3.4.2.4.1	What are the maintenance and monitoring measures applied, per broadcasting system: TV, Radio [+]				
			Indirect	Soft	
Questions that received a yellow benchmark					
3.4.2.3.1	Number of broadcast channels/stations operating in the city				
Questions that received an orange benchmark					
	None				
Questions that received a red benchmark					
	None				

Key Findings

- Port Vila residents pay among the highest retail prices for electricity and petroleum products in the world. While fuel prices are determined by the international supply chain, although the price volatility and supply shocks are exacerbated by the inefficiencies in the domestic supply chain. Managing aspects of the supply chain that are within Vanuatu's control can help to make fuel supply more reliable and efficient, and, as a result, more affordable.
- Public demand for improved solid waste management is high in Port Vila.
- In urban areas the proximity of unhygienic sanitation facilities to formal and informal water sources is a significant concern. There is a need for investment in sanitation and sewage treatment as reliance on current sludge disposal methods is both unsustainable and will become increasingly hazardous as population growth continues.
- The key challenges to improving solid waste and waste collection services are largely financial. There remains a disconnect between the capacity at the local government level to provide these services and the financial resources available.
- Telecommunication services (internet, mobile phone, TV and radio) were found to operate with minimal interruption and are available to the vast majority of inhabitants in Port Vila.
- In general, Port Vila's major infrastructure, including the roads, stormwater drainage, and sanitation subsectors, has received minimal capital support since the time of independence in 1980. Major surfaced roads are heavily potholed and deteriorated due to deferred maintenance and absence of a system to drain the storm water resulting from frequent heavy downpours. The runoff from these downpours causes flooding and chaotic conditions for the vehicle and pedestrian traffic resulting in considerable financial and economic losses.

Mobility

The *Mobility Element* is comprised of two *components*: *Urban Mobility* and *Inter-regional/International Mobility*. The *element* analyses information on the diversity of transport modes, coverage of infrastructure including networks and critical interchange facilities as well as potential vulnerabilities hindering the performance of the service and the consequent impacts while highlighting capacities.

Key Contextual Information

Like many other regional states, Vanuatu uses land, sea and air transport, however, sea and air transport are the main means of reaching most of its outer islands in support of inter-island and external trade and providing services to the majority of its population. Port Vila serves as one of the two entry and exit points for imported and exported goods as well as passengers visiting by ships and airplane.

All international vessels, including cargo ships and cruise liners, previously used the single facility, Port Vila International Shipping Wharf, constraining the number of ships visiting the wharf. However, during the data collection period, development on the new multipurpose shipping wharf was completed, hence, providing a separate international container port leaving the existing Port Vila International Wharf exclusively for cruise liners.

Therefore, for international transport, the Port Vila International Shipping Wharf's recent upgrading provides accommodation for container ships and passenger ships to be berthed simultaneously. For domestic shipping in Vanuatu, Port Vila serves as one of two major shipping hubs (the other being Luganville) with shipping linking the outer island nodes primarily being facilitated out of Inter-Island Shipping Wharf. The Bauerfield International Airport in Port Vila is Vanuatu's principal international gateway and handles around 250,000 international passengers per year. At present the runway is undergoing extensions and upgrading. This is to accommodate B747 and Airbus A380. Road damage from storm water is a particular problem in Port Vila due to the many hills and inadequate drainage system.

Data Collection Assessment

The total completion rate of data collection is 91%. This percentage is comprised of only quantitative data as no *alternative* data were collected. By *component*, data collection was slightly lower for *Urban Mobility* (87%) than *Inter-regional Mobility* (94%), however both *components* featured a very high completion level. However, much of the *Urban Mobility component* was also found to be *not applicable* (50%). This finding relates primarily to the lack of alternative transportation modes present in the city (e.g. train, publicly operated transportation, etc.).

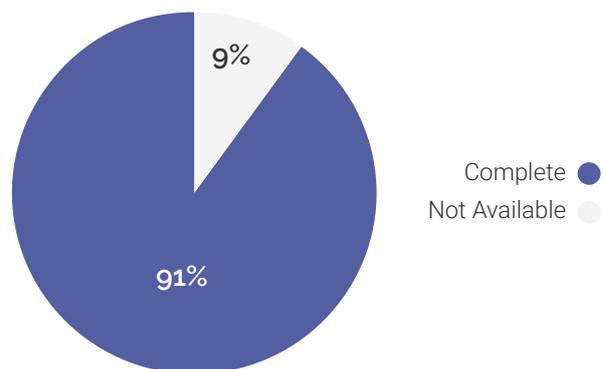


Figure 7: Data Collection Assessment (Mobility). Source: CRPP (2019).

Benchmark Assessment

As illustrated in the figure above and based on the data available, vulnerabilities (*supporting indicators* found to be 'red' or 'orange') a far larger share (49%) in comparison to capacities (data found to perform at a 'green' or 'yellow' level), which accounts for 29%. In addition, available data of qualitative information (22%) have proven useful to supplement the assessment.

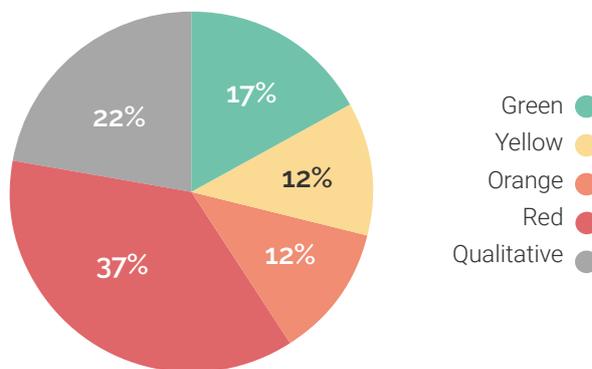


Figure 8: Benchmark Assessment (Mobility).
Source: CRPP (2019).

Cross-cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed <i>supporting indicators</i> and <i>related questions</i> aligned)	CA-3 (10)	SD (1) GS (1)		Soft (2)	Hard (15)

The *Mobility Element* possesses considerable alignment with cross-cutting issues as illustrated by the table above. In particular, the *element* greatly informs the cross-cutting issue of Poor Infrastructure with 17 (a majority of which relate to 'hard' infrastructure alignment) *supporting indicators* and/or *related questions* featuring alignment. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Urban Mobility

The *Urban Mobility Component* focuses on the movements within a city's functional boundaries by evaluating public, private and sustainable modes of transport. It assesses the role of formal and informal operators and the continuity of operations. The analysis indicates a far greater degree of vulnerability than capacity within the *Urban Mobility Component* with two 'green', four 'orange' and seven 'red' benchmarks.

Urban Mobility				
Urban Mobility Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
4.1.3.1	Percentage of city population within 500 m distance to nearest public transport stop. Please disaggregate by modes of transport listed below	 CA-3	 Indirect	 Hard
4.1.3.2	Is public transport affordable?		 Indirect	
Questions that received a yellow benchmark				
None				
Questions that received an orange benchmark				
4.1.1.3	Percentage of passengers that transfer between modes more than once per journey (Please disaggregate by sex, if possible)		 SD	
4.1.4.1	What level of disruptions does the service face?			 Hard
4.1.4.2	Does the service have adequate redundant capacity?			 Hard
4.1.4.4	What is the average travel speed on major thoroughfares during peak hours?			 Hard

Urban Mobility		Cross-cutting issue(s)			
Urban Mobility Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
		Questions that received a red benchmark			
4.1.2.5	Density of sidewalks and pedestrian paths (km / 100 000 population)	 CA-3			 Hard
4.1.3.2.2	Are these subsidies/ financial support programs accessible for female-headed households?		 GS		
4.1.3.4	Is public transport accessible to people with reduced mobility?				 Hard
4.1.3.5	Average commuting travel time using various modes of transport	 CA-3			 Hard
4.1.4.2.1	If the mode selected is public, what are the other modes of public transport that can be used, temporarily, as alternatives in case of a disruption in operations?				 Soft
4.1.4.5	Does this mode have a central control system?				 Soft
4.1.4.6	What is the average age of the transport fleet?	 CA-3			 Hard

Based on data collected, two 'green' benchmarks were allocated based on accessibility of public transport (both spatially and economically). Data indicates that 100 percent of Port Vila inhabitants live within 500 meters of a bus stop as busses regularly stop when requested rather than at pre-determined stops. For the affordability of transport, the cost of 150vt (USD 1.20) for adults and 50vt (USD 20 cents) children to travel to any destination within the municipal area is understood to be affordable for the majority of households in the city.

Four 'orange' and 11 'red' benchmarks were allocated to Urban Mobility, indicating some significant areas of vulnerability. The first 'orange' benchmark was allocated based on the percentage of passengers that transfer between modes more than once per journey, a common experience for those making the daily journey to and from work. The second and third 'orange' benchmarks were allocated based the level of disruptions for public transport service and the existence of redundant capacity built within the system. Allocated benchmarks reflect the fact that transport services within the

city are reduced on days when cruise ships dock due to the ability for private transport providers to earn more money from tourists and the lack of identifiable capacities to address these disruptions. The fourth 'orange' benchmark relates to the average speed on major roads during peak hours, which is estimated to be limited to 10-20 km per hour based on public knowledge.

In total, seven 'red' benchmarks were identified indicating specific areas of deeper vulnerability. Identified vulnerabilities include inadequate pedestrian infrastructure, the inaccessibility of public transport for people with reduced-mobility, high commute times, aging vehicles (buses), and a lack of coordination between the transport operators. This last identified vulnerability reflects the nonexistence of a central control system, the lack of which manifests in disorganized public transportation distribution and operational efficiency.

Inter-regional Mobility

This *component* analyses trips in and out of Port Vila, including international trips taken by inhabitants of the city. It focuses primarily on transportation and infrastructure such as ports and airports that link to the city's functional boundaries. Within this *component*, more vulnerabilities than capacities were identified. A total of four 'green', seven 'yellow', one 'orange' and 12 'red' benchmarks were identified.

Inter-regional Mobility					
Inter-regional Mobility Capacities and Vulnerabilities		Cross-cutting issue(s)			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
4.2.3.3	Is it accessible through at least one public urban transport mode?				
		CA-3			
4.2.3.2	Availability of adequate car parking?				
					Hard
4.2.3.4	Is it accessible for people with reduced mobility?				
					Hard
Questions that received a yellow benchmark					
4.2.2.3	Number of ports in city				
		CA-3			Hard
4.2.2.3.1	For each port, characterise capacity				
					Hard
4.2.4.1	What level of disruptions does the service face?				
					Hard
4.2.4.2	Does this service have adequate redundant capacity?				
					Hard

Inter-regional Mobility		Cross-cutting issue(s)			
Inter-regional Mobility Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a orange benchmark					
4.2.4.4	What is average age of the fleet?	 CA-3			 Hard
Questions that received a red benchmark					
4.2.2.3	Number of ports in city	 CA-3			 Hard
4.2.2.3.1	For each port, characterise capacity: [+]				 Hard
4.2.2.4	Number of airports in city	 CA-3			 Hard
4.2.2.4.1	For each airport, characterise capacity: [+]				 Hard
4.2.3.2	Availability of adequate car parking?				 Hard
4.2.3.4	Is it accessible for people with reduced mobility?				 Hard
4.2.4.3	What is the average delay?				 Hard
4.2.4.2	Does this service have adequate redundant capacity?				 Hard

Inter-regional Mobility				
Inter-regional Mobility Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a red benchmark				
4.2.4.4	What is average age of the fleet?			
		CA-3		Hard

Four 'green' benchmarks were identified indicating some level of capacity within inter-regional mobility in relation to the accessibility (for people with reduced mobility) and adequate parking for inter-regional transportation infrastructure (e.g. transportation facilities such as the wharf (port) and airport).

Within inter-regional mobility there were seven 'yellow' benchmarks allocated indicating a significant degree of capacity within the shipping wharf and the tourist boat wharf. For example, 'yellow' benchmarks were allocated based on direct observation that there is a shipping wharf port in the city (4.2.2.3) and based on direct observation that the shipping wharf has been characterised as meeting capacity (4.2.2.3.1).

'Yellow' benchmarks were also allocated for a relatively low level of disruptions for air travel and whether the air transport has adequate redundant capacity, a finding which reflects that fact that the current fleet does not meet the present passenger demand or the projects population growth pattern. The final 'yellow' benchmark relates to light vessels and the level of disruption the service faces (4.2.4.1), for which there is no data available and no monitoring. However, direct observation found that with the population spread across 64 islands there is inadequate cargo and passenger infrastructure, such as a limited presence of wharves and jetties, which prevents vessels from stopping at a number of destinations.

A number of vulnerabilities were identified within *Inter-regional Mobility*. The first and only 'orange' benchmark is allocated based on the average age of the light vessel fleet, understood to be 30 years or more based on public knowledge.

The first and second 'red' benchmarks reflect vulnerabilities within the inter-island wharf / shipping wharf (number of ports in city 4.2.2.3) based on the characterisation of the wharf's capacity (4.2.2.3.1) as below current demand, which was determined through public knowledge. The remaining 'red' benchmarks reflect vulnerabilities with the number of airports in city 4.2.2.4) and the airport's characterisation of capacity as below current demand (4.2.2.4.1) as both being low. The availability of adequate car parking and accessibility to people with reduced mobility also received a low marking. Based on public knowledge the average delay at the airport (4.2.4.3) is 120 minutes, a relatively poor performance. Both aeroplanes and vessels were reported as having a dated fleet and not meeting current demand due to an aging fleet.

Key Findings

- *Urban Mobility* behaviour and patterns in Port Vila are shaped by multiple factors, some related to the city's overall spatial organization, the low capacity of the existing transportation modes in meeting the demand, while others are related to the socio-economic capability of people to access the service.
- There is high dependency on walking as a mode of transport in Port Vila, which appears to be an outcome of the people not wanting to spend their salary on transport.
- As public transport privately owned (individual operators), there no central control system in Port Vila. As congestion worsens as the population and economic activity of Port Vila continue to increase, this lack of centralised planning for buses will likely exacerbate existing challenges such as high commute times and demand-driven disruptions (tourists) in public transport service.
- Inter-island mobility (water transportation) remains expensive, limited, and unsafe. Increased migration from rural areas of Efate as well as other islands within the Vanuatu archipelago will only exacerbate these challenges.
- While international transportation capacity is increasing, often ahead of demand (in the case of the airport and International Wharf), inter-island water transport and public transportation within Port Vila likely require investment and improved management.

Municipal Public Services

The *Municipal Public Services Element* is comprised of 12 *components* grouped under four thematic areas. It analyses information related to obligations in municipal taxes, civil registrations, and cemeteries and crematoriums; culture in cultural heritage and activities; security in public lighting and throughout the four *components* of criminal justice and law enforcement; and in relation to safety in emergency and rescue services, food inspection and monitoring institutions, and communicable diseases surveillance and response system.

Key Contextual Information

The Department of Local Authorities (DLA) within the Ministry of Internal Affairs is responsible for overseeing the local government. The Municipal Administration has revenue-raising powers, is responsible for the control, management and administration of the municipality; and has the ability to develop, control and manage land taken on lease from any statutory land authority, refuse collection and disposal, cemeteries, roads, parks and open spaces and the promotion of tourism.

The Port Vila Municipal Council (PVMC) is in responsible for some of the public services evaluated within this *element*, including *components* relating to *Cemeteries and Crematoriums*, *Civil Registration Services*, and *Municipal Taxes*, as well as in part, *Criminal Justice and Law Enforcement*, *Cultural Heritage and Cultural Activities*, *Food Inspection and Monitoring*, and *Public Lighting*. All other *components* are managed at the national level.

Data Collection Assessment

Given the high diversity of topics addressed in this *element*, there are important discrepancies between the amounts of available data per *component*. For instance, the *components* of *Criminal Justice and Law Enforcement – Justice Institutions* include little to no data available, while the other ten *components* had very high completion rates. Most of the data was gathered either by desk-based research or key informant interviews.

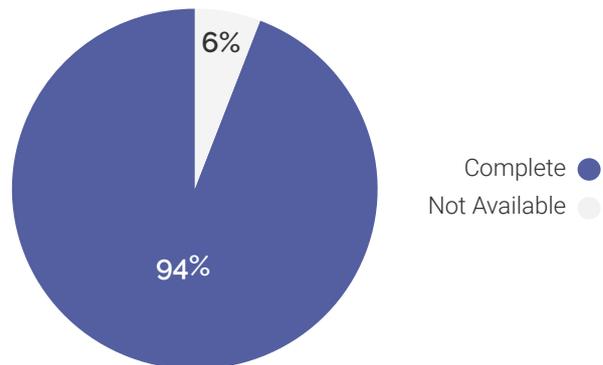


Figure 9: Data Collection Assessment (Municipal Public Services). Source: CRPP (2019).

Benchmark Assessment

Port Vila's *Municipal Public Services Element* assessment resulted in a fairly even split between capacities at 35% (*supporting indicators* achieving 'green' and 'yellow' benchmarks) vulnerabilities at 29% (those achieving 'red' and 'orange' benchmarks), and that which can be assessed *qualitatively* at 36%. These findings should be considered robust based on the 94% of data found to be available.

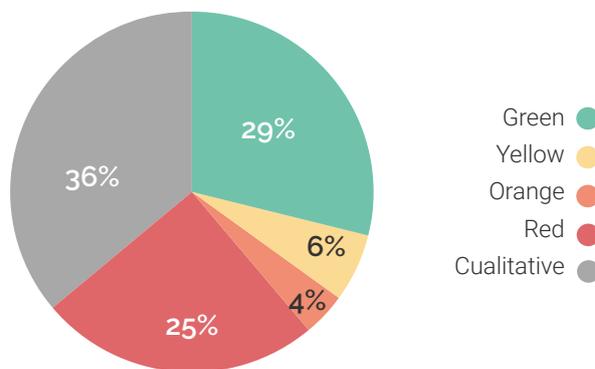


Figure 10: Benchmark Assessment (Municipal Public Services). Source: CRPP (2019).

Cross-cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)		SD (1) GS (1)		Soft (9)	Hard (16)

The *Municipal Public Services Element* possesses a relatively more limited alignment with cross-cutting issues in comparison to certain other *elements*, as illustrated by the table above. However, the *element* does possess significant alignment with the cross-cutting issue of Poor Infrastructure with 25 (including both 'hard' and 'soft' infrastructure alignment) relevant *supporting indicators* and/or *related questions*. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Cemeteries and Crematoriums

The *Cemeteries and Crematoriums Component* is designed to assess whether services are provided publicly or privately and any existing gaps in service provision by the municipal authorities. This *component* establishes an understanding of the cultural preferences and trends regarding burial and cremation in order to anticipate emerging needs towards cremation or burial infrastructure and land. Analysis of cemeteries and crematoriums indicates a high level of capacity within Port Vila with five 'green', one 'yellow', and three 'red' benchmarks as is described greater detail below.

Cemeteries and Crematoriums				
Cemeteries and Crematoriums Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.1.2.4	Does the municipality have plans for further development of the burial and crematory infrastructure?			 Soft
5.1.3.4	Are there burial and cremation services not connected to the public transportation network?			 Hard
5.1.4.1	Does the municipal government require burial site and crematorium operators to keep records on burials and cremations?			 Soft
5.1.4.2	Existence of regulations and protocols.			 Soft
5.1.4.3	Is compliance with the existing regulations or protocols monitored and enforced?			 Soft
Questions that received a yellow benchmark				
5.1.2.3.2	Do protocols exist regarding the long-term storage of non-cremated remains awaiting burial or cremation?			 Soft
Questions that received a orange benchmark				
None				

Cemeteries and Crematoriums				
Cemeteries and Crematoriums Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a red benchmark				
5.1.2.3	Do current burial and cremation infrastructures meet the needs of the population?			 Hard
5.1.3.2	Do mechanisms exist to support people who cannot afford burial or cremation services?			
5.1.3.5	Are the cultural requirements of all citizens, and particularly those of ethnic minorities, regarding the cremation, burial and exhumation of remains protected by law?			

It is evident that in Port Vila there is strong capacity within burial services. It is also important to note that Vanuatu does not practice cremation services. The first 'green' benchmark is allocated based on confirmation that the municipality has plans for further development of burial and crematory infrastructure (5.1.2.4) although immediate expansion is not required. This information was shared in a key informant interview with the PVMC. The second 'green' benchmark relates to the cemetery being accessible by bus. For the third benchmark, analysis found that the PVMC does keep comprehensive records on burials. However, according to a key informant interview with the PVMC, records are kept in hard copy on site, which is not optimal. There are plans in place to move all burial records to a digital format.

The existence of regulations and protocols (5.1.4.2) and compliance with the existing regulations or protocols being monitored and enforced (5.1.4.3) received 'green' benchmarks due to all protocols being adhered to with a requirement for signed and approved documentation before a burial can take place. However, data suggests that protocols relating to long-term storage of non-cremated remains exist but are either not enforced or sporadically enforced. Dead bodies are left at the morgue until taken to the burial site, a process that happens quickly due to refrigeration units that do not work.

Vulnerabilities relate primarily to burial capacity, funding, and legal protections for all inhabitants. Specifically, whilst *current burial and cremation infrastructure does not meet the needs of the population* (5.1.2.3), plans are in place for a new burial ground to be cleared. A 'red' benchmark was awarded based on the question, do mechanisms exist to support people who cannot afford burial or cremation services? (5.1.3.2). While support mechanisms for those who cannot afford burial services exist, informally, the Municipality will consider case-by-case situations, and culturally, Ni-Vanuatu families raise funds through community support for funeral-related procedures. As noted from discussions with the ward councillor of the Southern Ward, it was not uncommon for community members to ask for support from their ward councillor. Another vulnerability relates to whether there are cultural requirements of all citizens, and particularly those of ethnic minorities, regarding the cremation, burial and exhumation of remains protected by law? (5.1.3.5). Findings indicate that while requirements are practiced, they are not enshrined in law.

Civil Registration

Data analysed within this *component* shows a mix of capacity and vulnerability with three 'green', one 'orange' and two 'red' benchmarks. Civil registration is processed both at the local level and national level. However, all data is stored at the national level in their central system.

Civil Registration				
Civil Registration Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.2.3.3	Gender policies applied to remove barriers to birth registration			GS
5.2.4.1.1	Are the records stored in an automated process with a backup system?			Soft
5.2.4.5	What are the main uses for data related to births, marriages and deaths?			
Questions that received a yellow benchmark				
	None			
Questions that received an orange benchmark				
5.2.3.4	Is civil registration free of charge?			
Questions that received a red benchmark				
5.2.3.1	Proportion of children under 5 years of age whose births have been registered with a civil authority			SD
5.2.3.4.1	If not, is any support measure in place for poor people who do not afford paying the service?			

According to a key informant at the PVMC, since 2013, both parents can register a child, are able to transmit their nationalities to their children, their children can be registered even in the case that a parent is missing or unknown, and a marriage certificate is not required for birth registration. Data indicates that records are stored in an automated process with a backup system (5.2.4.1.1) data related to births, marriages and deaths (5.2.4.5) are primarily used for civil registration / establishing individuals' identity rather than for planning (population dynamics) at an urban level.

A low level of vulnerability was identified within *Civil Registration*. Based on key informant interviews, civil registration is free of charge when a person is between the ages 0-18. However, marriage and death registration require a fee. The proportion of children under 5 years of age whose births have been registered with a civil authority (5.2.3.1) was found to be quite low, with less than ten percent of births recorded with a civil authority since 2014 when a registry system was introduced to the PVMC. Instead, all new births are registered at the Maternity Ward of Vila Central Hospital. Lastly, the data indicates there is a lack of financial support in place for poor people who do not afford paying the service (e.g. registering the birth of a person over 18 years of age, deaths and marriages) (5.2.3.4.1).

Criminal Justice and Law Enforcement - Violence and Insecurity, Law Enforcement, Detention Facilities, and Justice Institutions

A city's level of resilience, aspects of sustainability and quality of life for residents is impacted by justice and the systems that protect people from violence and insecurity. Within the *Criminal Justice and Law Enforcement Component* four sub-components have been assessed. These are: a) *Violence and Insecurity*; b) *Law Enforcement*; c) *Detention Facilities* and d) *Justice Institutions*. Note that no benchmarks were allocated for *Detention Facilities*.

Criminal Justice and Law Enforcement				
Criminal Justice and Law Enforcement Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.3.2.3.2	Modality that law enforcement entities performing at the local level can be contacted			
5.3.1.2.2	Homicide per 100 000 inhabitants (Please disaggregate by sex, age and groups in vulnerable situation, if possible).		 SD	
5.3.1.2.3	Self-inflicted deaths (suicides) per 100 000 inhabitants.			
5.3.4.2.1	Free of charge legal aid availability in the city, including types of legal aid.			
Questions that received a yellow benchmark				
5.3.1.1.1	Crimes against property per 100 000 inhabitants.		 SD	
5.3.1.2.1	Violent crimes per 100 000 inhabitants.		 SD	
5.3.1.3.1	Percentage of inhabitants who experienced domestic violence. (Please disaggregate by sex, age and groups in vulnerable situation, if possible)		 GS	
Questions that received an orange benchmark				
None				

Criminal Justice and Law Enforcement				
Criminal Justice and Law Enforcement Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
	Questions that received a red benchmark			
5.3.2.1.1.1	If capacity is considered inadequate for any entity, please indicate the barrier(s) in reaching adequacy			
5.3.2.3.1	Operational schedule of law enforcement entities performing at the local level.			
5.3.2.3.4	Existence of a public management body that is responsible for inter-agency preparedness and response coordination			

In the *Law Enforcement sub-component*, one 'green' and three 'red' benchmarks were allocated indicating a higher degree of vulnerability than capacity within law enforcement. This is largely attributed towards insufficient financial support which in turns affects the recruitment and training of municipal wardens. The second 'red' benchmark was allocated based on the operational schedule of law enforcement entities performing at the local level (5.3.2.3.1) which is from 09:00-18:00. Within the sub-component, *Justice Institutions*, one 'green' benchmark was allocated based on the Free of charge legal aid availability in the city, including types of legal aid (5.3.4.2.1) as the functions of the Public Solicitor office is to provide legal assistance to needy persons. No formal systems for community involvement exist, however there is broad recognition by national and local government of the important role of traditional leaders in governing the community, and partnership working is encouraged in delivering services.

Cultural Heritage and Activities

By assessing *Cultural Heritage and Activities*, municipalities can gain an initial understanding of potential insufficiencies in their support for cultural policies and an understanding of regularly organised events that may require support for emergency planning purposes.

Cultural Heritage and Activities				
Cultural Heritage and Activities Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.4.2.1	Cultural facilities per capita			 Hard
5.4.3.2	Do all ethnic minorities in the city have the right to enjoy their culture, practice their religion, and use their own language in private and in public?			
5.4.3.3	Are there cultural facilities and heritage sites not connected to the public transportation network?			 Hard
Questions that received a yellow benchmark				
5.4.4.3	Have advocacy groups representing women and groups in vulnerable situations, in particular ethnic minorities, been involved in the development of cultural policies/plans?			 Soft
Questions that received a orange benchmark				
None				
Questions that received a red benchmark				
None				

A significant number of capacities have been identified within the cultural heritage and cultural activities that take place in Port Vila. Capacities include the existence of available facilities: a public library, a museum of all disciplines, an archive and documentation centre and a performing arts centre. However, there is no community and civic centre. Other capacities relate to the assessment that all ethnic minorities in the city have the right to enjoy their culture, practice their religion, and use their own language in private and in public (5.4.3.2), and cultural facilities and heritage sites are connected to the public transportation network (5.4.3.3).

While advocacy groups have not been involved in the development of cultural policies and plans, the plans themselves do take into account the interests of women and groups in vulnerable situations (5.4.4.3).

Emergency and Rescue Services

The *Emergency and Rescue Services Component* analyses fire and rescue services and the ways in which public safety, health and prevention activities are addressed. Other services, including specialised emergency services, civil emergency services and public works, are also analysed as sub-categories. Overall, more vulnerabilities were identified than capacities. In total there were three 'green', one 'orange' and five 'red' benchmarks.

Emergency and Rescue Services				
Emergency and Rescue Services Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.5.2.1	Operational schedule of emergency and response services			
5.5.2.2	Modality that emergency and rescue services can be contacted			
5.5.2.4	Existence of a public management body that is responsible for inter-agency preparedness and response coordination			
Questions that received a yellow benchmark				
None				
Questions that received an orange benchmark				
5.5.2.3	Response time of emergency and rescue services			
				Hard
Questions that received a red benchmark				
5.5.1.1	Fire emergency services operating in the city, with respective capacities.			
				Hard
5.5.1.2	Public works units available in the city, with respective capacities			
				Hard

Emergency and Rescue Services				
Emergency and Rescue Services Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a red benchmark				
5.5.1.3	Emergency services available in the city, with respective staffing and equipment capacities			 Hard
5.5.1.4	Civil emergency services available in the city, with respective staffing and equipment capacities			 Hard
5.5.1.4.2	For each entity, characterise the trends in terms of capacity in the past 10 years			 Soft

Food Inspection and Monitoring Institutions

Food Inspection and Monitoring is geared towards protecting the public right to safe and healthy food by ensuring that food safety laws and regulations are complied with in order to reduce the risk of food-borne diseases and other food-related hazards. Where food control systems are not integrated, multiple institutions with separate inspection systems for a specific food sector are used with potential for lack of coordination and gaps in inspection and monitoring processes. Mapping the institutions and authorities at a local level assists to address gaps in the system. Overall, more vulnerabilities than capacities have been identified in Port Vila with one 'green', one 'yellow', one 'orange' and five 'red' benchmarks.

Food inspection and Monitoring Institutions					
Food inspection and Monitoring Institutions Capacities and Vulnerabilities	Cross-cutting issue(s)				
	(CA)	(GE)	(I)	(PI)	
Questions that received a green benchmark					
5.6.3.2	Existence of awareness-raising activities from the food authorities regarding food safety				
Questions that received a yellow benchmark					
5.6.2.1	Are food inspections risk-based? [+]				
Questions that received a orange benchmark					
5.6.3.1	Existence of early warning and rapid alert systems in case of food safety events				
Questions that received a red benchmark					
5.6.1.3	Availability of personnel requirements for local level inspections.				
5.6.1.4	Availability and adequacy of laboratories (staff and equipment) for local scale inspections.				 Hard
5.6.2.2	Data storage availability and integration.				 Hard
5.6.2.3	Are databases maintained and up to date? [+]				
5.6.2.4	How is data analysed and reported?				

The only capacities within Food Inspection relates to the existence of awareness-raising activities from the food authorities regarding food safety (5.6.3.2). Information provided by the PVMC indicated that awareness-raising activities are taking place for the general public and to targeted groups such as food stall owners through IEC materials and community awareness materials. The second capacity was allocated based food inspections being prioritised according to risk factors (5.6.2.1).

Based on information provided by PVMC, a public notice will be issued when out-of-date/poor quality foods are reported to the authorities. However, this *supporting indicator* received an 'orange' benchmark due to this not being routinely implemented (5.6.3.1).

Extensive vulnerabilities exist in relation to a lack of personnel, institutional, and technical capacity needed for inspections. According to the PVMC, food inspections are conducted by PVMC staff (who may not have adequate training), records are saved in hardcopy (no integrated database; not up to date), and laboratory facilities for inspections are not available.

Communicable Diseases Surveillance and Response System

The *Communicable diseases surveillance and Reponse System Component* systematically collects, analyses and interprets data to inform public health policies and practices. Mapping authorities in charge of collecting data and delivering services across local, regional and national levels assists to identify gaps and overlaps in areas covered and possible vulnerabilities. This *component* identified a greater number of vulnerabilities than capacities within the system with two 'green', two 'orange' and two 'red' benchmarks. However, it is necessary to note that responsibilities of surveillance and/or response to health systems lies within the national government and or private sector.

Communicable Diseases, Surveillance and Response System Capacities and Vulnerabilities		Communicable Diseases Surveillance and Response System			
		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
5.7.1.2	Availability of adequate personnel requirements for local level surveillance.				
5.7.2.1	What type of surveillance does the authority practice? (per level, if different)				
Questions that received a yellow benchmark					
	None				
Questions that received an orange benchmark					
5.7.3.1	Existence of early warning and response systems in case of communicable disease outbreak				
5.7.3.2	Existence of awareness-raising activities as means of prevention and control of communicable diseases				
Questions that received a red benchmark					
5.7.2.2	Data storage availability and integration				
5.7.2.3	How is data analysed and reported?				
					 Hard

Municipal Taxes

The Port Vila Municipal Council's main source of revenue is from property rates – which make up roughly 40% of the annual budget. The actual rates billed are based on the level of development of each parcel.

Municipal Taxes				
Municipal Taxes Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
None				
Questions that received a yellow benchmark				
None				
Questions that received an orange benchmark				
None				
Questions that received a red benchmark				
5.8.2.1 Tax collection accessibility measures (per municipal tax authority)				
				
				Hard

The only indicator that was benchmarked received a 'red', as this was attributed to the limited access to Tax collection accessibility measures (per municipal tax authority) (5.8.2.1). In the case of Port Vila, there is no online payment or taxes, or decentralised municipal tax services at districts or neighbourhoods available. The only option is to physically go to the office in town and make payment.

Public Lighting

Public lighting is largely the responsibility of the Municipality. It is perceived to correlate with levels of safety and to reduce the incidence of crime and violence. This *component* recognises that as a public service, public lighting should be available to the population at all times to conduct their activities within a lit environment. However, in Port Vila, the private electricity company, UNELCO, provides and manages the public lighting network.

Public Lighting				
Public Lighting Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
5.9.2.1	Percentage of public space covered by public lighting, per type of space			 Hard
5.9.3.2.1	Percentage of installed public lighting infrastructure that is not functioning			 Hard
5.9.4.1	What level of disruption does the public lighting service face?			 Hard
Questions that received a yellow benchmark				
None				
Questions that received a orange benchmark				
None				
Questions that received a red benchmark				
5.9.3.1.1	Do regulations or standards exist regarding the design and performance of the lighting types used?			 Soft

Three 'green' and no 'yellow' benchmarks have been identified within public lighting, indicating Port Vila's performance in this *component* is quite strong. The first 'green' benchmark was allocated based on the percentage of public space covered by public lighting, per type of space (5.9.2.1). Based on the 2014 report entitled, Utilities Regulatory Authority, Port Vila Street Lighting U-0010-14 Commission Order, April 2014, it was concluded that 100 percent of primary roads have public lighting. The same report also noted that 100 percent of secondary roads have public lighting as well as public open spaces. The second 'green' benchmark was allocated based on the percentage of installed public lighting infrastructure that is not functioning (5.9.3.2.1). A key informant interview with UNELCO revealed that all public lighting is functioning based on the ability for UNELCO to respond within three days to a public lighting issue. The third and final 'green' benchmark was allocated based on the question, what level of disruption does the public lighting service face? (5.9.4.1). No major disruptions to public lighting occur, based on a key informant interview with UNELCO personnel and on the report entitled, Utilities Regulatory Authority, Port Vila Street Lighting U-0010-14 Commission Order, April 2014.

While the analysis found no 'orange' benchmarks it did present one 'red' benchmark related to the question, do regulations or standards exist regarding the design and performance of the lighting types used? (5.9.3.1.1). Based on the report entitled, Utilities Regulatory Authority, Port Vila Street Lighting U-0010-14 Commission Order, April 2014, it was concluded that no regulations exist.

Key Findings

- Port Vila city is faced with a high rate of population growth, variable or poor service delivery, lack of public sanitation, poor planning, a shortage of housing, high costs of living, environmental degradation and a rise in informal settlements.
- The combination of property tax information being weak or out of date, poor payment rates and non-payment of property taxes, and a property assessment system that produces limited information on value, limits the ability of the PVMC to raise needed revenues to fund priority initiatives.
- Certain services such as public lighting perform quite well in Port Vila, based on the quantitative analysis conducted. However, services overseen by international organisations and/or private utility operators (as is the case with public lighting) limit decision-making at the local level that may better align with longer-term priorities.
- The main stakeholders in Port Vila involved in the provision of municipal public services operate at the national level – such as the central government, public utilities, and governmental and non-governmental international organisations.

Social Inclusion and Protection Assessment

The *Social Inclusion and Protection Element (SIP) Element* is comprised of three macro-components, gathering data on *Social Accountability, Social Protection Floors and Basic Social Services* – such as education, health, social care and food provision. The chapter is designed to assess the availability of the aforementioned services in the city, mapping accessibility barriers that different population groups may face.

Key Contextual Information

The analysis of how SIP services are delivered in a city cannot be separated from the level of decentralisation featured in Vanuatu, hence the importance placed on mapping competencies, responsibilities and resources at different levels of governance. While aspects related to jurisdiction, decentralisation, and government capacities will be further unpacked in other *urban elements*, some key caveats are required here in order to frame both the data collection and benchmark assessments that follow. On a very general note, competencies related to social protection, education, and public health pertain to Vanuatu's central government, while local-scale food services are managed at the municipal level.

Data Collection Assessment

For the *SIP element*, 74 percent of the *supporting indicators* and *related questions* were completed, with 26 percent found to be not available. However, it is important to note that in the context of Port Vila, the services assessed under the *Social Care Component* (different from social benefits that include things like cash transfers) do not exist, therefore rendering assessment impossible. Other subsections within the *SIP Element* were also classified as *not applicable*, therefore removing them from the completion calculation presented above.

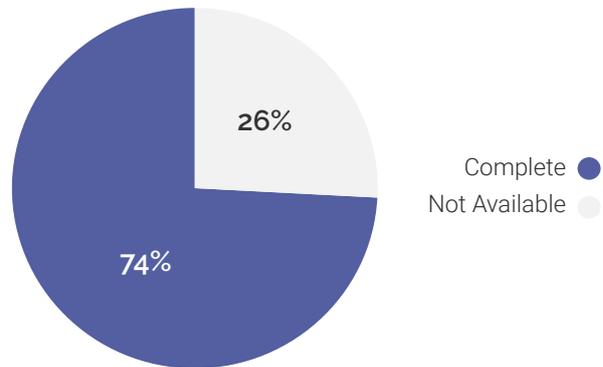


Figure 11: Data Collection Assessment (Social Inclusion and Protection Assessment). Source: CRPP (2019).

Benchmark Assessment

The data collected for each *component* has been allocated one of four benchmarks that indicate the degree of capacity or vulnerability. The green and yellow benchmarks identify key potential capacities within Port Vila while orange and red benchmarks identify key potential areas of vulnerability.

Port Vila's *SIP Element* features slightly higher levels of vulnerability (55% comprised of 22% 'orange' and 33% 'red') than capacities (45% comprised of 15% 'yellow' and 30% 'green'), as illustrated in the figure above.

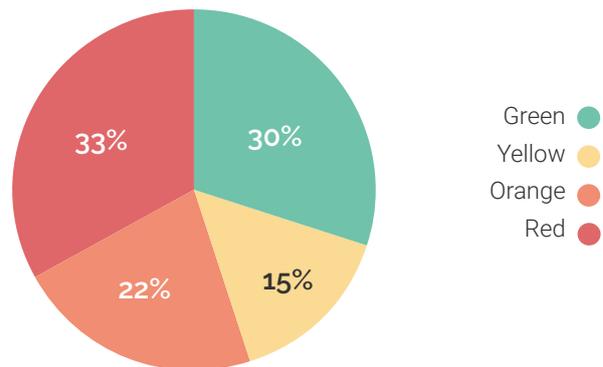


Figure 12: Benchmark Assessment (Social Inclusion and Protection Assessment). Source: CRPP (2019).

Cross-cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)	CA-3 (2)	SD (8) GS (3)	Indirect (3)	Soft (2)	Hard (7)

The *Social Inclusion and Protection Element* possesses alignment with all four of the selected cross-cutting issues as illustrated by the table above. However, in particular, the *element* greatly informs the Gender Equality cross-cutting issue, which features 11 *supporting indicators* and/or *related questions* featuring alignment. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

 www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Social Accountability

Based on the benchmarking analysis, this *component* features the highest level of vulnerabilities (80% 'red', 20% 'orange') as well as data completion rate (100% completeness). Supporting indicators and *related questions* within the *Social Accountability Component* are presented below.

Social Accountability		Cross-cutting issue(s)			
Social Accountability Capacities and Vulnerabilities	(CA)	(GE)	(I)	(PI)	
Questions that received a green benchmark					
None					
Questions that received a yellow benchmark					
None					
Questions that received an orange benchmark					
6.1.3.1	Does the local government include CSOs in decision making processes?				SD
Questions that received a red benchmark					
6.1.1.1	Does the local government consult citizens regarding its development interventions?				GS
6.1.2.1	Are there currently any citizens' initiatives under way?				
6.1.4.1	Does the local government collect citizens' feedback?				SD
6.1.5.1	Does the local government use grievance redress mechanisms (GRM) in its operations?				
6.1.5.1.1	Which of the following categories of people in vulnerable situations may access GRMs?				
6.1.5.1.2	Please select whether you employ GRM when implementing a development project that affects the following categories				

The first and only 'orange' benchmark was allocated based on the question, does the local government include CSOs in decision making processes? (6.1.3.1). While the municipality does not include CSOs in its decision-making, it does have representatives from civil society on its council. Since 2002, the Government of Vanuatu has prioritised its commitment to engage with civil society in the process of policy development. This has been articulated in the country's national development plans, stating the priority to enable greater engagement of chiefs, NGOs, and civil society in decision making by all levels of government. Despite these statements, civil society participation in government policy-making has been limited, and the opportunities that are available have been underutilized.

Six 'red' benchmarks have also been identified. The first was allocated based on the question, does the local government consult citizens regarding its development interventions? (6.1.1.1), while development projects are put forward to the municipal council board to be voted upon, implying an indirect engagement from the citizenry in decision making at the municipal level, mechanisms for citizen consultation regarding development initiatives are not currently practiced at the local government level.

Another aspect of *Social Accountability* where vulnerability was detected is regarding the lack of a mechanism for grievance feedback, under the fourth 'red' benchmark based on the question, does the local government use grievance redress mechanisms (GRM) in its operations? (6.1.5.1), to which the answer is no. However, based on a key informant interview with the PVMC, complaints can be lodged through ward councils who have offices in each of the wards. The ward councillors are able to escalate or bring the complaint to the council. Another option for grievance redress outside of the municipal council is through the Vanuatu Office of the Ombudsman. The Ombudsman is tasked with investigating complaints against public bodies such as government departments, agencies, ministries; public servants; leaders from provincial councils, municipalities and statutory bodies and their board of directors; and companies partially or wholly owned by the Vanuatu Government. Therefore, the vulnerability detected relates not to whether a grievance mechanism exists, but rather the efficacy with which the current mechanism operates was found to be inadequate.

Social Protection Floor

This *component* analyses access to social protection floor for all. Social protection is the first level of national social protection system. It ensures people's well-being through basic social security schemes, including social assistance benefits, access to essential health care and basic income security with a focus on the most vulnerable and those living in poverty. Overall, more vulnerabilities than capacities were identified within this sub-category, (2 'yellow', 5 'orange' and 21 'red').

Social Protection Floor				
Social Protection Floor Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark				
None				
Questions that received a yellow benchmark				
6.2.2.3.1	Number of adults not being able to access vaccination and immunisation programmes			
6.2.2.5	Access to outreach and awareness raising health campaigns			
Questions that received an orange benchmark				
6.2.1.3	Estimated number and proportion of youths not in education, employment or training (NEETs), sex disaggregated			
			SD	Indirect
6.2.2.2	Access to family planning and reproductive healthcare services			
			SD	Hard
6.2.2.3	Access to vaccination and immunisation programmes			
				Soft
6.2.2.4	Access to antiretroviral treatments and hepatitis C treatments			
				Hard
6.2.2.4.1	Number of infected adults not being able to access antiretroviral and hepatitis C treatments			

Social Protection Floor		Cross-cutting issue(s)				
Social Protection Floor Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)	
		Questions that received a red benchmark				
6.2.1.2	Estimated number and proportion of in work poor people, sex disaggregated.				SD	Indirect
6.2.1.6	Estimated number and proportion of poor elderly, especially those living with dependent household members or alone, sex disaggregated.				SD	Indirect
6.2.2.1	Coverage of basic universal healthcare insurance, total population, sex disaggregated.				SD	
6.2.2.1.1	Coverage of healthcare insurance for children, sex disaggregated.					
6.2.2.1.1.1	Number of children not benefiting of universal health insurance guaranteeing access to health care					
6.2.2.1.1.2	Barriers in benefitting from universal health care insurance					
6.2.2.1.2	Coverage of healthcare insurance for adults.					
6.2.2.1.2.1	Estimated number of adults not benefiting from health insurance					
6.2.2.1.2.2	If coverage is not 100% please indicate barriers in benefitting from universal health care insurance					
6.2.2.1.3	Coverage of healthcare insurance for elderly					
6.2.2.1.3.1	Estimated number of elderly not benefiting from health insurance					
6.2.2.1.3.2	Barriers in benefitting from universal health care insurance					
6.2.2.1.4	Existence of maternity leave				GS	
6.2.2.1.4.1	Is the concerned population entirely reached?					
6.2.2.1.4.2	If not, what barriers affect reaching the concerned population?					

Social Protection Floor				
Social Protection Floor Capacities and Vulnerabilities	Cross-cutting issue(s)			
	(CA)	(GE)	(I)	(PI)
Questions that received a red benchmark				
6.2.2.1.5	Existence of paternity leave.			
6.2.2.1.5.1	Is the concerned population entirely reached?			
6.2.2.1.5.2	If not, what barriers affect reaching the concerned population?			
6.2.2.1.6	Existence of outreach and awareness raising health campaigns.			
6.2.2.1.6.1	Is the concerned population entirely reached?			
6.2.2.1.6.2	Barriers affect reaching the concerned population			

In the context of Port Vila these services are managed by the national government. These vulnerabilities can be attributed towards the absence of local level policy existing and whilst national policies exist they are not being addressed at the urban level. For example, relating to question existence of maternity leave? (6.2.2.1.4) received a no as this policy exists at the national level, and while it is well known that once women falls pregnant she is dismissed from work (especially in the retail/hospitality sector). This policy can be monitored and enforced by the local government with regards to the businesses in town.

Another factor contributing towards a large number of vulnerabilities under social protection can be attributed to the coverage (or lack of coverage) of basic universal healthcare insurance. For instance, a 'red' benchmark was allocated based on the question: *coverage of basic universal healthcare insurance, total population, sex disaggregated?* (6.2.2.1). There is no basic universal healthcare coverage. According to the *2013 Vanuatu Demographic and Health Survey*, 99 percent of females and 98 percent of males aged 15-49 are not covered by any health plan or insurance scheme; thus, in Vanuatu less than 1 percent of females and only 1 percent of males are covered by health plan or insurance scheme.

Basic Social Services

Basic Social Services are services that guarantee the protection of developmental rights. Basic social services include access to education, health care, social care and other protective services for children and older people, including nutrition and food provision services.

Education

The table below summarises the benchmarking results for education for children living in Port Vila. It refers mainly to primary and secondary school levels reflecting the targets in the SDGs. Overall, greater capacity than vulnerability has been identified with two 'green', one 'yellow', and one 'red' benchmark.

Education		Cross-cutting issue(s)			
Education Capacities and Vulnerabilities	(CA)	(GE)	(I)	(PI)	
Questions that received a green benchmark					
6.3.1.2.3	Is child marriage a hindering factor in continuing the education?				
			GS		
6.3.1.2.5	Do disabled students have access to schools?				
					Hard
Questions that received a yellow benchmark					
6.3.1.2.4	Do students have access to public transportation to get to schools not within walking distance?				
					Hard
Questions that received an orange benchmark					
	None				
Questions that received a red benchmark					
6.3.1.1.1	Physical capacity of Public Education Facilities				
					Hard

The first 'green' benchmark was allocated based on the finding that child marriage was not a hindering factor with the continuum of education. The second 'green' benchmark allocated was based on the findings that disabled students have access to schools (6.3.1.2.5). Based on a 2005 World Bank report entitled, Opportunities to Improve Social Services in Vanuatu, the country is one of the first in the Pacific to attempt to address special education needs. Currently, a Special Needs Officer has been appointed and placed in charge of a nascent program. A budget has yet to be established and no staff or teachers are trained in handling special education cases, but the Ministry of Education has signalled its recognition of the need to serve disabled students.

The first and only 'yellow' benchmark was allocated based on the question, do students have access to public transportation to get to schools not within walking distance? (6.3.1.2.4). Students have partial access with the help of private transport that students themselves must pay for. In the context of Port Vila, no formal public transport exists. However, privately owned and operated transport vehicles do exist and provide transportation for school children (along with the rest of the population), thus an orange was allocated to question the question regarding do students have access to public transportation to get to schools not within walking distance.

Health

This *component* refers to access to health services for the entire population with a focus on specific demographics and reflects health targets within the SDGs. Generic issues related to regular and emergency health are assessed. Overall, more capacity than vulnerability has been identified within access to health services with four 'green' and two 'red' benchmarks.

Health		Cross-cutting issue(s)			
Health Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
6.3.2.1.3	Do local or national early warning systems for disease control exist (e.g. Ebola outbreak)?				
		CA-3			
6.3.2.1.4	Are there protocols in place for monitoring infectious diseases				
		CA-3			
6.3.2.1.5	Are there currently programmes addressing specific kinds of abuse/treatment in existence?				
6.3.2.2.2	Are hospitals accessible for persons with reduced mobility?				
				Hard	
Questions that received a yellow benchmark					
	None				
Questions that received an orange benchmark					
	None				
Questions that received a red benchmark					
6.3.2.1.2	Capacity of Emergency Response.				
				Hard	
6.3.2.1.2.1	What is the average response time for emergency responders?				
				Soft	

One of the four 'green' benchmarks relates to the existence of local or national early warning systems for disease control exist (e.g. Ebola outbreak). In 2018, the VANUATU-WHO Country Cooperation Strategy 2018-2022, was developed and released for public viewing. As recent as April 2019, the Ministry of Health through the assistance of WHO released a national warning that a current influenza outbreak was in effect. Another 'green' benchmark was allocated based on the question: are hospitals accessible for persons with reduced mobility? Ramps are allocated throughout the hospital to ensure accessibility of persons with reduced mobility.

'Red' benchmarks were allocated for *supporting indicators* related emergency response efforts. Findings, based largely on qualitative research efforts, indicate that capacities within both the national government and private sector – wherein emergency response competencies are located—are limited. Similarly, qualitative research indicates response times lacked consistency and did not meet adequate performance levels. It is worth noting that there is no emergency response unit with the PVMC.

Social Care

Social care services is comprised of two categories: 1) preventative services for physical, emotional, psychological and social situations, and 2) protective services for providing appropriate protection when a harmful situation occurs. As noted previously, topics addressed in this section were found to be '*not applicable*' to the Port Vila context where social care services do not exist.

Food

This *component* analyses access to food, particularly for the poor. The indicators refer exclusively to food provision for those in need. Overall, slightly more capacity was identified in food provision than vulnerability with two 'green', one 'yellow', one 'orange' and one 'red' benchmark.

Food		Cross-cutting issue(s)			
Food Capacities and Vulnerabilities		(CA)	(GE)	(I)	(PI)
Questions that received a green benchmark					
6.3.4.1.2	Existence of nutrition programmes to address undernourishment?				
Questions that received a yellow benchmark					
6.3.4.3.1	Describe the availability of products/regularity of shortages in accessing fresh foods.				
Questions that received an orange benchmark					
6.3.4.2.1	Access to food provision services and programmes (including those under ASPFA), sex disaggregated				
Questions that received a red benchmark					
6.3.4.1.1	Existence of malnutrition in the city?				
					 SD
6.3.4.3.4	Are there regular inspections conducted to ensure food quality?				

The 'green' benchmark was allocated based on the existence of nutrition programmes to address undernourishment (6.3.4.1.2). There are two programmes that address nutrition and undernourishment in Port Vila. These are Save the Children's My Babi project, World Vision's Helti Kakai (Healthy Food), and Wan Smol Bag's nutrition project.

The 'yellow' benchmark that was identified relates to the question, describe the availability of products/regularity of shortages in accessing fresh foods (6.3.4.3.1). According to a 2013 report by the Ministry of Finance and Economic Management, there are seasonal shortages of food. Overall, there is a high reliance of urban populations on imported foods, which increases the vulnerability to food security during naturally-triggered disasters and when international food prices increase. While the majority of key dietary staples, such as cassava, are available throughout the year, rice, a staple diet for all households, has faced market shortages.

The first of the 'red' benchmarks relates to the existence of malnutrition in the city (6.3.4.1.1). According to a 2017 World Vision report on urban food security, malnutrition is present in Port Vila. The other 'red' benchmark was allocated based on the finding that there are no regular inspections conducted to ensure food quality. Food quality inspection is the responsibility of the PVMC and limitations in inspection frequency and quality relate largely to a lack of human resources. This service is also shared with the national government.

Key Findings

- In terms of social accountability, no level of citizen consultation or citizen initiatives were identified.
- Analysis of available data suggests there is potential for the PVMC to partner with non-governmental and governmental development organisations on issues related to social protection.
- Apart from a Ministry dedicated to youth, policy makers and community leaders do not currently have established systems or structures directly related to the welfare of youth in Port Vila.
- Organisations such as Wan Smol Bag, with support from external donors, has been very successful in engaging youth in tourism and other trades and services. Such programmatic models could be supported and replicated through engagement with the PVMC.

Economy

The *Economy Element* is comprised of three *components* and analyses information related to economic composition, municipal finance and available fiscal mechanisms, and the degree to which the local economy is interconnected and connected to other markets. Analysing information related to the economic composition of a city such as its municipal finance and fiscal mechanisms, and the degree to which the local economy is connected to other markets, can provide an understanding of factors that influence economic resilience. While there are many ways to analyse urban economies, the three *components* have been selected to highlight vulnerabilities and capacities within the economic aspects of a city.

Key Contextual Information

Port Vila is the economic and administrative centre of Vanuatu. As the nation's capital, the urban area contains a large proportion of the country's governmental activities, resulting in a significant number of jobs in healthcare, education, public administration, and other related sectors. However, much of the city's rapid growth has been captured through informal activity, as the formal economy has neither the capacity nor economic infrastructure in place to absorb current demand. The results of these trends include persistent inequality, high levels of poverty, and reliance on high-value imports from international markets.

Data Collection Assessment

Data collection for the *Economy Element* for Port Vila was conducted primarily through desk-based research and supplemented through interviews with local stakeholders both inside and outside of the local government. Of particular relevance for the *Fiscal Stability and Municipal Finance Component*, official working budgets from the past three years were provided from the Finance Department within the Port Vila Municipal Council (PVMC).

These efforts resulted in an 84% level of completion, with an additional 6% characterised as *Alternative* data. Of the three *components* comprising the *Economy Element*, data collection completion is significantly higher for both the *Market Connectivity* and the *Local Economic Structure Components* than the *Fiscal Stability and Municipal Finance Component*. For Fiscal Stability and Municipal Finance, analytical efforts were therefore more limited due to the little amount of data available. However, a far more robust analysis could be conducted if more detailed current and past municipal budgets were made available.

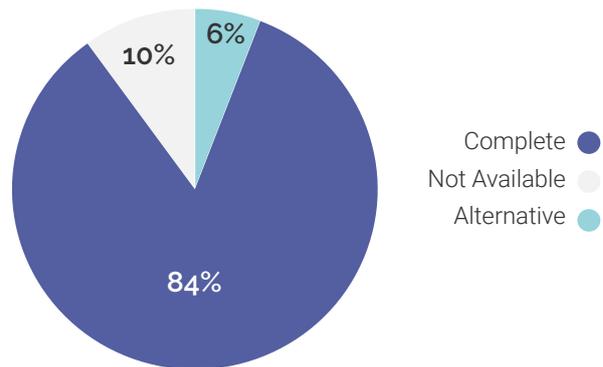


Figure 13: Data Collection Assessment (Economy).
Source: CRPP (2019).

Benchmark Assessment

From a performance perspective, the *Economy Element* was found to have a relatively positive overall assessment. Based on the data available, of the *supporting indicators* that have sufficient data, capacities (data found to perform at a 'green' or 'yellow' level) constitute a slight majority (54%) compared to vulnerabilities (*supporting indicators* found to be 'red' or 'orange'), which totals 36%. An additional 9% of available data was assessed *qualitatively*. Across components, we find that *Local Economic Structure* includes the best performing composition of *supporting indicators*, while Fiscal Stability and Municipal Finance and *Market Connectivity* both demonstrate greater vulnerability in the datasets available.

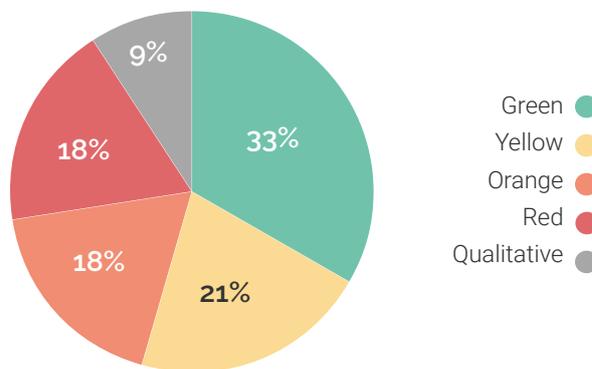


Figure 14: Benchmark Assessment (Economy).
Source: CRPP (2019).

Cross-cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)	CA-3 (4)	(11)	Direct (4) Indirect (6)		

The *Economy Element* possesses considerable alignment with cross-cutting issues as illustrated by the table above. The *element* informs all three of the selected cross-cutting issues (note that data indicating alignment for Port Infrastructure was not available at this time), with particular representation within Gender Equality and Informality. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Exemplary Indicators

Local Economic Structure

Analysing the economic structure of an urban context is intended to evaluate both the stability, and identify potential vulnerabilities, of the local economy through a holistic assessment of market reliability. Common measures include diversity⁶, gross product, and employment, as well as additional structural imbalances (inequality—both strictly based on income and that which is gender-related, the disconnect between income and real property value).

Evaluation of Port Vila's economic composition suggests key vulnerabilities may be related to median income, limited manufacturing activity, and nearly non-existent formal, circular economic activity. While the existence of poverty exacerbates Port Vila's vulnerability to a range of hazards, its industrial composition, which requires greater dependency on international imports, restricts potential local capture of economic growth.

Regarding capacities, Port Vila was found to be strong in industrial diversity, and employment diversity within the labour market. While official youth unemployment rates also rated high in relation to overall employment, however, there is reason to call into question the accuracy of these findings given the data quality and age. Overall unemployment levels (28.6%), informal employment (52%) and youth unemployment (28.6%) levels indicate a local economy unable to absorb the growing labour market into the formal economy, particularly young people. Similarly, these data suggest an enormous resource of labour, which is not being effectively leveraged. Moreover, as the data indicates the presence of worker training programs in the city, there exist pre-existing commitments at the local and national level to support better matching worker skills with market demands and thus address in part challenges related to employment.

Housing affordability can serve as either a critical capacity or vulnerability for a city when facing complex, systemic impacts from different hazards. Although far from an ideal composition, the formal Port Vila housing market is relatively affordable given income trends. Although driven by a number of factors, housing affordability in Port Vila stems in large part from the ability for supply increase based on demand, through both formal and informal means. This flexibility within housing supply has allowed pricing levels to remain relatively in line with household income trends. In other words, while Port Vila must continue to cope with the stresses associated with informal housing, the low level of publicly-subsidized housing, and persistently high levels of poverty, the relatively low density and higher availability of land, in combination with communal living patterns and relatively inexpensive construction methods, help to control the increase in housing expenses. Although formal housing market prices have largely mirrored formal income patterns, the growth in informal housing, which is particularly focused on the urban periphery, remains a growing concern. However, although this analysis is focused on urban areas located within the municipal boundaries (where a relatively small proportion of households live in informal settlements), much of the recent housing expansion in the Greater Port Vila Area has occurred in hazardous locations as well as on land with precarious tenure for many inhabitants, trends which should be closely monitored as the city continues to grow and market pressures build.

Fiscal Stability and Municipal Finance

An evaluation of the fiscal composition and financial capabilities of the local government allows for a holistic mapping of the revenue and expenditure composition of a local government, providing critical input for assessing its financial capacity and flexibility as it relates to service provision and capital investment. In particular, such an analysis is concerned with the composition of own-source revenues (i.e. generated through local taxes or fees), the distribution of expenditures to support municipal priorities, and the extent to which a local government, has access to, or is burdened from, public debt, among other relevant items.

Data collected indicates the largest concentration of capacities ('green' and 'yellow' benchmarks) are found in the *Fiscal Stability and Municipal Finance Component* and relate to diversity of revenue composition, proportion of own-source

⁶ The extent to which economic activity of a given defined geography is distributed among a number of categories such as industries, sectors, skill levels, and employment levels.

revenue, diversity within expenditure composition, and low levels of local public debt. Two capacities in particular should be noted herein: a very high proportion of the municipal budget is derived from own-source revenues (as noted above, primarily derived from land and property taxes) and a high level of expenditures are discretionary (i.e. resources are not earmarked or appropriated but may be allocated at PVMC's discretion/budgetary process) fiscal autonomy and flexibility. This combination provides the PVMC extensive flexibility and fiscal autonomy in prioritising resources.

Regarding key vulnerabilities, aside from relatively low overall municipal revenues per capita, an identified vulnerability that may hinder policy efforts includes high levels of national debt. As annual debt payments increase, national transfers to the city budget may be reduced over time. Further analysis finds that the PVMC, like many local governments in the South Pacific, remains dependent on international funding sources for most capital investments and furthermore has a limited purview over service provision and correspondingly minimal municipal budget. For instance, the PVMC has little responsibility for healthcare or education or the provision of basic utilities (water and electric), which are primarily overseen by the national government and a private utility company, respectively, resulting in a limited budgetary scope. Not only does such centralisation of service provision limit interaction between service delivery entities (duty bearers) and service recipients (rights holders), such a structure may exacerbate existing challenges related to social inclusion and protection stemming from national government and/or private enterprise provision of services. When duty-bearers (utility or other service providers in this case) are less connected to rights' holder (service recipients) and limited redress mechanisms are available, the inclusion or coverage of all groups, especially those that are the most vulnerable, is often more challenging. Furthermore, the PVMC budget remains largely incapable of supporting new initiatives or investing in medium and long-term resilience-building efforts. Exacerbating this limitation is that property/land tax revenues, the primary source of fiscal revenues, are derived from aging parcel records and relies on ineffective collection processes. The result is a gross shortfall in potential revenues. While revising collection methods would be both complex and challenging, requiring a comprehensive mapping (and ongoing tracking and subsequent revision) of all existing structures and land records, investment could potentially be recouped through increased revenues stemming from a broadened tax base.

Market Connectivity

The third *component*, *Market Connectivity*, evaluates the intensity and efficacy of the local economy's connectivity to other markets, be they regional, national or global. In this effort, connectivity (or access) is assessed at the local level (in terms of access to financial services such as banking) and at the regional and global scale through the mapping of linkages to other markets and analysis of goods movement (imports and exports).

Analysis of market connectivity suggests Port Vila is highly dependent on external markets, which, amongst other concerns, may lead to inadequate market competition and workforce capacity (i.e. local workers lack the skills required to meet market demands). Like most South Pacific cities, Port Vila's economy primarily relies on low-value services such as tourism along with public-sector employment. Limited local manufacturing and other high value-added industries correspond to the city's need to import the majority of high-value goods (e.g. cars, appliances, machine parts, agricultural equipment, pharmaceuticals, etc.) to meet demand. In relation to this import dependency, and given the relatively small market that Port Vila comprises, there is limited competition among local industries (e.g. there is a single utilities provider), resulting in minimal innovation as well as workforce development and investment. Such import dependency, along with limited competition and minimal workforce capacity, increase the local economy's vulnerability to fluctuations in both the Port Vila and global economies.

Numerous capacities fundamental to building a more resilient economy have also been identified. One such capacity relates to the degree to which Port Vila has access to, and is integrated within, the formal banking system. While other, less recognized forms of banking are also present in the local economy (informal lending, investment, collective ownership, etc.), it is nonetheless an important attribute for a local economy to provide access to financial services for both individuals and businesses. Port Vila features a relatively high level of inclusion in formal banking (e.g. number of individuals who possess and regularly access a formal bank account), access (e.g. number of ATMs present in the city), and access to mobile vending practices. These capacities both provide the potential for investment in new industries and innovation of industry practices and provide capacity for both industry and individuals to cope with the impacts of different shocks.

Key Findings

- The strengthening of local, high value-added industries (e.g. manufacturing) and support for growth of circular economic activities (e.g. recycling, improved clustering, and industrial integration) may support greater economic independence and wealth generation, and in doing so, help to build a more resilient urban economy.
- Investment in improving property tax collection methods could potentially be recouped through increased revenues stemming from a broadened tax base.
- High levels of national debt may reduce national transfers to the local government over time as annual debt payments increase.
- Port Vila's economy primarily relies on low-value services such as tourism along with public-sector employment.
- The local, provincial, and national government could prioritise investment in local economic development, and in workforce development in order to build a more flexible, integrated, complex, and therefore resilient, local economy.
- The financial infrastructure in place in Port Vila suggests that with greater market competition and a workforce possessing capacities better suited to local market demands, there exist local economic development opportunities that could be supported through focused and sustained governmental support.
- Identified vulnerabilities regarding market connectivity suggest that despite the rapid growth of Port Vila, both in terms of population and production, there is reason for investors to be cautious given the relative risks present in the economic environment.
- Capacities related to the *Market Connectivity Component* include an existing robust international trade network and a stable national currency, which should encourage longer-term investment. In addition, the availability of formal banking institutions provides a structural framework for business development at the local level.

Ecology

The *Ecology Element* adopts the ecosystem services approach to assess how the city and its surrounding region interact with and impact its ecosystems – essential in providing resources for consumption, regulating the environment, and serving cultural and recreational purposes –, and by further analysing its ecological footprint, its biodiversity and green infrastructure, and its environmental quality.

Key Contextual Information

Over half (55.8%) of the total area of Greater Port Vila catchments is still forested, with approximately equal amounts of more intact, high-density forest and modified, low-density forest. The next largest category of land cover is grassland (28.4%), of which the biggest portion is pasture or grassland, while 10.6% is actively gardened areas ('bush gardens'). Built-up areas comprise 11% of the total Port Vila urban catchments, almost all of which can be characterised as low-density urban development, with much of the more suburban areas in Greater Port Vila containing active home gardens. Mapped coastal marine areas (mangrove, seagrass and reef ecosystems) comprised 4% of the total catchments area.

Greater Port Vila is a rapidly growing metropolitan area, exposed to a wide array of climate-related and geophysical hazards under current climatic conditions. However much of the vulnerability of the city and its citizens can be attributed to poor quality, ill-maintained and under designed infrastructure assets; specifically, ineffective drainage systems, limited transport networks and the lack of enforced standards for buildings.

Data Collection Assessment

The total completion rate of data collection is 49%. A total of 49% of data was found to be *Not Available* with an additional 2% of data being classified as *Alternative*.

Most of the data for *Ecosystem Services*, *Ecological Footprint*, and *Biodiversity and Green Infrastructure* were derived from the document *Greater Port Vila Ecosystem and socio-economic resilience analysis and mapping (ESRAM)*, published in 2016, and *Ecosystem Assessment and Ecosystem-Based Adaptation (EbA) Options for Port Vila, Vanuatu*, published in 2017. Apart from these two reports, there are few sources addressing these topics for the Greater Port Vila area.

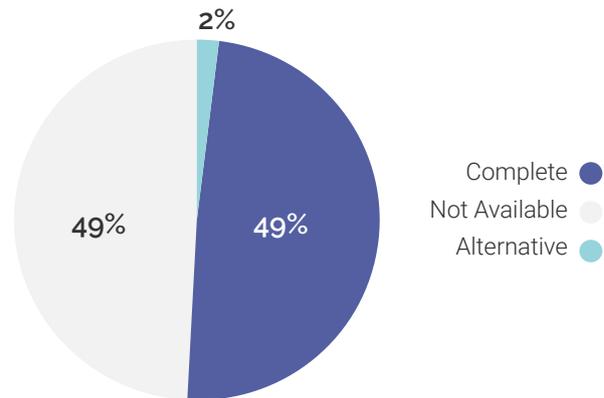


Figure 15: Data Collection Assessment (Ecology).
Source: CRPP (2019).

Benchmark Assessment

The data collected for each *component* has been allocated one of four benchmarks that indicate the degree of capacity or vulnerability. The 'green' and 'yellow' benchmarks identify key potential capacities within Port Vila while 'orange' and 'red' benchmarks identify key potential areas of vulnerability. Despite the fact that Port Vila has a defined urban boundary, urban data generally takes into consideration the peri urban population. Hence in this *element* report, Port Vila will take into consideration the greater urban area.

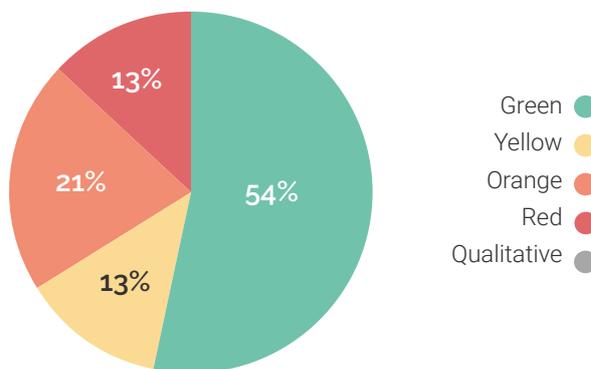


Figure 16: Benchmark Assessment (Ecology).
Source: CRPP (2019).

Port Vila's *Ecology Element* features higher levels of capacity than vulnerability, taking into consideration the 'green' benchmarking, as illustrated in the figure above. These findings should be considered only moderately robust based on the limited amount of available data (49%).

The causes of ecosystem degradation can be split into two main categories in the Port Vila context: activities of people living in Port Vila (such as overharvesting, pollution, and rapid unplanned urbanisation), and climate change (impacts include changes to rain and weather patterns). Infrastructure in Port Vila is under significant pressure, and this could lead to a decline in environmental quality and ecosystem service provision.

Cross-cutting Issues					
	Climate Action (CA)	Gender Equality (GE)	Informality (I)	Poor Infrastructure (PI)	
				Soft	Hard
Alignment with Cross-cutting Issues:					
(Completed supporting indicators and related questions aligned)	CA-2 (3) CA-3 (6)	SD (1)		Soft (1)	Hard (3)

The *Ecology Element* possesses a more limited alignment with cross-cutting issues than other *elements* as illustrated by the table above. However, perhaps not surprisingly, the *element* features considerable alignment the cross-cutting issue of Climate Action with 9 (CA-2 and CA-3) *supporting indicators* and/or *related questions* featuring alignment. For more information on cross-cutting issues, please refer to the CRPP Enhancers, which are available at the Urban Resilience Hub.

www.urbanresiliencehub.org/2019/01/10/a-modular-approach-to-capacity-building-urban-resilience-enhancers

Highlighted Indicators

In the case of Port Vila, there is clearly institutional weakness and a lack of operational capacity at the local level which affects policy-making in the city.

Given capacity limitations at the local level, and the scale and complexity of socio-ecological issues affecting Port Vila, actions to better manage ecosystems and strengthen community resilience will benefit immensely from being aligned with national and sectoral policies.

Ecology Element		Cross-cutting issue(s)			
Ecology Element		(CA)	(GE)	(I)	(PI)
Capacities and Vulnerabilities					
Questions that received a green benchmark					
8.3.1.3	Proportion of natural areas and urban green spaces in the city as a percentage of the urban area	 CA-2			 Hard
8.3.1.5	Proportion of urban green space cover (including vegetation canopy cover and blue areas), as percentage of the size of the functional area.	 CA-2	 SD		 Hard
8.4.4.1	Are there areas in the city with significant land pollution (e.g. brownfield sites, riverbeds, agricultural sites etc.)?	 CA-3			 Hard
Questions that received a yellow benchmark					
8.1.2.4	Is the local government involved in transboundary agreements or collaborations to enable policy and planning for the implementation of ecosystem services approaches?	 CA-3			
Questions that received an orange benchmark					
8.1.2.2	Please identify the policies or plans that the local government developed to preserve the selected ecosystem services			 Indirec	

Ecology Element					
Ecology Element Capacities and Vulnerabilities	Cross-cutting issue(s)				
	(CA)	(GE)	(I)	(PI)	
Questions that received a red benchmark					
8.1.2.1	Please select the services the local government obtains from the surrounding ecosystems				
		CA-3			
8.1.2.3	Does the local government take the ecosystem services approach or a different environmental approach into consideration in local policy and planning?				
		CA-3		Soft	
8.3.1.1	Specify the change in number of native species over the past ten years. If data is available, please disaggregate further, particularly into those species on the Red List of Threatened Species.				
		CA-3			
8.3.1.2	Proportion of invasive alien species as percentage of all species				
		CA-3			

Ecosystem Services

The world's natural resources not only provide us with the food, water, and raw materials to meet our basic needs but they also contribute broader societal benefits such as regulating local climates, ensuring the continued health of soils, sustaining the cultural values that are placed on natural landscapes, etc. These multitude of benefits are known collectively as 'ecosystem services' and provide the basis for community resilience and well-being through a range of provisioning, regulating, cultural and supporting services. In the case of Port Vila, findings from the research indicate that the resilience challenges for these urban and peri-urban communities are already considerable but will be further amplified by continuing urbanisation and climate change in the years and decades to come.

For example, *supporting indicator* 8.1.1.1 inquires: Indicate the level of preservation (good, bad) of the provisioning services the inhabitants are obtaining from the ecosystem, as well as the trend (enhanced, stable, degraded) over the past 10 years.? These services received a majority of bad/degraded and a 'yellow' benchmark, due predominately to the impacts of rapid urbanisation, which causes considerable degradation of the local environment and poses considerable challenges for maintaining the integrity of a number of the ecosystem services upon which the local population and economy depend. In response to these trends, the local government has initiated a 3-year ban on fishing in and around the urban coastal areas to allow for regeneration.

Ecological Footprint

Ecological Footprint provides an overview on the consumption and production patterns of people, represented by the amount of land required to answer these demands (global hectares). For example, *supporting indicator* 8.1.2.1 asks: what is the biocapacity of the region over the last 10 years? Please specify the area size (in hectares) of each land use type present in the region, in order to calculate the area's biocapacity (in global hectares) for 2008 and 2017. Research obtained from the *Ecosystem Assessment and Ecosystem-Based Adaptation* report indicates that the current trend for

biocapacity is experiencing a decrease over the past ten years, a finding which is reflected in an 'orange' benchmark. From marine and coastal areas to forests, bush and home gardens, areas are already being adversely impacted and the integrity of these ecosystems will continue to be degraded without appropriate management interventions. Critically, access to fresh water is already a pressing problem for some Port Vila communities (which became an acute concern for many during the recent El Niño period) and will continue to be a challenge going forward.

Biodiversity and Green Infrastructure

The increasing threat to Port Vila's biodiversity is the accidental or deliberate introduction of invasive or alien species. Given that Port Vila is the international entry point for the Vanuatu archipelago, most species make their arrival in the capital before spreading to outer islands.

In 2004, The World Conservation Union (IUCN) produced an updated publication of a selection of *100 of the World's Worst Invasive Species* (Lowe et al. 2004), and Vanuatu was reported as having at least 27 of the species on this list. In 2006, the IUCN reported that a total of 34 species in Vanuatu are listed in its *Red Data Book* of threatened species. While these data sources reflect national trends, given Port Vila's close proximity to forested areas, the use of this national level data is used herein to capture certain pervasive trends.

Environmental Quality

Greenhouse gas emissions are recorded at the national level. Furthermore, as no air and water quality data are available, this *component* received a low data collection rating. However, the city experiences other forms of pollution such as runoff from poor drainage system which all lead down into the harbour that surround Port Vila main town.

Key Findings

- There is clearly institutional weakness and a lack of operational capacity at the local level which affects policy-making in the city addressing ecosystem services and other ecological priorities.
- Local and international non-government organisations (NGOs) play an important role in community resilience actions in the city related to ecological vulnerabilities. For example, Wan Smol bag Theatre Company provides education on sustainable use of resources and also provides waste collection services for in informal settlements.
- The lack of access to finance and affordable plots further forces the lower middle-income class into informal settlements, which can have outsized detrimental impacts on the Port Vila environment.
- Continued lack of control leading to inappropriate development Ni-Vanuatu livelihoods and social structures are inextricably linked to the natural environment.
- The central market in Port Vila is an important centre of economic activity that interacts directly with environmental services.

Annex IV

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List of acronyms and abbreviations

- CRPT** City Resilience Profiling Tool.
- CRPP** City Resilience Profiling Programme.
- EWS** Early Warning Systems.
- UNDP** United Nations Development Programme.
- UNDRR** United Nations Office for Disaster Risk Reduction.

Annex IV

Shocks Analysis

This analytical annex brings together data and information gathered through the urban context (summary of SET1) and *Urban Performance* (summary of SET4) --both of which are presented in **Chapter 1: Port Vila in Context**, along with **Annex II City Characterisation** and **Annex III General Overview of the Urban Performance** -- with qualitative data derived from publications, and local and expert knowledge, resulting in a composite mapping of Port Vila's proneness to *shocks*, the *stresses* affecting its performance, the challenges it's facing, and their interrelations.

The annex is separated into subcomponents addressing different types of *shocks* and adopts a qualitative methodology for evaluating interrelated data, resulting in an identification of the priority *shocks* in city. These priorities are highlighted and further analysed later on in this annex. At the end of the annex, a summary of key findings of this analysis is provided.

This analysis contributes to the formulation of a comprehensive diagnosis of the urban system through capturing weaknesses, pressures and contextual changes, thereby creating a foundation for the design of implementable and adaptable actions aimed at decreasing the possible impacts of these threats at the urban scale.

4.1. Shocks

Shocks are defined as uncertain, abrupt or long-onset events that have the potential to negatively impact the purpose or objectives of an urban system.

Building off of UNISDR's 2017 terminology and taxonomy on hazards, CRPT considers six main groups of *shocks*, of which four (Natural, Biological, Environmental and Technological/Man-made) are consistent with UNISDR's taxonomy. In addition to these four groups, CRPT's list includes Complex *shocks* as well as Societal *shocks* that seek to capture a range of potential socio-economic, socio-spatial, or socio-cultural, to name a few, *shocks* to which a city may be prone (for further reading refer to **Appendix 4. List of Shocks, Stresses and Stressors**). **Figure 1** graphically represents the organisation of potential *shocks* evaluated as a part of the CRPT implementation.

Drawing on the CRPT's *shocks* taxonomy and using data collected through the urban context, documentary analysis, local knowledge, and interviews with researchers and professional experts, the following section brings together information on the different plausible *shocks* identified in Port Vila.

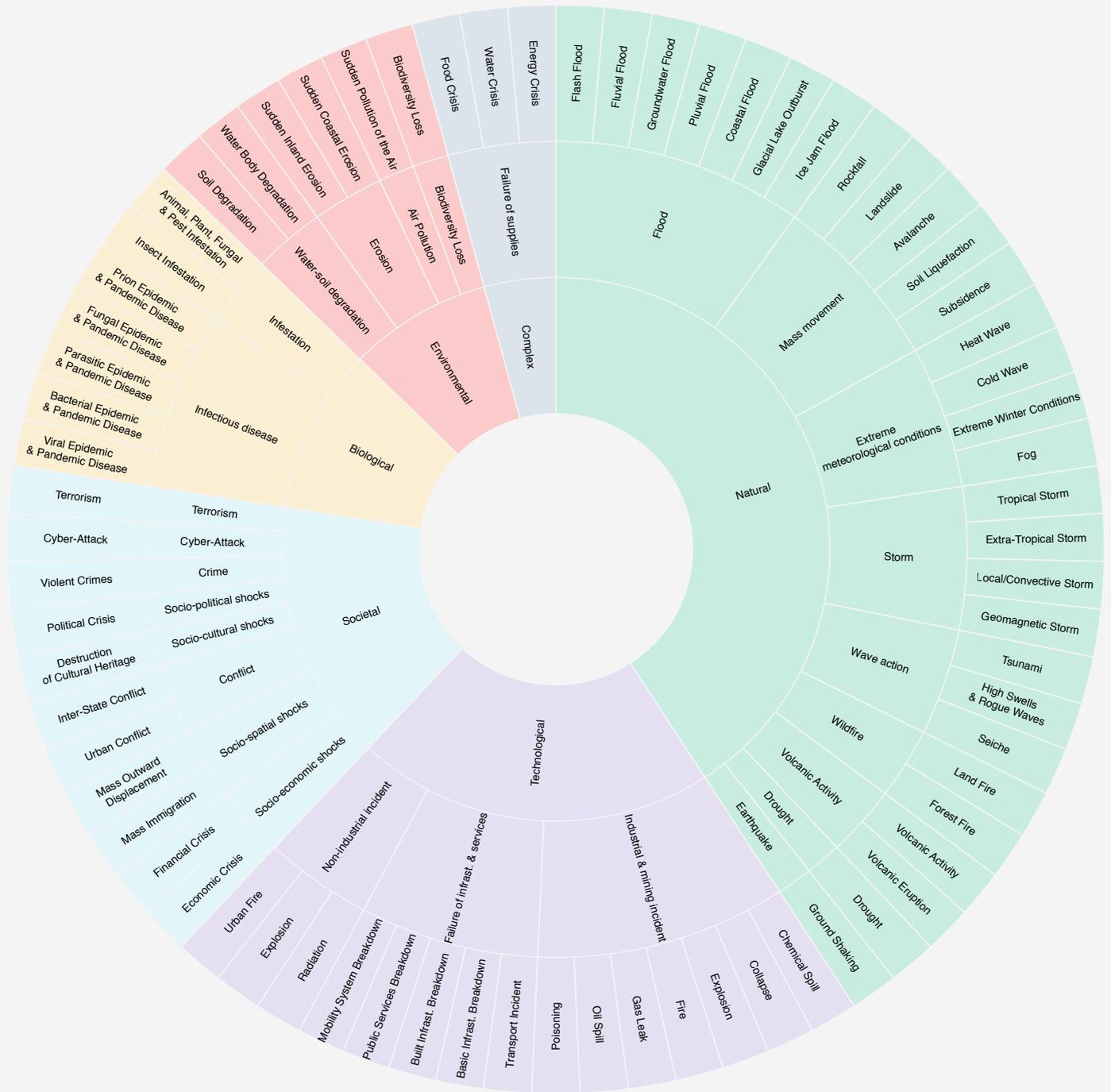


Figure 1: Wheel of Shocks. Source: CRPP (2018).

4.1.1. Identification of Shocks in Port Vila

Port Vila faces extensive environmental threats, evident in its recent ranking as the “world’s most exposed city to natural disasters”¹. Such environmental threats, many of which are linked to the impacts of climate change, are exacerbated by existence of impoverished people, limited economic opportunity, and tenuous connectivity to external markets. This exposure stems in large part from an increasing frequency of observed events such as flooding, high temperature periods, droughts, tropical cyclone, earthquakes and tsunami.

The city of Port Vila and the development of its Resilience Profile with UN-HABITAT has served as a case study for the project “Global users copernicus change service” (Glorious), a project funded by the European Commission, and developed by Lobelia to Isardsat; which has enabled us, thanks to data provided by European satellites and based on defined and calibrated models, to obtain key information on the trends of climate change in the city. This analysis indicates that climate change may induce higher average temperatures, higher sea levels, and catastrophic changes in precipitation patterns as well as affect the frequency and intensity of extreme events such as tropical cyclones, floods and droughts². For further reading, refer to **Annex V. Future climate change, expected impacts and vulnerability in Port Vila by the end of the 21st century**.

The indirect consequences of climate-related threats in Port Vila include the destruction of services and infrastructure such as roads, drainage, water and electricity systems, public spaces, and public and private buildings. Moreover, the subsistence activities of many inhabitants are sensitive to climatic risks (e.g. sea level rise, ocean acidification, erosion) due to environmental implications and reduced service delivery.

In terms of economic implications, the current losses due to risks stemming from natural disasters in Port Vila are estimated at USD 10-60 million per square kilometre³.

Table 1 below presents overview of the documented *shocks* identified in Port Vila. Each *shock* is described by its group, type and subtype according to the classification systems documented in the CRPT Table of Shocks (refer to **Appendix 4**) and partly introduced previously in the CRPT’s “Wheel of Shocks” in **Figure 1**. The table provides information on the impacts of each *shock* on people, assets and processes, while displaying their future trends based on climate change projection.

4.1.2. Prioritization of Shocks

In order to focus the analysis on the most serious *shocks* in Port Vila, defined in terms of the level of impacts on the city, a framework for prioritization has been adopted. The framework is centred around people, assets and processes affected by these adverse events. Based on data collected, this section displays impacts of each *shock* identified regarding: people (city’s inhabitants) – population injured, affected or displaced –; assets -- including physical and environmental infrastructure, among others -- and disrupted processes that have potential implications on people’s livelihoods and the city’s resilience.

In addition, the section presents how climate change trends have the potential to exacerbate the impacts of some of the *shocks* identified. In doing so, this section concludes with highlighting *shocks* found to require priority actions based on a qualitative analysis of all the aforementioned information.

¹ Verisk Maplecroft (2015). Natural Hazards Risk Atlas: Vanuatu.

² Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

³ GFDRR, 2015. Country Note: Vanuatu. Disaster Risk Financing and Insurance. Available at: www.gfdr.org/sites/default/files/publication/country-note-2015-pcrafi-vanuatu.pdf

Table 1: Listing of Shocks Identified in Port Vila and Their Characterisation.

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
Flood <ul style="list-style-type: none"> Group: Natural Type: Flood Sub-type: Pluvial Flood and Coastal Flood 	<p>Since 1970, major flood events in Port Vila occurred in: 2000, 2001, 2007, 2008, 2015 and 2017</p> <p>Floods in Port Vila are closely related to tropical cyclones and sudden sea level rise or wave actions.</p>	 <p>The current population growth and associated urban expansion is increasing flood risk as people settle in low-lying areas prone to flooding.⁴</p>	<p>Sea-level rise near Vanuatu measured by satellite altimeters since 1993 is about 6 mm per year, larger than the global average of 3.2 ± 0.4 mm per year.⁵</p> <p>Observations based on global positioning systems estimate that Port Vila is currently 'sinking' at a rate of 4.1mm per year (± 0.7mm), exacerbating climate-driven sea level rise (Kouwenhoven 2013).⁶</p>
		 <ul style="list-style-type: none"> Damage to urban infrastructure Disruption in mobility system Disruption in education Interruption of economic activities 	
Heat wave <ul style="list-style-type: none"> Group: Natural Type: Extreme Meteorological Conditions Sub-type: Heat Wave 	<p>Frequency of heatwave events are projected to increase in Port Vila due to effects of climate change.</p>	 <p>People: Projected temperature increase in Port Vila is likely to exacerbate health risks associated with heat stress.⁷</p>	<p>Port Vila is expected to experience a significant increase in the frequency of heat waves by the end of the 21st century.⁸ Projected increase in the number of heat waves per season are considerable in all seasons relative to the reference period, but particularly in February and March.</p> <p>Indication that a growing risk of heat stress in the area is likely to trigger a negative health impacts on Port Vila residents.</p>
		 <ul style="list-style-type: none"> Disruption in water supply Pressure on health services 	

⁵ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

⁶ Trundle, A. and McEvoy, D. (2015). Greater Port Vila Climate Vulnerability Assessment – Full Report (2015). Melbourne: RMIT and UN-Habitat.

⁷ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

⁸ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
Drought <ul style="list-style-type: none"> • Group: Natural • Type: Drought • Sub-type: Drought 	Dry conditions, often associated with a strong El Niño (ENSO – El Niño Southern Oscillation), as well as severe drought periods* in Vanuatu were recorded in ⁹ : <ul style="list-style-type: none"> • 1982-1983 • 1990-1995 (1993*) • 1997-1998 • 2015* ¹⁰ 	 <p>Triggered water and food shortages around the country, specifically in cyclone-affected areas.</p>	Little change is projected in the incidence of drought over the course of the 21st century. Most modelling efforts project that the frequency of mild drought will remain stable from 2030 throughout the 21st century at seven to eight times every 20 years. Under more aggressive modelling of increased global temperature, Vanuatu should expect a small decline in drought frequency from eight to nine times every 20 years in 2030 to seven to eight times by 2090 is projected.
		 <p>Significant declines in agricultural productivity and exports to Port Vila and international markets, on which a large proportion of the population rely.</p> <p>Lower production of vegetables, root crops and water shortages lead to unbalanced diet and sanitation problems, which in turn can exacerbate health problems.¹¹</p>	

⁹ Secretariat of the Pacific Community (2012). Catalogue of Rivers for Pacific Islands.

¹⁰ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

¹¹ Government of Vanuatu (2008). NATIONAL DISASTER PLAN REVIEW OF OCTOBER 2009 – OCTOBER 2010. National Disaster Management Office: Ministry of Internal Affairs

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
Cyclone <ul style="list-style-type: none"> • Group: Natural • Type: Storm • Sub-type: Tropical Storm 	<p>Through its location within the Sout Pacific Convergence Zone and within the tropical cyclone belt, the city is particularly vulnerable to intense tropical storms. The frequency and intensity of these cyclones is anticipated to increase due to the effects of climate change.¹²</p> <p>Cyclones affecting Port Vila were recorded in:</p> <ul style="list-style-type: none"> • 1972 - TC Carlotta, TC Gail, TC June • 1987 - Uma • 1992 - TC Betsy, TC Fran • 1997 - TC Susan • 2001 - TC Paula, TC Sose • 2015- TC Pam • 2017 - TC Donna 	 <p>Closely related to floods; combination of torrential rains and tropical cyclones cause floods resulting in human and economic losses.</p>	<p>On average, Port Vila experiences 23 tropical cyclones per decade, with most occurring in January and February. The high interannual variability in tropical cyclone numbers makes it difficult to identify any long-term trends in frequency.¹⁷</p> <p>Tropical cyclone numbers are projected to decline in the south-west Pacific Ocean basin (0–40°S, 130°E –170°E) (moderate confidence).¹⁸</p> <p>But there is likely to be an increase in the average maximum wind speed of cyclones by between 2% and 11% and an increase in rainfall intensity of about 20% within 100 km of the cyclone centre.¹⁹</p>
		 <p>Extremely destructive category 3-5 cyclones can cause serious damage to infrastructure and debris scattered across Port Vila limits mobility access to services.¹³</p> <p>In some instances, such as during the initial days following TC Pam, certain areas had no access to electricity and fresh water supplies. In addition, severe damage to buildings can reduce access and safety.¹⁴</p>	
		 <ul style="list-style-type: none"> • Disruption in basic services provision • Disruption in transport operations <p>Logistical challenges following tropical cyclone impacts are significant, particularly in terms of communications, transportation and needs assessments</p> <p>TC Pam: In Port Vila, it destroyed 30% of dwellings. The losses were equivalent to 64.1% of national GDP.¹⁵</p> <p>Fear of outbreaks of infectious diseases in the aftermath of cyclone Pam.¹⁶</p>	

¹² Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

¹³ OCHA (2015). Vanuatu: Severe Tropical Cyclone Pam Situation Report No. 1. Extracted here:

www.reliefweb.int/disaster/tc-2015-000020-vut.

¹⁴ Government of Australia (1992). Tropical Storm Fran: Summary. Bureau of Meteorology. Can be extracted here:

www.bom.gov.au/cyclone/history/fran.shtml

¹⁵ Government of Vanuatu (2015). Vanuatu Post-Disaster Needs Assessment: Tropical Cyclone Pam.

¹⁶ EFE (2015). "Mass vaccinations in Vanuatu to avoid epidemics cyclone aftermath". Sydney. Can be extracted here:

www.efe.com/efe/english/world/mass-vaccinations-in-vanuatu-to-avoid-epidemics-cyclone-aftermath/50000262-2565901#

¹⁷ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

¹⁸ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

¹⁹ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
Earthquake <ul style="list-style-type: none"> • Group: Environmental • Type: Water-Soil Degradation • Sub-type: Water Body Degradation 	Earthquakes affecting Port Vila were recorded in: <ul style="list-style-type: none"> • 1971 • 1990 • 2002 	 <p>The earthquake caused extensive damage in the capital and surrounding areas on the island of Efate. A small tsunami was generated.²⁰</p>	While climate change effects are not expected to impact the frequency and severity of earthquakes, they may increase Port Vila's vulnerability to cascading impacts such as the spread of disease and financial crisis or other supply chain failures.
		 <p>There have been no reports of serious casualties, but the earthquake caused damage to buildings and infrastructure.</p> <p>Three bridges linking Port Vila to North Efate (Mele, Prima and La Colle bridges), including the vulnerable low-lying communities near Mele Bay, have been seriously damaged. Landslides blocked the road to the main wharf, buried a steep road in Klems Hill area and also damaged some crops. Supplies of power, water and telecommunications have been interrupted.²¹</p>	
		 <ul style="list-style-type: none"> • Damage to agricultural productivity and related livelihoods • Decreased tourism • Port of Maputo and its rail links will need to be gradually relocated as the water rises 	

²⁰ Pararas-Carayannis, G. (2002). Disaster Pages. Can be extracted here: www.drgeorgepc.com/Tsunami2002Vanuatu.html

²¹ International Federation of Red Cross and Red Crescent Societies. (2002). Vanuatu: Earthquake - Information Bulletin n° 2. Can be extracted here: www.reliefweb.int/report/vanuatu/vanuatu-earthquake-information-bulletin-n-2

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
Tsunami <ul style="list-style-type: none"> • Group: Natural • Type: Tsunami • Sub-type: Local Tsunamis 	Port Vila is located approximately 50km east of the New Hebrides Trench, an active source of tectonic events that continue to trigger major earthquakes and tsunamis (Shorten et al. 2004). ²² Recent tsunami recorded in Port Vila occurred in: <ul style="list-style-type: none"> • 1999 • 2002²³ 	 Caused as consequences of the earthquakes. ²⁴	While climate change effects are expected to impact the frequency and severity of tsunamis to a lesser extent than cyclones, heat waves and/or floods, changes to natural protective <i>elements</i> (coral, mangroves, etc.) may increase Port Vila's vulnerability to tsunami events.
		 Maximum tsunami in 1999 run up at different parts of Port Vila, was about 3.0 meters - large enough to cause damage.	
		 Ground liquefaction was responsible for most of the damage to homes, buildings, structures and embankments. Three bridges were reported damaged or destroyed. ²⁵	

²² Trundle, A. and McEvoy, D. (2015). Greater Port Vila Climate Vulnerability Assessment – Full Report (2015). Melbourne: RMIT and UN-Habitat.

²³ NOAA (2002). Natural Hazards Data, Images and Education. NCEI Archives.

²⁴ Pararas-Carayannis, G. (2002). Disaster Pages. Can be extracted here:

www.drgeorgepc.com/Tsunami2002Vanuatu.html

²⁵ Pararas-Carayannis, G. (2002). Disaster Pages. Can be extracted here:

www.drgeorgepc.com/Tsunami2002Vanuatu.html

Identification of Shocks in Port Vila

Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<p>Parasitic epidemic</p> <ul style="list-style-type: none"> Group: Biological Type: Infectious Diseases Sub-type: Primarily Parasitic and Bacterial Epidemic and Pandemic Disease 	<p>Malaria has historically been one of the leading causes of illness in Vanuatu.</p> <p>Efforts to eliminate cases of malaria have resulted in annual parasite incidence (API) falling from 74 per 1,000 population in 2003, to 1.6 per 1,000 in 2015. This was followed by a jump to 6.8 per 1,000 in 2016 (after TC Pam), with the increase in cases coming from two provinces Malampa and Samna. The final numbers for 2017 showed that there was a slight decrease in API to 3.7.²⁶</p>	 <p>Malaria, diarrhoea, and pneumonia remain one of the main causes of death for Vanuatu.²⁷</p> <p>Evidence suggests that following major disaster events such as cyclones, malaria incidents can increase.²⁸</p>	<p>The projected intense warming over the 21st century and the associated increasing frequencies and duration of hot weather events (e.g. tropical nights) is expected also to exacerbate the exposure to health-related hazards, particularly related to nutritional deficiencies, diarrheal and vector borne diseases, already prevalent in the target area under present-day climate conditions.²⁹</p>

²⁶ UNDP (2018). Vanuatu Malaria Programme Review. Suva.

²⁷ Carter, K. et al. (2016). Causes of death in Vanuatu. *Population Health Metrics*. 2016; 14:7. Published online 2016 Mar 15. doi: 10.1186/s12963-016-0074-4

²⁸ Chan, CW. Et al (2015). Surveillance for malaria outbreak on malaria-eliminating islands in Tafea Province, Vanuatu after Tropical Cyclone Pam in 2015. *Epidemiol Infect*. 2017 Jan;145(1):41-45. Epub 2016 Sep 9.

²⁹ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

Identification of Shocks in Port Vila			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<p>Food and fuel supply crises</p> <ul style="list-style-type: none"> • Group: Societal • Type: Socio-Economic Shocks • Sub-type: Food Crisis; Fuel Crisis 	<ul style="list-style-type: none"> • 2007 - Fuel Crisis • 2007 - Global food crisis • 2008 - Global financial crisis³⁰ 	 <p>Growth of Vanuatu's traditional economy, which is the process of production and consumption outside of the monetary economy, has kept pace with the population growth. There is great flexibility and responsiveness in the traditional economy. Immediately after the food crisis, the prices of vegetables and fruit went up in the markets. But prices normalized as production went up to meet growing demand for locally produced foods.</p> <p>Some urban based families had difficulty coping with the increase in the cost of grains and the increased cost of fuel. But on the whole, there was minimal if any impact from the Food Crisis that hit the rest of the world.</p> <p>The Fuel Crisis of 2007 on the other hand is still having its impacts as transportation costs increased and have not readjusted.³¹</p>	<p>Analysis of market connectivity suggests Port Vila is highly dependent on external markets.³² Such import dependency, along with limited competition and minimal workforce capacity, increase the local economy's vulnerability to fluctuations in both the Port Vila and global economies.</p>

³⁰ UNESCAP (2010). Vanuatu National Assessment Report: 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development.

³¹ UNESCAP (2010). Vanuatu National Assessment Report: 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development.

³² MIT Atlas on economic complexity (2018). Vanuatu. www.atlas.media.mit.edu/en/profile/country/vut

As explained previously, for the purpose of prioritizing shocks in Port Vila, the following factors were considered:

- The magnitude of impacts on population, assets and processes (see **Table 1**)
- Recurrence of events and their impacts on different areas of the city and its population
- Analysis of how the shocks affect different *urban elements* and *components* of the urban system; consideration of interdependencies among constituent parts of the urban system
- Projections of climate change trends in Port Vila and how trends may worsen the impacts of identified shocks

Floods including flash, fluvial floods, pluvial floods and costal floods, as well as cyclones appear to have the most severe impacts across the three constituents of the urban system – People, Assets and Processes. These impacts are projected to increase significantly over the next few decades in Port Vila based on the climate change data.

Long-term projections of climate change trends suggest an increased frequency and severity of drought and heat waves, resulting in serious implications across various urban sectors. While health stress due to heatwave occurrence are expected to cause marked health issues and apply major pressure on health services in the city, droughts are projected to increase cases of malnutrition and lead to significant economic losses due to shrinking water tables, thus resulting in decreased agricultural production and associated food scarcity.

Spatial analysis of risks in Port Vila shows that shock events, regardless of their types and origins, are highly interrelated and their impacts are aggravated by a combination of exposure and vulnerabilities factors, mainly:

- A significant number of the city's inhabitants, of which a majority is characterised as socio-economically disadvantaged, are located in areas that are highly prone to risks of floods, sea-level rise and coastal erosion, and lack adequate delivery of basic services and risk preventive infrastructure, such as water drainage network.
- The living conditions in some of these risk-prone areas are precarious as certain settlement patterns are informal where adequate structures and basic services supply are lacking.
- The livelihood practices of residents in risk-prone areas (including agricultural practices, securing basic needs, and construction practices) will become more challenging due to the deterioration of the ecosystem and biodiversity loss along the coastal areas, such as the destruction of mangroves.

In combination with the above explanation of the qualitative analysis conducted, a cross-sectional qualitative reading by experts from the CRPP and stakeholder consultation was conducted with the purpose of validating the outcomes of this analysis. The resulting five key shocks – priority shocks – presented below, will be explained in further details through the following sections.

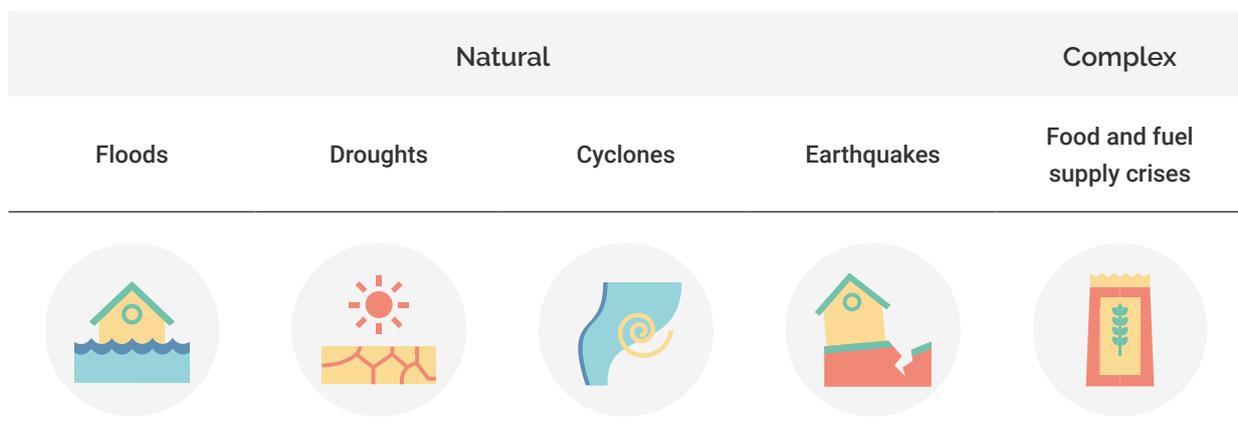


Figure 2: Prioritised Shocks in Port Vila

4.1.3. Description of Prioritized Shocks

The following paragraphs describe the key shocks that concern Port Vila. This description covers the frequency of occurrence, causes, secondary shocks that can be triggered, and affected *Urban Elements* and *components*.

4.1.3.1. Flood

Since 1970, major flood events in Port Vila occurred in: 2000, 2001, 2007, 2008, 2015 and 2017. Floods in Port Vila are closely related to tropical cyclones and sudden sea level rise or wave actions (largely earthquake-induced tsunamis).

The current population growth and associated urban expansion in Port Vila is increasing flood risk as people settle in greater numbers in low-lying areas prone to flooding. These growth and associated risk trends will be further exacerbated by climate change-related warming.

Projections indicate that under the warmer climate Port Vila will experience an increase in the frequency of heavy and very heavy precipitation days.³⁴ This intensity of precipitation will increase the risk of flash, pluvial and fluvial flood occurrences if effective prevention and mitigation strategies are not implemented.

Furthermore, Sea-level rise near Vanuatu measured by satellite altimeters since 1993 is about 6 mm per year, larger than the global average of 3.2 ± 0.4 mm per year.³⁵ Observations based on global positioning systems estimate that Port Vila is currently 'sinking' at a rate of 4.1mm per year (+/-0.7mm), exacerbating climate-driven sea level rise (Kouwenhoven 2013).³⁶ This combination increases the risk of flooding directly related to sea-level rise as well as indirectly related, such is the case with tropical cyclones and tsunamis.

Flood events lead to erosion of coastal areas and landslides. Moreover, the inadequate management of water systems and waste collection aggravates the risks of parasitic and/or vector-borne diseases such as malaria. Intense and frequent flooding also disrupts the provision of services and leads to the degradation of infrastructural and environmental assets, as presented in the **Table 2** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
Flood 	<ul style="list-style-type: none"> • Degradation of coastal environment • Vector-borne diseases • Landslide 	Built Environment	Housing, Built Assets
		Ecology	Biodiversity and green Areas
		Supply Chain and Logistics	Water Resources, Energy Resources, Food Supply, Logistics
		Basic Infrastructure	Water and Energy Supply, Solid Waste Management
		Mobility	Urban and Inter-Regional Mobility

Table 2: Secondary Shocks Triggered and Affected *Urban Elements* and Components by Floods.

³³ Government of Vanuatu (2008). Education of Natural Disaster Preparedness for Sustainable Development. National Disaster Risk Management Office.

³⁴ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

³⁵ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

³⁶ Trundle, A. and McEvoy, D. (2015). Greater Port Vila Climate Vulnerability Assessment – Full Report (2015). Melbourne: RMIT and UN-Habitat.

4.1.3.2. Drought

Vanuatu has faced serious drought periods due to intensified temperature and changing patterns in precipitation.³⁷ Dry conditions in Vanuatu are often associated with a strong El Niño (ENSO – El Niño Southern Oscillation). Severe drought periods* in Vanuatu were recorded in 1982-1983, 1990-1995 (1993), 1997-1998, and 2015.^{38 39}

Drought events can trigger water and food shortages around the country. In Port Vila, drinking water is drawn entirely from a single groundwater source, which if not recharged adequately due to dry conditions, could result in water shortages for the city.

Drought conditions can induce significant declines in agricultural productivity throughout the country, and in turn a reduction in domestic importation to Port Vila. The effect of this dynamic is an increased reliance on foreign imports and associated higher food prices for the local population. In addition, lower production of vegetables, root crops and water shortages lead to unbalanced diet and sanitation problems, which in turn can exacerbate health problems.⁴⁰

As presented in **Table 3** below, droughts trigger secondary shocks related to water supply, food supply, degradation and desertification of land and nutritional diseases due to major impacts on agriculture. Therefore, they also have direct social and economic impacts on the urban system.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
Drought 	<ul style="list-style-type: none"> • Water Crisis • Food Crisis • Land Degradation and Desertification • Nutritional diseases 	Supply Chain and Logistics	Water Resources, Food Resources
		Social Inclusion and Protection	Access to basic Social Services (Food)

Table 3: Secondary Shocks Triggered and Affected *Urban Elements* and Components by Drought.

4.1.3.4. Cyclone

As Port Vila is located within the South Pacific Convergence Zone and within the tropical cyclone belt, the city is particularly vulnerable to intense tropical storms. The frequency and intensity of these cyclones is anticipated to increase due to the effects of climate change.⁴¹

Cyclones affecting Port Vila were recorded in 1972 (TC Carlotta, TC Gail, TC June), 1987 (Uma), 1992 (TC Betsy, TC Fran), 1997 (TC Susan), 2001 (TC Paula, TC Sose), 2015 (TC Pam), and 2017 (TC Donna).

³⁸ Government of Australia. Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports.

³⁹ Secretariat of the Pacific Community (2012). Catalogue of Rivers for Pacific Islands.

⁴⁰ Government of Vanuatu (2008). NATIONAL DISASTER PLAN REVIEW OF OCTOBER 2009 – OCTOBER 2010. National Disaster Management Office: Ministry of Internal Affairs

Extremely destructive category 3-5 cyclones can cause serious damage to infrastructure and scatter debris across the city, limiting mobility and access to services.⁴² In some instances, such as during the initial days following TC Pam, certain areas had no access to electricity and fresh water supplies. In addition, severe damage to buildings can reduce access and safety, potentially limiting the operational capacity of government, health, aid and other vital services.⁴³

Strong winds, storm surges, and heavy rains from cyclones damage infrastructure, disrupt water, sanitation and electricity supply systems, degrade the coastal environment, cause flooding, landslides, and the exacerbation of health risks such as the increased possibility of parasitic epidemics.

According to UNDP, Vanuatu is well on its way to the elimination of the malaria parasite.⁴⁴ However, the impacts of climate change, increased intra-island migration, among other factors, may pose challenges to completing its eradication. In addition, other Port Vila faces other vulnerabilities to disease including Typhoid, Dengue (vector), and Cholera (bacterial).

The projected intense warming over the 21st century and the associated increasing frequencies and duration of hot weather events (e.g. tropical nights) is expected also to exacerbate the exposure to health-related hazards, particularly related to nutritional deficiencies, diarrheal and vector borne diseases, already prevalent in the target area under present-day climate conditions.⁴⁵

For malaria specifically, Githeko and Ndegwa (2001) find that higher temperatures can influence the timing and intensity of malaria transmission through the modification of the development speed of the parasite, the frequency of feeding by mosquitoes, and the time it takes malaria parasites to mature.⁴⁶

Secondary shocks as well as the *Urban Elements* and Components most affected by cyclones are presented in **Table 4** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
Cyclone 	<ul style="list-style-type: none"> Degradation of coastal environment 	Built Environment	Housing, Built Assets
	<ul style="list-style-type: none"> Flooding 	Ecology	Biodiversity and Green Areas
	<ul style="list-style-type: none"> Landslides 	Supply Chain and Logistics	Water Resources, Energy Resources, Food Supply, Logistics
	<ul style="list-style-type: none"> Breakdown of Supply Chains 	Basic Infrastructure	Water and Energy Supply, Solid Waste Management
	<ul style="list-style-type: none"> Increased Potential of Parasitic Epidemic 	Mobility	Urban and Inter-Regional Mobility

Table 4: Secondary Shocks Triggered and Affected *Urban Elements* and Components by Cyclones.

⁴¹ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

⁴² OCHA (2015). Vanuatu: Severe Tropical Cyclone Pam Situation Report No. 1. Extracted here: www.reliefweb.int/disaster/tc-2015-000020-vut.

⁴³ Government of Australia (1992). Tropical Storm Fran: Summary. Bureau of Meteorology. Can be extracted here: www.bom.gov.au/cyclone/history/fran.shtml

⁴⁴ UNDP (2018). Vanuatu Malaria Programme Review. Suva.

⁴⁵ Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Port Vila by the end of 21st Century.

⁴⁶ Githeko and Ndegwa (2001). Predicting malaria epidemics in the Kenyan highlands using climate data: a tool for decision makers. *W. Global Change & Human Health* (2001) 2: 54. [www.doi.org/10.1023/A:1011943131643](https://doi.org/10.1023/A:1011943131643)

4.1.3.3. Earthquake

As Vanuatu is located along the 'ring of fire', geologic and climatic hazards are a constant threat. The volcanic origins of the archipelago translate to a near-constant risk of volcanic eruptions, earthquakes, tsunamis and landslides. While there are no active volcanoes on Efate, where Port Vila is located, earthquakes and related tsunamis and landslides do indeed threaten the Vanuatu capital.

Despite the frequency of earthquakes which register in Port Vila, the intensity of the majority of earthquakes is quite low. However, the threat of more intense earthquakes, and associated tsunami wave action, remains. Accordingly, the Ministry of Health's 2003 policy on *Disaster Control, Coordination and Command Arrangements* addresses and plans for a variety of risks including earthquakes.⁴⁷

The largest earthquake recorded to date in the vicinity of Port Vila occurred in 2002. The earthquake was measured at a magnitude of 7.3 on the Richter Scale and was located 45 km west of Efate at a depth of 18 km. The earthquake generated a tsunami which struck Port Vila Harbour shortly after. The tsunami was measured at the height of only 0.8 meters – although eyewitnesses reported a maximum effect up to about 3 meters and had the wave not coincided with one of the lowest tides of the year, was large enough to have caused serious flooding of the central business district.⁴⁸

Vanuatu lies on the boundary between the Australian and Pacific tectonic plates, forming part of the Pacific Ring of Fire. Vanuatu is extremely susceptible to earthquakes, with thousands occurring since 1973 when global earthquake monitoring began.

Triggered secondary shocks include, most commonly, tsunamis, as well as flooding and landslides. In severe instances, a breakdown of supply chains, especially those ensuring the delivery of food, water, supplies, and fuel, may be severely impacted. These secondary shocks as well as the *Urban Elements* and *components* most affected by earthquakes are presented in **Table 5** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
Earthquake 	<ul style="list-style-type: none"> • Tsunamis • Landslides • Breakdown of Supply Chains • Flooding 	Built Environment	Urban Form
			Housing
			Built Assets
			Energy – Building Supply
		Basic Infrastructure	Energy Mobility Supply
			Water Supply
			Telecommunications
	Supply Chain & Logistics	Food Supply	

Table 5: Secondary Shocks Triggered and Affected *Urban Elements* and Components by Earthquakes.

⁴⁷ UNESCAP (2010). Vanuatu National Assessment Report: 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development.

⁴⁸ Government of Vanuatu. Assessment of the Port Vila Earthquake Vanuatu 2nd January 2002. Port Vila: National Advisory Board. Can be extracted here: www.nab.vu/assessment-port-vila-earthquake-vanuatu-2nd-january-2002

4.1.3.5. Food and Fuel Supply Crisis

Analysis of the market connectivity in Port Vila suggests the is highly dependent on external markets⁴⁹, for both maintaining demand for local services (through tourism) as well as providing needed imports such as diesel fuel, gasoline, construction materials, packaged foods, pharmaceuticals, and textiles. Such dependency increases the local economy's vulnerability to fluctuations in both the Port Vila and global economies.

The Global Food and Fuel Crisis of 2007, which was, in part, initiated by the global financial crisis, increased the cost of food and fuels in Vanuatu. While areas more dependent on traditional economic activities and subsistence agricultural practices were largely able to overcome the food crisis by growing more local foods, the Fuel Crisis of 2007 greatly affected transportation costs and energy prices in Port Vila. In fact, as commodity prices rose in 2007, rural populations greatly benefited from increased prices for copra on the global market. In recent years, the price of copra has normalised.

The impacts of Fuel Crisis of 2007, on the other hand, were felt in the transportation and in household budgets in relation to energy process for a longer period. Given the relatively small position of Vanuatu on the global energy market, there is little the government, businesses or individuals can do to respond to the increased cost of transportation with regards to fuel for boats, trucks and aircraft. With regards to electricity generation, while nationally, Vanuatu is working generate more and more of its energy from coconut oil, wind generators and hydro power, Port Vila remains dependent on imported diesel and therefore susceptible to the fluctuations of global fuel prices.⁵⁰

Secondary shocks that can be triggered by food or fuel supply crises include, most notably, decreased access to foods, which can lead to malnutrition. In addition, secondary shocks can include severe impacts on labour markets such as increased unemployment rates stemming from decreased economic activity and fiscal impacts such inflationary dynamics, decreased fiscal expenditure flexibility as more resources are required to pay for needed fuel costs or subsidized food costs for the local population. In the case of Port Vila, given the integral role that the tourism and construction sectors play in the overall economy, changes in the global market could result in significant decreases in activity across these industries. For instance, a spike in fuel costs may deter travellers planning to visit Port Vila (both by plane and boat) as well as reduce the financial feasibility of key tourism offerings in and around Port Vila (e.g. boat or bus, air conditioning, etc.). The discussed secondary shocks as well as the *Urban Elements* and Components most affected by food and fuel supply crises are presented in **Table 6** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
Food and Fuel Crises 	<ul style="list-style-type: none"> Decreased Mobility 	Basic Infrastructure	Energy – Building Supply
			Energy Mobility Supply
	<ul style="list-style-type: none"> Malnutrition Increased Unemployment Hindered Economic Activity 	Economy	Fiscal Stability and Municipal Finance
			Local Economic Structure
			Market Connectivity
	<ul style="list-style-type: none"> Inflation 	Supply Chain & Logistics	Food Supply
			Energy Supply
		Social Inclusion and Protection	Basic Social Services - Health
			Basic Social Services - Food

Table 6: Secondary Shocks Triggered and Affected *Urban Elements* and Components by Food and Fuel Supply Crises.

⁴⁹ MIT Atlas on economic complexity (2018). Vanuatu. www.atlas.media.mit.edu/en/profile/country/vut

⁵⁰ UNESCAP (2010). Vanuatu National Assessment Report: 5 Year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for Sustainable Development.

4.1.4. The State of Risk Reduction Measures in Port Vila

This section analyses data collected through the Urban Context (refer to **Chapter 1: Port Vila in Context**) concerned with measures and policies available at the local level, which are conducive to decreasing the risk of adverse events such as shocks. Particularly, this section examines existing risk reduction measures in regard to the identified priority shocks in Port Vila.

4.1.4.1. Risk Assessment

Risk assessment is defined as qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend.⁵¹ Ideally, a risk assessment process would include hazard analysis, exposure assessment, and vulnerability analysis and capacity assessment.

Data show that in general, regular and comprehensive risk assessment procedures, that include assessing and analysing vulnerability and available capacity to the hazards posed, are lacking in Vanuatu. The last risk assessment conducted in Port Vila was in 2016, focusing predominantly on natural hazards (cyclones, earthquake, and tsunami as well as long onset hazards such as drought). Nonetheless, there have been growing efforts on developing hazard monitoring and risk mapping mechanisms and tools over the last five years. The Vanuatu Meteorology and Geo-Hazards Department (VMGD) - the country's scientific agency for risk monitoring within the Ministry of Climate Change, undertakes, on regular basis, meteorological forecasting, seismic and volcanic monitoring.⁵² For instance, during the rainfall seasons (between November and April) each year, the VMGD publishes Tropical Cyclone Outlook twice a day at 6am and 6pm. The country's central VMGD station in Port Vila draws on a number of meteorology stations distributed across the country – each province has its own monitoring station – for weather and meteorological data.

Given the increasing frequency and growing risk of fuel and food supply in Vanuatu in general, the central government has been notably working over the recent years on monitoring and assessing the risk of such events. In fact the government has been assessing the risk of food and fuel supply shortage on yearly basis over the past four years.⁵³

Similarly, risk-related data management is getting considerable attention by the NDMO – the National Disaster Management Office, which has founded the VHT – Vanuatu Humanitarian Team, that coordinates the work of agencies working on producing risk data and maps, including GIS data, on quarterly basis. A range of partner organizations and agencies as well as ministries have access to NDMO's data per a memorandum of understanding on data sharing.

4.1.4.2. Early Warning system

Early Warning System is integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.⁵⁴ Three key elements contribute to the enhancement of an early warning system's performance: monitoring and warning services, response capability and warning dissemination and communication.

Developing a multi-hazard early warning system has been a key national priority for the government of Vanuatu, as part of its Disaster risk management agenda.⁵⁵ The national government, through the NDMO, is working with multiple

⁵¹ United Nations Office for Disaster Risk Reduction (UNDRR) (2017), Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

⁵² NDMO (2017). The Republic of Vanuatu: Country Preparedness Package.

⁵³ Ibid

⁵⁴ United Nations Office for Disaster Risk Reduction (UNDRR) (2017), Report of the open-ended

⁵⁵ www.gfdr.org/en/vanuatu

international organizations and NGOs on developing such a system, with a particular focus on natural metrological (tropical cyclones) and seismic activities including tsunamis.⁵⁶ Data show that, in general, securing funds, offered by international actors, for early warning system is attainable.

By installing the required equipment, good levels of risk monitoring have been achieved (as explained previously in Risk Assessment) on the country level, with the aim of strengthening preparedness and response. This is further supplemented by a network of communication that is managed by the Vanuatu National Emergency Telecommunications Cluster (NETC). The cluster uses national radio, television, SMS messaging and the NDMO's website for communicating with the public in the case of a hazard.⁵⁷ Gathered data indicate notable level of community response to warning and alerts.

4.1.4.3. Risk management

Is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.⁵⁸ Measure considered for evaluation under risk management include those described as long-term – Mitigation – and those aimed at immediate emergency response including preparedness and contingency planning. Mitigation is the lessening or minimizing of the adverse impacts of a hazardous event, while preparedness is the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.⁵⁹

Vanuatu, through its Climate Change and Disaster Reduction Policy (2016 to 2030), aims at bridging the gap between disaster preparedness, response and recovery, and sustainable development policies and agenda. Most of the efforts, however, under risk management for meteorological hazards and seismic activities are focused on disaster preparedness and response, while relatively little attention is given to long-term mitigation measures.

The national government, through The Food Security and Agriculture Cluster (FSAC) that is managed by The Ministry of Agriculture, Livestock, Forestry, Fisheries and Biosecurity (MALFFB) supports and advocate for efforts that have the potential to decrease the impacts of climate change on food security and the livelihood of the most vulnerable group in this sector. The FSAC, coordinates the work of and partner with national and international actors to ensure the provision of timely assistance to those most affected.⁶⁰

As for preparedness and emergency response, NAB - the national advisor board for disaster *risk reduction* coordinates, advices and manage the development of relevant plans, policies and strategies. It also ensures that different plans are reviewed and updated regularly, such as the Cyclone support Plan which is reviewed annually.⁶¹

Further, the Health and Nutrition cluster and Ministry of Health (MOH), working closely with World Health Organization (WHO) and UNICEF, coordinates the work of national and international actors to decrease mortality and morbidity through timely and equitable delivery of preventive and curative health care.⁶²

⁵⁶ www.eliefweb.int/report/vanuatu/undp-support-vanuatu-government-strengthening-early-warning-systems-monitor-ambae

⁵⁷ The republic of Vanuatu, Country preparedness package.

⁵⁸ United Nations Office for Disaster Risk Reduction (UNDRR) (2017), Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

⁵⁹ Ibid

⁶⁰ Ibid

⁶¹ The republic of Vanuatu, Country preparedness package

⁶² Ibid

4.1.4.4. Recovery

Data show that Pre-Disaster Recovery Planning efforts are lacking in Vanuatu in general, the efforts are rather focused on Post-disaster emergency response and recovery. The lead institution responsible for coordinating recovery activities following an event is the NDMO. The Vanuatu's Post-Disaster Assessment Guidelines document provides procedures on multi-sectoral assessments following hazardous events, including aerial assessments in the aftermath of medium to large-scale events. While marked efforts have been made in building advanced and digital databases and tools, technical capacities to carry out such activities are still limited.

Financing recovery efforts is made through two main mechanisms. The National Emergency Fund, up to 25 million Vatu, is released following the recommendation of the NDC and the Prime minister. The second funding mechanism is released in cases when State of Emergency is declared, whereby the country's Disaster Fund is provided based on the recommendation of the NAB and the Prime Minister. Additionally, international funds tracking is enabled through a number of partnerships that the government of Vanuatu has established, such as the FRANZA (France, Australia, New Zealand⁶³).

4.1.5. State of National and local policies in relation with the risk of shocks

The Republic of Vanuatu's National Disaster Act 1000 constitutes the country's framework for disaster response. It represents the legal basis for the provision of emergency funds and allocates power to the National Disaster Committee (NDC) and the National Disaster Management Office (NDMO) to manage and coordinate disaster response in Vanuatu.

In addition, the National Advisory Board (NAB) was found as part of the countries to Meteorology, Geological Hazards and Climate Change Act of 2016, which established the framework for forecasting and hazards.

Following tropical cyclone Pam in 2015, Vanuatu adopted national standing clusters to be responsible of working with national, international actors and humanitarian agencies on developing disaster preparedness strategy and its implementation. This system is comprised of eight active clusters: Shelter, Food Security and Agriculture, Wash; Gender and Protection, Health & Nutrition, ETC, Logistics, and Education. Each cluster is co-led by a respective government agency and humanitarian agency. Clusters bring together partners from the public sector, private sector, humanitarian agency and community groups. The NDMO chairs the Inter-Cluster Group.

On the province level, Vanuatu has six Provincial Disaster Committees (PDCs) which coordinate disaster preparedness and response on the provincial level, supported by provincial disaster plans. This structure is further supported by more than 100 Community Disaster Committees (CDCs) which provide response coordination the community level. These committees work with local councils which report to (PDCs).

Based on the above structure, it can be seen, that while a well-connected structure of national, provincial and local actors, together with international actors, has been established in Vanuatu for disaster risk management and response, the planning and setting strategies roles are still mainly exercised by the central government, whereas local actors are mostly involved in implementing preparedness and response activities. It is hard to see the extent to which actors at lower levels of this structure contribute through feedback and participation to the development and improvement of provincial and national disaster risk reduction plans and strategies.

⁶³ Ibid

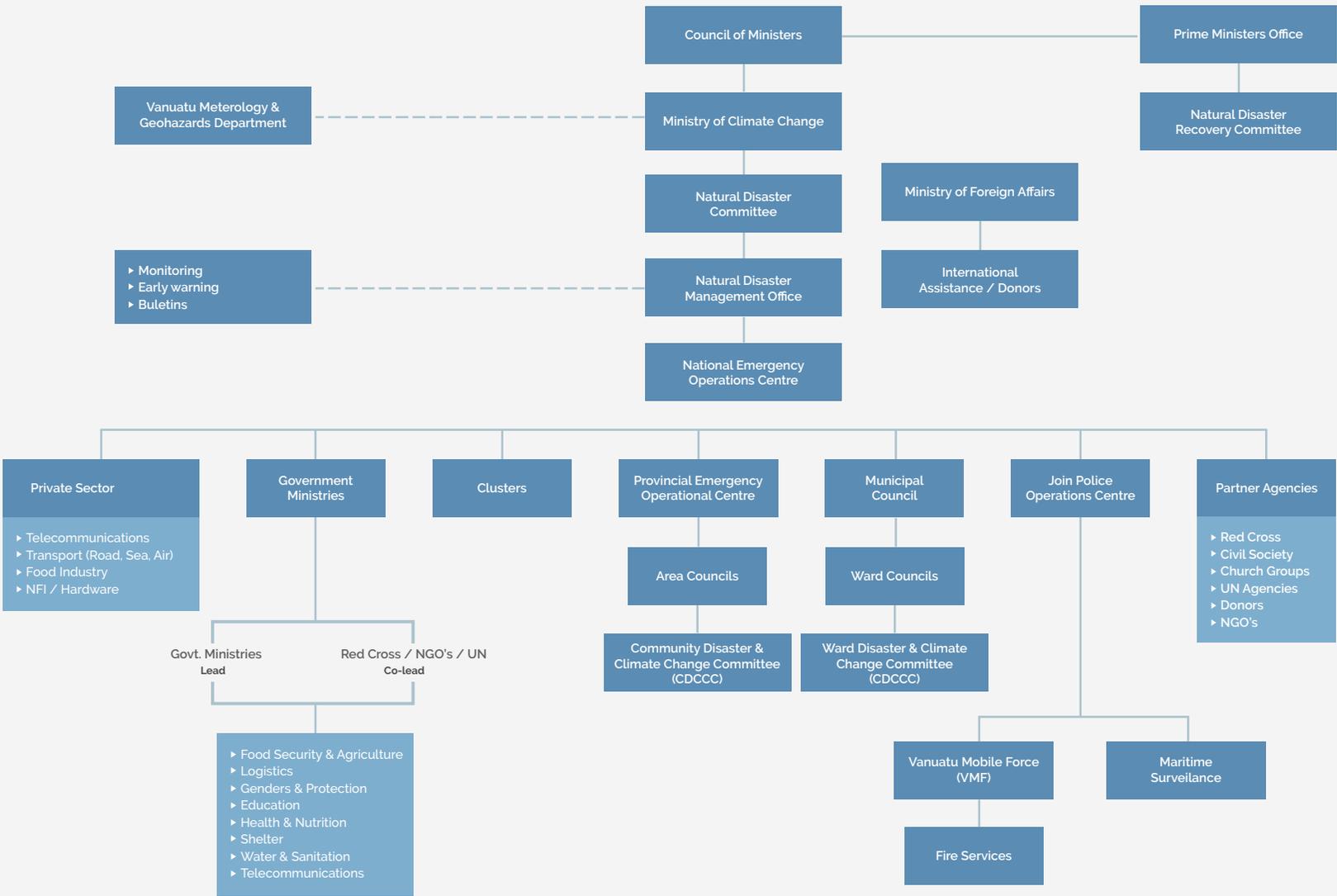


Figure 3: National Coordination Structure. Source: NDMO (2017). The republic of Vanuatu, Country preparedness package.

4.1.4. Key Findings

Given Vanuatu's location as one of the most areas prone to natural hazards, namely cyclones, earthquake and tsunami apart from the growing risk of climate change effects, there is a significant presence by international development and humanitarian agencies working actively on building the country's capacity for reducing disaster risks. The national government as the major actor for planning, managing and coordinating DRR efforts at different levels, including the local level, is actively partnering with a variety of regional and international actors in delivering its goals and objectives. Nonetheless, according to GFDRR⁶⁴, a number of challenges face the country in this regard, mainly weak institutional capacity, limited human resources and inadequate access to risk information.

As explained previously, efforts are disproportionately given to preparedness and emergency response activities for natural hazards, while relatively less has been made in terms of long-term mitigation measures, especially for non-natural hazards, such as health-related ones and food and fuel supply crisis.

⁶⁴ www.gfdr.org/en/vanuatu

**Key Messages:
Climate Change**



Key messages

Future climate change, expected impacts and vulnerability in Port Vila by the end of the 21st century

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Key messages

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Key messages

1 Future air temperature and precipitation change

Port Vila¹, the capital of the Republic of Vanuatu, is a relatively densely populated city concentrating about 19% of the total population of the country and is located on the south-west coast of the island Efate at 59 m a.s.l. The climate of the city is tropical rainforest or equatorial (*Af* in the Koeppen-Geiger classification), with two distinct seasons: the dry season (May-October) and the wet season (November-April), also known as cyclone season (peak activity from December to February). Through its location within the South Pacific Convergence Zone and within the Pacific Cyclone Belt, the city is particularly vulnerable to intense tropical storms, but also to major earthquakes and tsunamis due to its location within the New Hebrides Subduction Zone (Shorten et al., 2004).

1.1 18 GCM ensemble projections

1.1.1 Air Temperature

- *Climate of Port Vila is projected to become hotter than today by the end of the 21st century, under both selected RCPs. Mean annual temperature is estimated to increase by as much as 2 °C under RCP4.5 and nearly 4 °C under RCP8.5. In the worst case scenario (RCP8.5), the climate warming is particularly intense after 2070, when the annual temperature is estimated to reach almost 29 °C.*
- *Throughout the year, air temperature is expected to increase the most from August to October, under both scenarios, especially in the far-future. In the moderate scenario RCP4.5, the positive temperature changes are estimated at fairly comparable magnitudes of around 1 °C from January to March, August to October, as well as in December, while in the far-future, the distribution of magnitudes throughout the year highlights a more intense warming concentrated mainly during the August-October interval (with an increase of more than 2 °C). In the worst-case scenario (RCP8.5), the changing monthly patterns are similar to RCP4.5 but suggests a visible intensified process after 2070, reaching almost 4 °C from August to October or exceeding 3 °C extensively from December to April.*

¹ <http://urbanresiliencehub.org/?s=Port+Vila>

Key messages

- The variation of the projected monthly air temperature in Port Vila over the 21st century under different climate scenarios is shown in Figure 1.

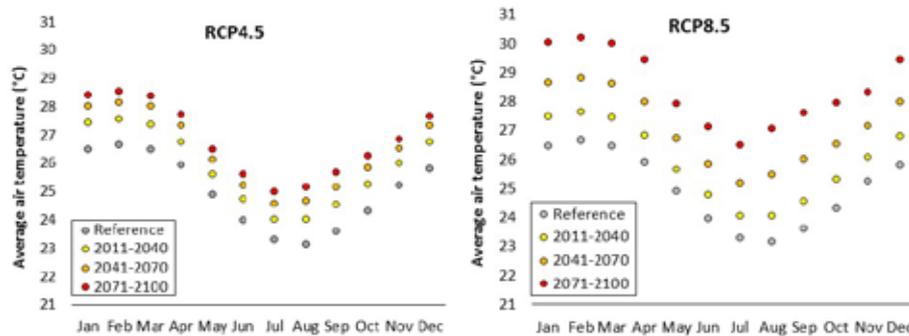


Figure 1: Expected changes in the monthly air temperature in the Port Vila City by 2100 under RCP4.5 (left) and RCP8.5 (right).

- There is a great asymmetry in the diurnal warming in the area of Port Vila, with stronger daytime warming than night-time warming on the annual scale. This asymmetric diurnal temperature change pattern maintains throughout the year in some distinct months or intervals:
 - In RCP4.5: maximum temperature is projected to increase by up to 1°C more than minimum temperature from February to May, in July-August, as well as in December. The rest of the year both daytime and night-time temperatures are projected to rise at comparable magnitudes. Most increase in maximum temperature in the target area is expected in the far-future (2071-2100) in February, July and August, with an increase of up to 3°C, while strongest warming by minimum temperatures is projected for January, February, with increase of about 2°C.
 - In RCP8.5: maximum temperature is likely to increase the most in February-March no more than 6°C in the mid-future and 8°C in the far-future. Comparatively, minimum temperature is projected to rise the most by 2100, with an increase of 4°C, in January-February, August-October and in December. Generally, daytime warming surpasses night-time warming only in February-March, with an increase of less than 2°C in the near-future, less than 3°C in the mid-future, or up to 4°C in the far-future. Over the rest of the year, daytime and night-time temperature increases at comparable magnitudes in all future time-intervals.

Key messages

1.1.2 Precipitation

- Port Vila is a hot and humid city with annual precipitation of over 2,300 mm. In the present-day climate, the city is affected by frequent heavy rainfalls throughout the year (even during the dry season). Most precipitation amount accumulates during the wet season (November-April), overlapping cyclone season, with maximum precipitation levels in March. Over the 21st century, change signal in precipitation intensity (mm/day) is mixed, but positive changes are prevalent throughout the year under both RCPs (Figure 2:).
- In RCP4.5: precipitation intensity in the target area is expected to increase over the entire wet season, starting from September until March. Despite this clear trend sign, the projected changes are slight-to-moderate and they do not exceed, in general, 10% relative to the reference period. Expected peak increases in the area are likely in the far-future and they are specific mostly to January and September with expected increases of approximately 10%. During the dry season (May-October), both increases and decreases in precipitation intensity have been projected and they were estimated to: up to +5% in June (near-future) and +6...+12% in September-October; and decreases of about -6% in May (over the mid- and far-future).
- In RCP8.5: positive change signal strengthens over the wet season, with peak magnitudes expected in the far-future in January and February (19%). Over the dry season, slight increases are projected for September and October (about 12%), as well as for June (up to 4%). For the dry season, negative changes persist in May and July and are comparable to those estimated under RCP4.5.
- Projected positive signal in precipitation intensity over the wet season shows in general a great robustness (by means of agreement in trend sign between GCM ensemble members). Least robust changes, based on ensemble member, estimated equal chances of both increase and decrease, and are specific to the following months: September (2011-2040/RCP4.5); June, August and November (2011-2040/RCP8.5); March, September and November (2041-2070/RCP4.5); August (2041-2070/RCP8.5); April, June (2071-2100, RCP4.5); and July, August, November (2071-2100, RCP8.5).

Key messages

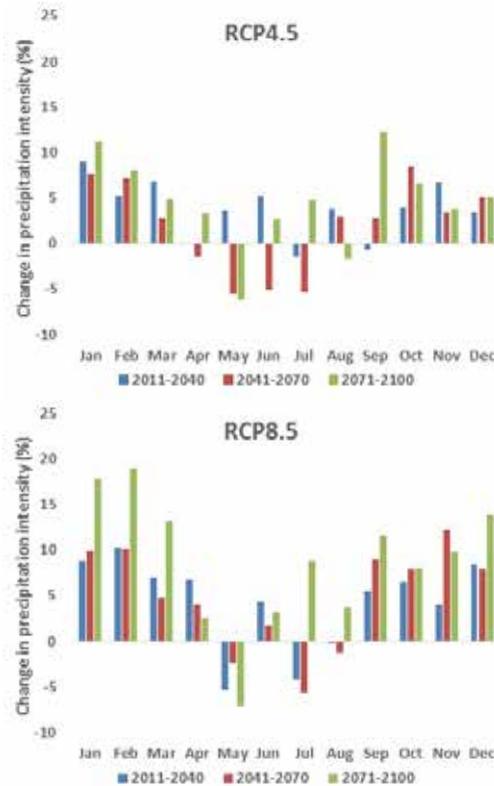


Figure 2: Projected change in precipitation intensity (mm/day) in Port Vila City by the end of the 21st century based on the simulations of 18 GCMs (RCP4.5 and RCP8.5).

2 Future changes in climate extremes

2.1 Temperature extremes

- A slight-to-moderate increase in the projected number of tropical nights (daily minimum temperatures above 20°C) during the June-October interval, overlapping most of the cool season, suggesting a reduction of thermal night-time bioclimatic comfort in Port Vila. Expected increases are generally larger in the mid- and far-future in all months of this interval, with peak values in August (see Figure 3: 3), of 9-10% in RCP4.5 and of about 11% in RCP8.5. In the other months of this interval, projected increase are limited to less than 5%, even in the far-future and RCP8.5, except for in September (about 6% in both RCPs and over both mid- and far-future

Key messages

intervals). In the rest of the year (e.g. during the wet season: November-April) the projection suggests no change, with the frequency of such extremes and the associated thermal discomfort maintaining at high levels as during the present-day climate conditions.

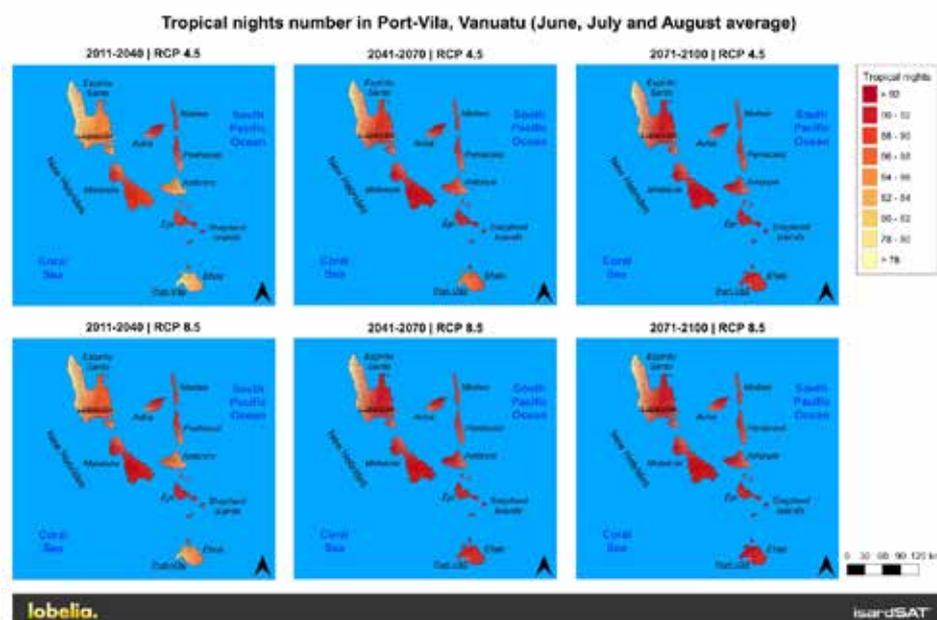


Figure 3: Projected number of tropical nights (June-August) in the near, mid and far-future periods under RCP4.5 (left) and RCP8.5 (right) scenarios.

3 Expected impacts and vulnerabilities

- Future climate change is expected to exacerbate the magnitude of some environmental impacts, already observed extensively in Port Vila under present-day climate conditions.
- Highly vulnerable to intense rainfalls, under the projected increased in precipitation intensity during the wet season and cyclone season by 2100 under both moderate (RCP4.5) and high (RCP8.5) emission scenarios, the river flooding and flash-flooding risk in the target area is expected to maintain or be exacerbated. Cumulated with

Key messages

the effects of the projected changes in sea level rise expected around Vanuatu, with 13 (by 2030) to 48 cm (by 2090) under RCP4.5 and 13 (by 2030) to 64 cm (by 2090) under RCP8.5 (BoM and CSIRO, 2014), the exposure to coastal flooding and coastal erosion is likely to increase significantly in the future.

- Projected intense warming in the area of Port Vila over the 21st century is likely to threaten the health of marine ecosystems and coral reefs, which are highly sensitive to temperature variability, and which are also a valuable food and tourism resource locally.
- The projected intense warming over the 21st century and the associated increasing frequencies and duration of hot weather events (e.g. tropical nights) is expected also to exacerbate the exposure to health-related hazards, particularly related to nutritional deficiencies, diarrheal and vector borne diseases, already prevalent in the target area under present-day climate conditions (URBAN RESILIENCE HUB²).

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² <http://urbanresiliencehub.org/?s=Port+Vila>



Annex VI

Local Government and Stakeholders

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List of acronyms and abbreviations

RAR-S	Recommended Actions for Resilience and Sustainability
CRPP	City Resilience Profiling Programme
CRPT	City Resilience Profiling Tool
PVMC	Port Vila Municipal Council
DLA	Department of Local Authority
MoIA	Ministry of Internal Affairs
MoL	Ministry of Lands
DoL	Department of Lands
UNELCO	Union Electrique du Vanuatu

Annex VI

Local Government and Stakeholders

This chapter provides a multi-level cross-cutting analysis of stakeholders contributing to the governance processes in Port Vila. It brings together all the relevant information in the *City Resilience Profiling Programme* (CRPP) that facilitates a better understanding of the urban system as a whole from a governance perspective. The local government, as UN-Habitat's main counterpart in the *City Resilience Profiling Tool* (CRPT) and the city's main stakeholders charged with delivering quality services for all its inhabitants, constitutes the backbone for analysing urban governance.

The purpose of this analysis is to get to know the concrete realities on the ground through an exhaustive analysis of actors, who actively work in different aspects of the urban system, both in normal circumstances and in crisis situations, and thus be able to have information to formulate *Recommended Actions for Resilience and Sustainability* (RAR-S). The study considers the full picture of the Local Government from the decision-making, implementation, and planning processes, and incorporates a stakeholder mapping attempting to capture the factual interactions among relevant actors.

For the purpose of this analysis, stakeholders have been prioritised and classified among the eight *Urban Elements* and topics related to risk reduction. This includes 60% public entities, 17% private entities, 12% civil society entities and 10% other major institutions. Likewise, all units and/or departments, along with their competencies, within the local government have been analysed and considered for the preparation of this report.

Local Government

This section aims to examine the structure, roles, and responsibilities of the local government, in this case Port Vila Municipal Council (PVMC), and to understand how it can effectively work towards building resilience. It provides contextual information such as the place of the local government in the overall government structure, its internal structure, and its competencies, including budgeting processes. As the first point of contact between the city's inhabitants and the government, it sets the stage for further analysis of the local government's relationship with stakeholders mapped in different aspects of the urban system, as well as those related to risk reduction measures.

The data collection and analysis period for Port Vila concluded in early 2019. Since then, two workshops and, following placement of the Port Vila focal point within an office at the PVMC, a series of informal consultations between the Port Vila focal point and members of the PVMC have taken place. Discussions between the PVMC and UN-Habitat have continued throughout the writing of the RAR-S Report, with particular attention being given to preparing a preliminary cost-benefit analysis in relation to the *Recommended Actions for Resilience and Sustainability*. As a part of this effort, which has been largely facilitated by the focal point, a continued analysis of stakeholder roles, interconnectivity, and capacities has been conducted.

Legal Framework

The Port Vila Municipal Council (PVMC) was established in accordance with the Port Vila Municipal Council Act, CAP 126 of 1980, which provides a basis for the composition, election, and powers of the PVMC. Of particular relevance to this report, the ultimate owner of the Council is the Vanuatu Government.

The governing body of the PVMC is the Council and is made up of 17 Councillors. The Councillors are elected pursuant to Part Two, section 6 of the Municipalities Act CAP 126.

The senior management group comprises of the Town Clerk, the Deputy Town Clerk, the Treasurer and 3 division heads and 13 supervisors.

The main legislation for all authorities are:	<ul style="list-style-type: none"> ● Decentralisation Act 201351.2b (Cap. 230) ● Municipalities Act 198851.2c (Cap. 126)
Other relevant legislation includes:	<ul style="list-style-type: none"> ● Vanuatu Physical Planning Act 1986 ● Leadership Code Act 1999 (Cap. 240)

Organisational Structure

The Department of Local Authorities (DLA) within the Ministry of Internal Affairs is responsible for overseeing local government. However, the Port Vila Municipal Council holds jurisdiction over the formal municipal area of the city. The municipality is governed by 17 representatives spread across five wards. A detailed diagram of the local government's composition can be seen in **Figure 1** below.

The PVMC decision-making relies upon thematic committees that make recommendations to the full council for approval. The Mayor appoints chairpersons to head the overall administration of the council's portfolios. The formal committees of council are Finance and Town Planning with various other ad hoc committees.

In addition to the PVMC, Ward Councils, which were established in July 2014, provide more direct interaction between local government and Port Vila's inhabitants as well as integrate a range of key non-governmental stakeholders into the decision-making process. Ward Councils are comprised of representatives from the Council of Chiefs, the Vanuatu National Women's Council, Church Groups, Youth Organisations and the Disabled Persons Association of Vanuatu. Ward Councils are elected through an open constituency system for a term of four years, each ward elects two representatives who in turn elect the mayor.

The Administration is responsible for the control, management and administration of the municipality. Specific competencies include developing, controlling and managing land taken on lease from any statutory land authority including any housing estates thereon, managing refuse collection and disposal, overseeing cemeteries, maintenance of local roads, parks and open spaces, and the promotion of tourism.

Key activities undertaken by the Council are:

- Control, manage and administer the municipality
- Develop, control and manage land taken on lease from any statutory land authority
- Maintenance of public areas (parks and public halls)
- Keeping Port Vila clean and tidy
- Managing and collecting property taxes

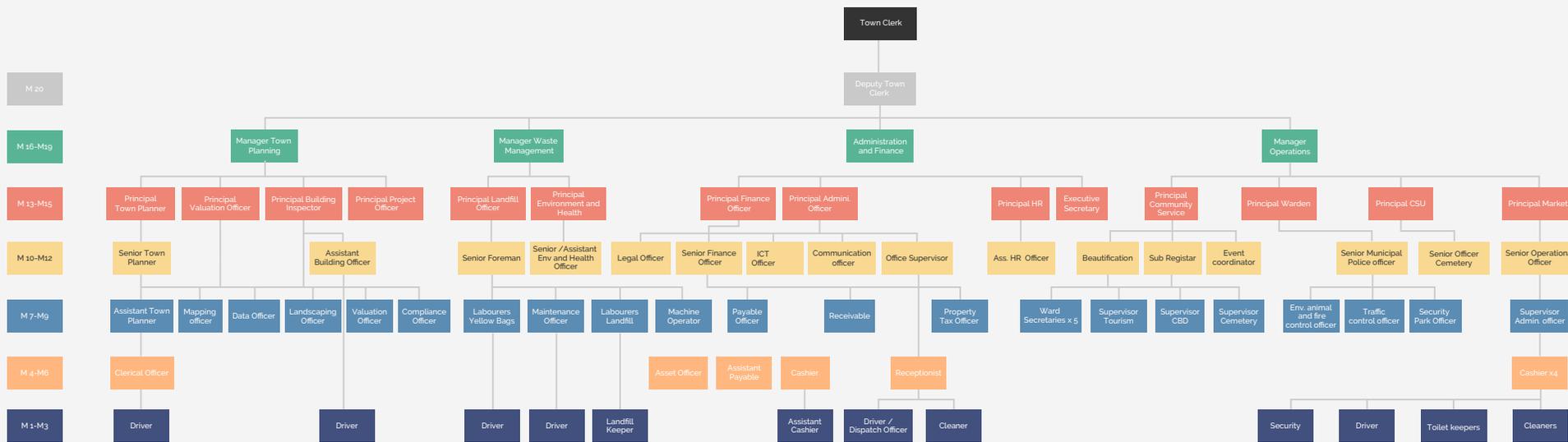


Figure 1: Diagram of Local Government Administrative Structure.

Budget Competencies

The budget is prepared on a cash basis when cash is expected to be received and paid. The classification of the budget is prepared on the common revenue sources and expenditure is classified on the nature of the expenditure normally incurred by the Council. Capital expenditure is treated as part of normal operational expenditure.

The approved budget is developed on the same accounting basis, classification basis, and for the same period as the financial statements. There is no donor funding during the financial year.

Revenue streams include property taxes, which account for 55% of the Councils revenue, building permits, fines for breach of bye-laws, public vehicle permit, traffic fines, and garbage collection (sale of yellow bags), berth fees, market house and burial fees. These other revenue sources make up the remaining 45%.

Own capital revenues include:

- Property tax
- Provision of building permits
- Provision of municipal business licences
- Responsible for the collection of stallholder fees from the Port Vila Market House (100 vendors stalls)

While the Vanuatu Government does not allocate separate funding from its budget to PVMC to undertake activities, it does however pay the salaries of the town planner and town clerk, are seconded from the Public Service Commission and are paid civil servants.

Stakeholders

Stakeholders are entities that affect or are affected by changes in the urban system and act on different aspects with varying roles and responsibilities. A conscious effort to create a comprehensive map of these actors was undertaken as part of the CRPT implementation in Port Vila. Information was collected on each stakeholder's type, responsibilities towards specific aspects of the urban system (*Urban Elements*), and relationships with the local government and other stakeholders.

Types of stakeholders analysed include:

- Local Government: As the main entity, in addition to its composite parts, its role in each of the *Urban Elements* is analysed.
- Public Sector Entities: relevant Local, Supra-local, and National Government entities.
- Private Sector Entities: for-profit enterprises, companies, or businesses (e.g., service providers and private research institutions), from the local to the international level.
- Civil Society Entities: civil society organisations (e.g. neighbourhood and cultural associations, charitable and local non-governmental organisations), traditional and community councils, amongst others.
- Other Relevant Institutions: non-governmental foundations, organisations, academia, financial institutions, and public-private consortiums; multilateral organisations (e.g. ADB, WB, United Nations); international government (e.g. DFAT).

This mapping process was carried out through interviews and the revision of several types of documents: studies, programs, initiatives, and/or existing projects. Lists of stakeholders were drawn up by *element* and field visits were made to several of them. Likewise, in the process of data collection for the *Urban Elements* and *Risk Reduction Measures*, the mapping identified and expanded information on the actors.

This stakeholder mapping and analysis helps to identify key actors and broaden the understanding of their possibilities for actions for the recovery of the city at critical moments, building resilience and moving towards sustainable development in Port Vila. It is intended to identify possible gaps and improve their coordination, thus avoiding duplication

of efforts and stimulating synergies between actors.

The influence of these actors with respect to the resilience processes has been analysed in terms of:

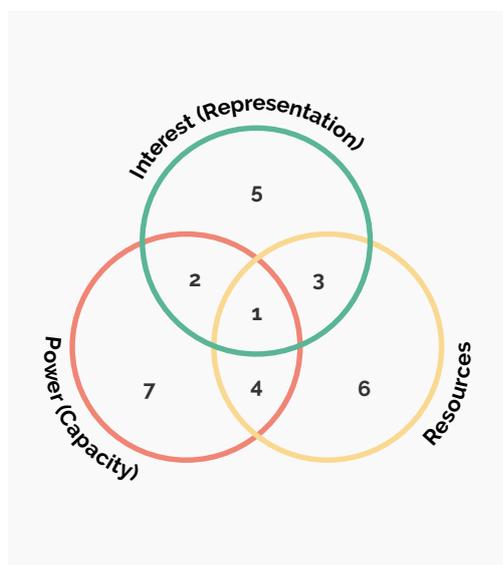
1. **Power and capacity** (political, legal, social capital, knowledge and/or expertise)
2. **Interest and representation** (be it for the success and/or failure of an intervention, with an expected strong impact on the stakeholder)
3. **Resources** (financial capacity and have assets that can support implementation).

This process is derived from local knowledge and the practice of various stakeholders studied throughout the tool implementation process.

Taking this criteria into consideration and based on the analysis of the effective interactions among themselves and with the Local Government, from a resilience perspective, identified stakeholders were classified as essential or complementary for resilience.

- Essential Stakeholders are directly linked to the aspect considered and possess a combination of power (capacity), interest (representation) and resources (zones 1 to 4), which make them crucial for action. The detailed analysis of stakeholders in the following sections focuses primarily on these essential stakeholders.
- Complementary Stakeholders. The stakeholders for resilience may not always be directly related to the Local and/or National Government, but they can influence and be influenced by its operation and outcomes. Complementary stakeholders are those that have less direct influence (zones 5 to 7). Considering their type of influence, Resilience reinforcement actions actively involved in the process can be supported or improved.

A synthesis is presented in **Figure 2** below for each *Urban Element*, exposing the following aspects:



Zone 1	most influential stakeholders (must be main partner).
Zone 2	Has power and interest but lacks resources (finance!).
Zone 3	Has resources and interest but lacks power (must be empowered).
Zone 4	Has power and resources but lacks interest (Caution: possible source of obstructions).
Zone 5	Has interest (they are good volunteers).
Zone 6	Has resources (must be approached to promote their participation).
Zone 7	Has power (It is important, mainly if it comes to political power).

Figure 2: Diagram of Actor's Influence Analysis. Source: CRPP (2019).

Participation of the Local Government and Municipal entities particularly in the <i>Urban Element</i>
Participation of stakeholders and their influence on a particular <i>Urban Element</i>
What is needed from the stakeholders in the city
Main relation of the stakeholders with other <i>Urban Elements</i>

Stakeholders per Urban Element

The stakeholders that have been related to each of the *Urban Elements* do not present all the actors identified and/or analysed, but rather the prioritized ones considering their impact and relevance in each one of the *Urban Elements*. Several of these relevant stakeholders were consulted during the data collection process (the full list of stakeholders analysed is presented in **Appendix 2. List of Stakeholders**).

In some elements, as is the case of *Built Environment*, there are a diversity of stakeholders that have been identified by the Town Planning Unit.

Each of the *Urban Elements* and risks present the stakeholder analysis. Lastly, the findings and problems derived from the analysis are detailed.

PVMC has primary responsibility for planning and enforcing development regulations in Port Vila; the Shefa Provincial Government has responsibility for the Greater Port Vila area. Cooperation between Port Vila Municipality and Shefa Province is limited despite the existence of a jointly signed Memorandum of Understanding. Disagreements over the placement of the municipal boundary and its effect on the collection of business and property taxes tend to dominate. Boundary changes are viewed with suspicion as any expansion of the municipal boundary would mean a reduction in the amount of property taxes collected by the Shefa Provincial Government Council. This breakdown in cooperation limits the ability of both local governments to deliver services and make improvements to infrastructure and deal with cross boundary planning issues especially in informal settlement areas.

Built Environment (BE)	
Summary by Urban Element – Built Environment	
Participation of the Local Government and entities	<p>PVMC holds the authority over regulations and urban plans. The Town Planner is responsible for proposing similar regulations and managing the urban land and its corresponding records. Whilst the National Government shares the regulation and has more superior resources than the local government, the PVMC is still regarded as a Zone 1 Stakeholders (power, resources and representation) + zone 2 Stakeholder (has power and interest but lacks resources finance).</p> <ul style="list-style-type: none"> ● Ministry of Lands and Natural Resources (MoL) ● Department of Lands (DoL) ● Department of Local Authority (DLA)
Participation of stakeholders and their influence on the element	<p>Areas of ongoing legislative and/or policy improvement include the National Building Code and associated legislature, subdivision legislation (targeted at reducing development in exposed areas), and development of a Port Vila Land Use Plan. However, these documents have been under development for a prolonged period of time, with no clear timelines for their finalisation, gazetting and implementation. More broadly, implementation was a key gap, with policies and stakeholder agencies perceived as being disjointed.</p>
What is needed from the stakeholders in the city	<p>PVMC holds the primary responsibility for planning and enforcing development regulations in urban spaces. The local government needs to strengthen existing coordination mechanisms and encourage the involvement of all key stakeholders from the early stage of planning through implementation.</p> <p>The development of a position to co-ordinate issues across municipal to other government departments would greatly assist.</p>
Main relation of the stakeholders with other Urban Elements	<p>The actors in the urban environment, especially those of the National Government (ministerial departments MoL and DLA) have a relevant relation; in Basic Infrastructure and Mobility.</p>

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- - - - Legally Engages
- - - - - Communicates
- No Legal Engagement

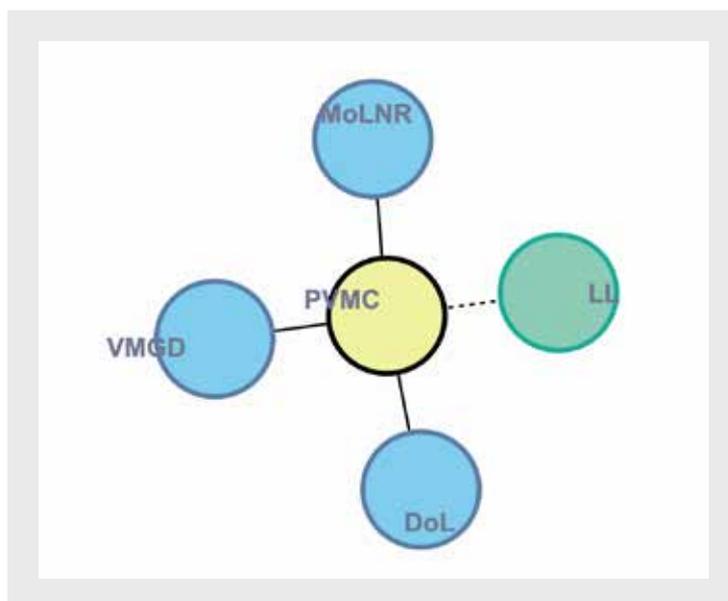


Figure 3: Map of the Actors Involved in the Supply Chain and Logistics Element. Source: CRPT (2019).

Supply Chain and Logistics (SC&L)

Summary by Urban Element - Supply Chain and Logistics

Participation of the Local Government and entities

The Municipality does not have direct authority over the management of the supply chain of water, energy, and/or food. The main stakeholders in this element are the private sector.

- Union Electrique du Vanuatu's (UNELCO)

With regards to local logistics in the consolidated urban area, the Municipality and national government share the maintenance of roads improvements.

Participation of stakeholders and their influence on the element

The supply chains of energy and water in Port Vila is supplied under UNELCO private concession.

In the food logistics chain, the management processes, monitoring and/or direct management are not identified. The participation of actors of various capacities, installed and operational, allows to have various associated services (formal/informal markets with large operators, intermediate markets and operators).

What is needed from the stakeholders in the city

Stakeholder involvement needs to be managed and lead by the The stakeholders also participate in the provision of services, as well as the evaluation of the quality of services provided. What the city needs is mainly investment programs that have been designed by the same actors, are fulfilled, that ensure the sustainability of the service, and that provide the monitoring and maintenance of themselves.

Main relation of the stakeholders with other Urban Elements

This *element* has a direct relationship with Basic Infrastructure, as the implementation of services need to get approval from town planning.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- Legally Engages
- Communicates
- No Legal Engagement

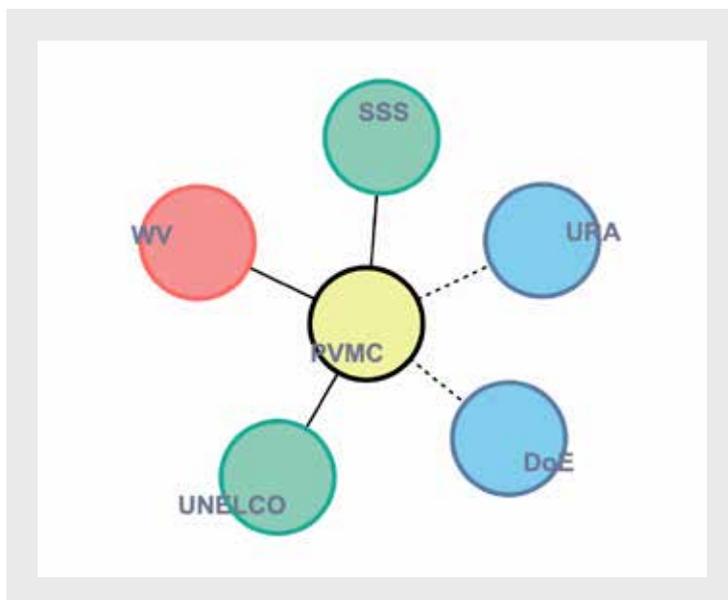


Figure 4: Map of the Actors Involved in the *Supply Chain and Logistics Element*. Source: CRPT (2019).

Basic Infrastructure (BI)

Summary by Urban Element - Basic Infrastructure

Participation of the Local Government and entities

The Municipality has the authority to manage solid waste collection.

- JICA
- NGO's
- UNELCO
- Department of Energy (DOE)
- URA
- Ministry of Internal Affairs (MiA)
- The Telecommunications, Radiocommunications and Broadcasting Regulator (TRBR)

Participation of stakeholders and their influence on the element

In the *Basic Infrastructure Element*, in the case of energy and water, the relevant stakeholder who has the resources and capacity, is UNELCO. The regulatory body that manages this stakeholder is within the national government. Clearly these are Zone 1 Stakeholders (power, resources and representation).

In the case of solid waste, the carries out the collection process and the management of the landfill. The Utilities Regulatory Authority (URA) oversees UNELCO's operations.

The water and sanitation sector is fragmented between three ministries and local agencies. Urban water supply is MIPU's responsibility with implementation under the provincial governments. Drainage and sanitation is under MIA with implementation also under the provincial government.

However, telecommunications have a wide and diverse range, The Telecommunications, Radio communications and Broadcasting Regulator (TRBR) regulates and establishes the policies, while the services have multiple and varied actors. This aspect allows to have in diverse and wider coverage services.

What is needed from the stakeholders in the city

The Local Government needs to strengthen the coordination processes with the entities responsible for energy and water, in order to contribute to the implementation of the improvements plans that have been communicated: upgrading and updating the energy distribution network and working on reducing water losses.

In the case of renewal/expansion of the water networks, coordination between the entities must be ensured so as not to repeatedly impact public roads, the urban economy and the well-being of the neighbours who inhabit/transit the intervention areas. The participation of the stakeholder in the municipal planning cycle is necessary, since sometimes stakeholders do not follow the local planning framework but their own priorities towards the development of their projects.

In the case of solid waste, the Municipality needs to strengthen their service and maintain a reliable schedule. Further capacity building is needed for the collectors to reduce spillage onto the streets at time of collection.

Finally, in regard to telecommunications, the city is being positively impacted in its services by the multiplicity of actors.

Main relation of the stakeholders with other Urban Elements

Due to the diversity and relevance of the Basic Infrastructure components, this *Urban Element* has a broad impact on other elements. One of the main relationships is with the UNELCO, as they are responsible for public lighting which has an impact on road and personal safety.

- ○ Public Entity
- ○ Private Entity
- ○ Civil Society Organization
- ○ Other Major Institution
- Local Government

- Formal Partnership
- - - - Legally Engages
- · - · - · Communicates
- · · · · No Legal Engagement

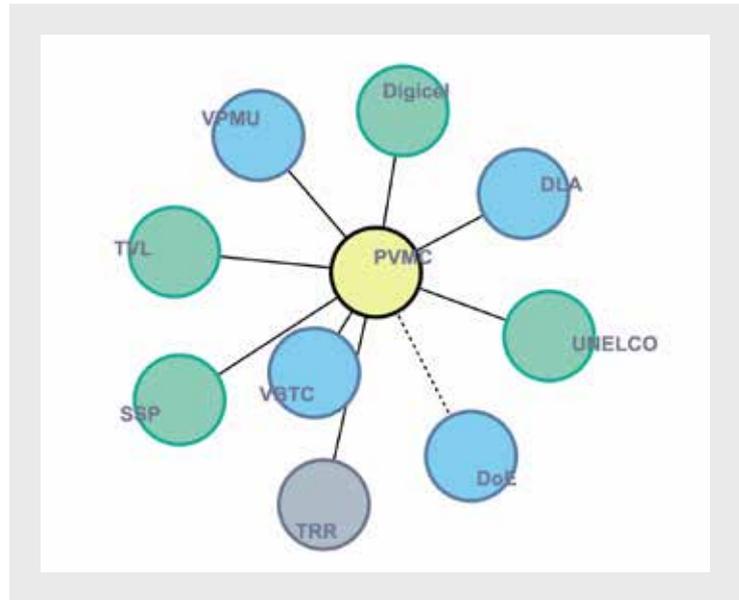


Figure 5: Map of the Actors Involved in the *Basic Infrastructure Element*. Source: CRPT (2019).

Mobility (MOB)

Summary by Urban Element - Mobility

Participation of the Local Government and entities

Under the Municipalities Act, responsibility for road maintenance within the jurisdiction of the Port Vila Municipality rests with the Municipality. However road conditions had deteriorated to the extent that that government placed the responsibility for road maintenance in Port Vila with the Public Works Department of the Ministry of Infrastructure and Public Utilities. This arrangement has now been formalised in the new Public Roads Act which is now in the process of being implemented.

- Department of Public Works
- Traffic Wardens
- Ifira Wharf
- South Sea Shipping
- Airports Vanuatu Limited (AVL)
- Ministry of Infrastructure and Public Utilities (MIPU)
- Ministry of Transport
- Vanuatu Project Management Unit (VPM)

There is no publicly owned transport in Port Vila. Transport services are supplied by a fleet of privately-owned minibuses and taxis. Transport management is a challenge in Port Vila with a generally recognised oversupply of buses and taxis with minor traffic jams occurring at peak times and at certain locations around the city.

Participation of stakeholders and their influence on the element

The major development partners in the infrastructure sector are the Asian Development Bank (ADB), Australian Agency for International Development (AusAID), European Union, Japan International Cooperation Agency (JICA), Millennium Challenge Corporation, New Zealand Aid Programme, and the World Bank.

With regards to the local planning in the consolidated urban area, the Municipality and national government share the maintenance of roads.

- Ministry of Infrastructure and Public Utilities oversee the maritime and airports transport sector.

What is needed from the stakeholders in the city

- Uncoordinated efforts are leading to poor planning
- Partnerships with donors

Main relation of the stakeholders with other Urban Elements

Mobility connects most directly to the *Built Environment* and *Supply Chain & Logistics* elements, but additional relates to *Economy* and *Basic Infrastructure*.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- - - - Legally Engages
- Communicates
- No Legal Engagement

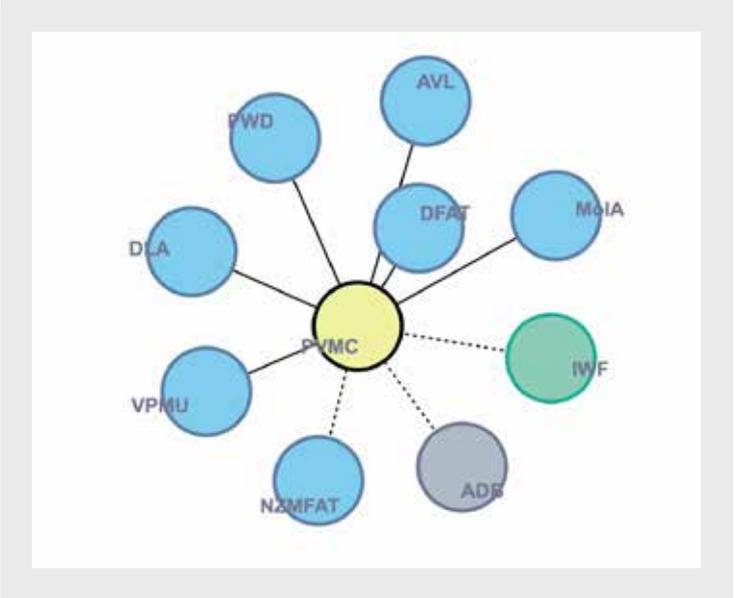


Figure 6: Map of the Actors Involved in the *Mobility Element*. Source: CRPT (2019).

Municipal Public Services (MPS)

Summary by Urban Element - Municipal Public Services (MPS)

Participation of the Local Government and entities

The Local Government participates in some of the different components with different levels of role and / or function:

- Cemeteries
- Civil Registration
- Food Inspection
- Municipal Taxes

Participation of stakeholders and their influence on the element

This *element* has a wide variety of stakeholders involved in each of the components, therefore, only some essential actors are cited.

In the management of cemeteries the Department of Public Works is the main entity. Civil Registry and Justice Services (law enforcement) have broad powers and responsibilities at the national level. The only instance at the Local Government level is the Civil Registry.

In the component of heritage protection and cultural activities, responsibilities are shared between Local Government, national and private authorities, and in almost no case they have the necessary resources to ensure the necessary improvements in the expansion of interventions and value the heritage.

The National Government is responsible for the coordination of emergency and rescue services .

Food inspection and monitoring services is shared between the Local Government and National Government; actors perform several roles depending on their capabilities and resources.

In the component of public lighting, the private company UNELCO oversee this responsibility.

What is needed from the stakeholders in the city

Due to the quantity and diversity of components and the fact that in each case the key stakeholders are different, and have specific roles and competencies, each interested party is expected to ensure timely interventions in the city. However, heads of departments within the Local Government must be more included in information exchange.

In the case of civil protection, more inclusive coordination and dialog is required from the National Government to the Local Government

Main relation of the stakeholders with other Urban Elements

This *element* relates most directly to the Economy and Basic Infrastructure elements, with specific ties to municipal finance and physical infrastructure that enables the provision of basic services (e.g. public lighting).

- ○ Public Entity
- ○ Private Entity
- ○ Civil Society Organization
- ○ Other Major Institution
- Local Government

- Formal Partnership
- - - - Legally Engages
- · · · · Communicates
- · · · · No Legal Engagement

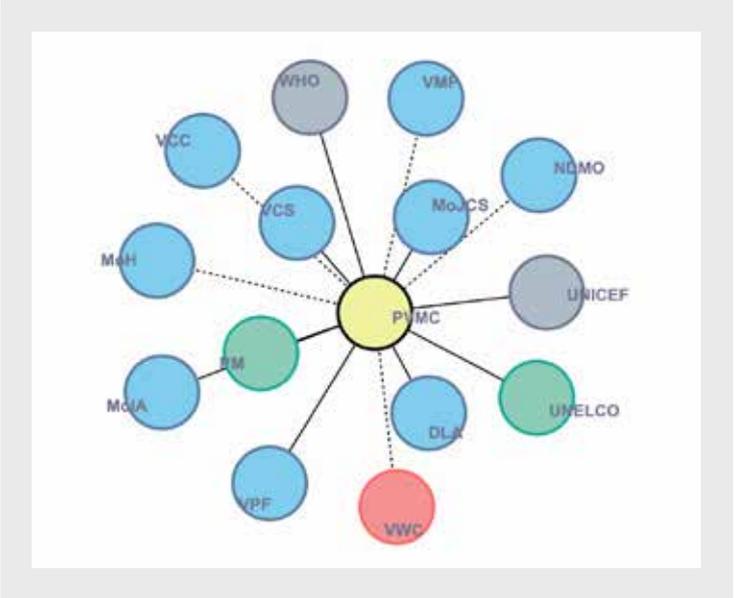


Figure 7: Map of the Actors Involved in the *Municipal Public Services Element*.
Source: CRPT (2019).

Social Inclusion and Protection (SIP)

Summary by Urban Element - Social Inclusion and Protection

Participation of the Local Government and entities	The Government is the main service provider of health services. There is a small private sector that contributes to health care, services in the Port Vila. Some health programmes are primarily delivered by the Government with support from development partners, NGOs, faith-based organizations and a small private sector.
Participation of stakeholders and their influence on the element	<p>This <i>element</i> comprises of components with responsibility and resources at the national level. In education (Ministry of Education), assistance and Social Protection (Ministry of Justice), and health (Ministry of Health) with limited to no participation from the Local Government.</p> <p>Since this element comprises many other components such as education, social care and protection, food security and health, it is quite challenging to understand in a consolidated approach how the stakeholders influence the local government in each of these sectors.</p>
What is needed from the stakeholders in the city	<p>In this <i>Urban Element</i>, the National Government has great influence and decision-making power, the city is then subject to state policies. In this case, the Ministry of Education has achieved high levels of coverage. However, quality is pending improvement. While access to universal health services is non-existent and health services are limited.</p> <p>Non-governmental organizations clearly play a critical role in Vanuatu, filling gaps in the social safety net. A large number of donor programs work in these areas as well, either directly or indirectly by funding NGOs. Most of these NGOs are members of an umbrella organization, VANGO (Vanuatu Association of Non-Government Organizations).</p>
Main relation of the stakeholders with other Urban Elements	This <i>element</i> is one of the pillars to ensure the improvement of the basic conditions of the inhabitants based on coverage and accessibility of services. Its link to other elements is broad, for example, with the Urban Environment by participation mechanisms; with Basic Infrastructure to improve health conditions; with Municipal Public Services, because it is the inhabitants who must have more and better processes to develop their potential.

- ○ Public Entity
- ○ Private Entity
- ○ Civil Society Organization
- ○ Other Major Institution
- Local Government

- Formal Partnership
- - - - Legally Engages
- · · · · Communicates
- · · · · No Legal Engagement

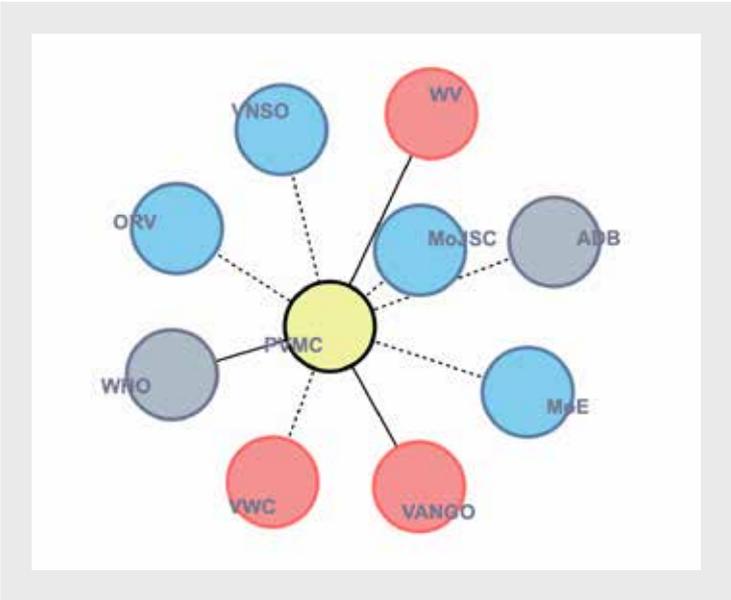


Figure 8: Map of the Actors Involved in the Social Inclusion and Protection Element. Source: CRPT (2019).

Economy (ECO)

Summary by Urban Element – Economy

Participation of the Local Government and entities

The main institutions controlling monetary and economic policy are the Reserve Bank of Vanuatu and Ministry of Finance and Economic Management respectively.

The Vanuatu Chamber of Commerce and Industry (VCCI) is largely funded through government business licenses and is particularly active in promoting the commercial sector and has several sectoral groups as part of its set up.

Participation of stakeholders and their influence on the element

The Vanuatu Chamber of Commerce and Industry private sector, NGOs, central government have little to do in influencing council decisions or priorities. In particular businesses and private sector rate payers have virtually no say in the operational activities of the council or the services it provides.

What is needed from the stakeholders in the city

- The challenge for the municipal councils and the central government is to create a better socioeconomic and political climate that will allow the private sector to grow in the future especially in under-represented sectors such as manufacturing.
- The informal sector plays an important role in Vanuatu's urban economy by providing jobs, especially for those who cannot find formal employment – either due to a lack of formal education or an undersupply of jobs. Informal job opportunities include those in: handicrafts; 'wasem maot' stalls; urban gardening; construction; domestic help and food-selling – whether along streets, at markets or directly to offices in the urban areas.
- The government has the opportunity to drive the urban development process by putting adequate legislation and plans in place as which should improve urban amenity and economic development opportunities, improve conditions for economic growth, enhance Equal participation in economic development and growth, prepare City Development Strategies to build up the economic capacity of urban areas.
- Invest financial and human resources into the ward development committees to help move decision-making from a top-down approach to a participatory one which engages all stakeholders, including the urban poor.

Main relation of the stakeholders with other Urban Elements

This *element* must be related and considered in each activity, project and/or program to identify and prioritize resource allocation. This *element* should also allow us to link initiatives to the impact on the urban economy, incorporate impacts/criteria on poverty, education, employment generation, diversification of resources and the identification of new financial mechanisms.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- Legally Engages
- Communicates
- No Legal Engagement

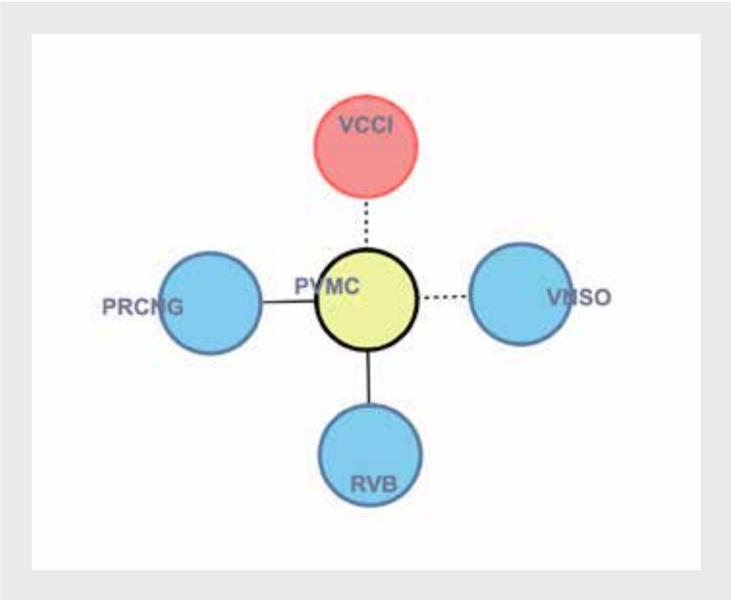


Figure 9: Map of the Actors Involved in the Economy Element. Source: CRPT (2019).

Ecology (ECO)

Summary by Urban Element - Ecology

Participation of the Local Government and entities

The Department of Environmental Protection and Conservation are the most active and important body that support the Local Government. This actor has the skills and an installed technical-capacity; however, its resources are not sufficient to meet a multiplicity of responsibilities.

Participation of stakeholders and their influence on the element

Under the current system, environmental considerations are marginalized in the decision-making process. One of the reasons is a lack of participation by most stakeholders. While the coordination between ministries regarding economic development is relatively good, the coordination between ministries involved with the environment is well below standard. Horizontal coordination between the technical staff has mostly been carried out on an informal level.

What is needed from the stakeholders in the city

PVMC lacks a central point of contact on environmental issues. The current actors within this element have strengths in institutional and social capital, particularly with regard to community leadership, and the strong government agency, NGO, and community-level networks that are in place.

Main relation of the stakeholders with other Urban Elements

Ecology stakeholders should be closely related to the urban planning process and the design of programmes and projects in several of the *Urban Elements*.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- Legally Engages
- Communicates
- No Legal Engagement

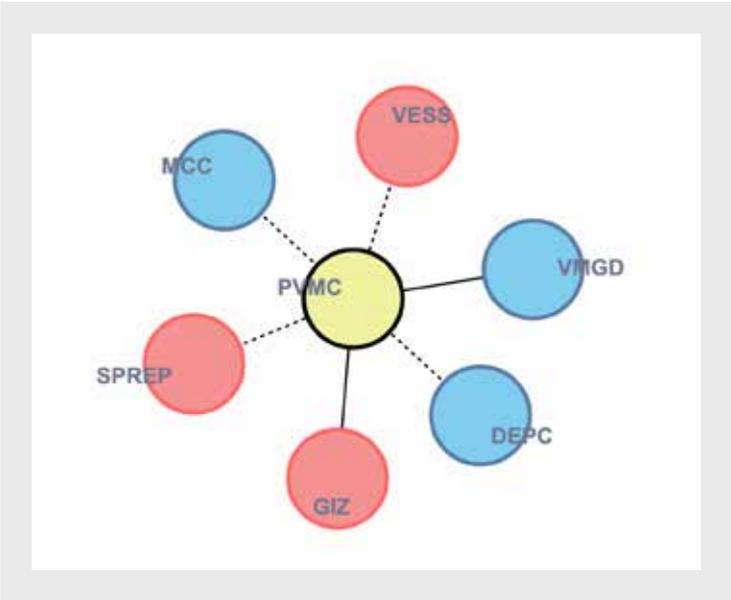


Figure 10: Map of the Actors Involved in the Ecology Element. Source: CRPT (2019).

Risk-Related Stakeholders

Priority shocks to which the city is exposed have been presented (See **Annex IV. Shocks Analysis**). In that classification it was established that three of them are related to the group of risks considered natural (tropical cyclone, tsunami, and flood) and one that relates to complex systemic shocks (financial crisis) (See **Appendix 4. List of Shocks, Stresses, and Stressors**). Relevant actors will be presented mentioning - when possible - the related types of risk will also be linked to the *Risk Reduction Measures (RRM)*.

Ministry of Climate Change Adaptation, Meteorology, Geo-hazards, Energy, Environment and Disaster Management drives the whole-of-government strategic agenda for Climate Change and Disaster Risk Reduction. Within the Ministry, the National Disaster Management Office recommends when to declare a state of emergency, coordinates with other ministries and non-governmental organizations, and advises on the need for assistance to manage disaster response.

Figure 11 below shows the structure employed in Vanuatu in situations of emergency response.

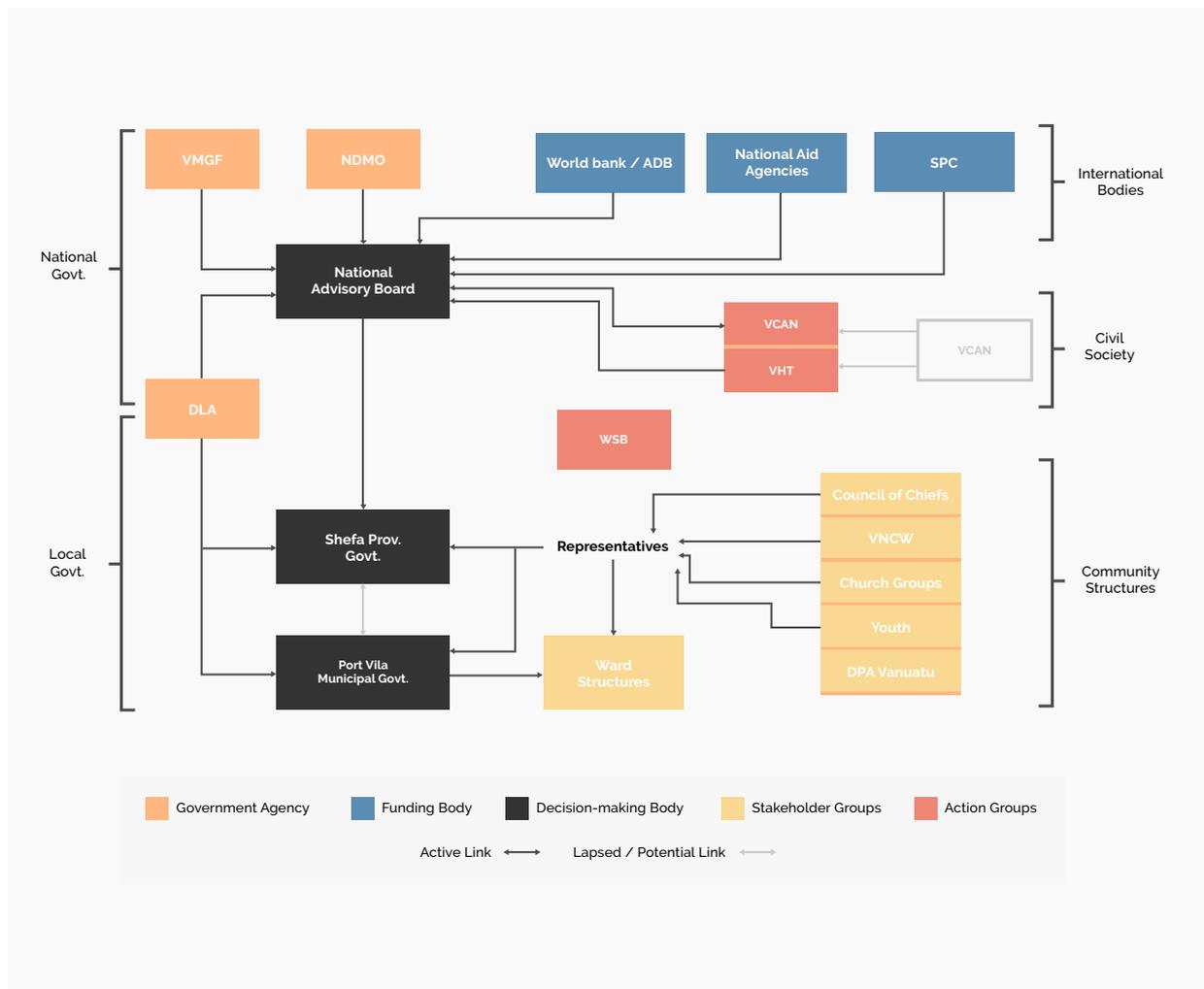


Figure 11: Vanuatu Emergency Response Structure.

National Actors Linked to Risk Reduction

National Disaster Management Office (NDMO)

- The NDMO develops national plans and procedures, including the National Emergency Operation Centre Standard Operating Procedures (SOPs) and the Tsunami Response Plan.
- To oversee and ensure the effective and efficient coordination of the Disaster Risk Reduction and Disaster Management
- Coordinate activities of disaster monitoring, warning and immediate post disaster response including disaster relief work at national and provincial level;
- To oversee and ensure the effective and efficient coordination of the Disaster Risk Reduction and Disaster Management

National Disaster Committee (NDC)

- The NDC makes recommendations to the Council of Ministers (COM) on the declaration of the State of Emergency, which subsequently provides to advice the Head of State for declaration. Be activated when a specific threat of disaster develops or when a disaster occurs;
- The NDC will also make recommendations to the COM under the Public Finance and Economic Management Act for release of funding to respond to the needs of the affected people.
- Control and direct the allocation of aid provided by government, bi-lateral, multilateral and non-government agencies;
- Coordinate requests for assistance;

Vanuatu Meteorology and Geo-Hazards Department (VMGD)

- Risk monitoring is principally conducted by VMGD
- VMGD undertake meteorological forecasting, seismic and volcanic monitoring.
- It is the entity that has the capacity installed to provide a forecast report and bulletins and weather reports. In this case, the evaluation of RRM is formed from the Early Warning System (EWS) and is implemented with coordinating institutionalized authorities.
- The VMGD works with the NDMO on risk mapping and management.

National Advisory Board (NAB)

- The NAB acts as Vanuatu's supreme policy making and advisory body for all Disaster Risk Reduction and Climate Change (CC) programs, projects, initiatives and activities;
- Ensures the development of appropriate Vanuatu DRR and CC priorities, policies, guidelines, positions and stances;
- Advise, facilitate and endorse the development of new DRR and CC programs, projects, initiatives and activities; including but not limited to related reviews, restructuring, mainstreaming and policy development

Ministry of Health (MoH)

- Disease surveillance and vector control of communicable diseases

Local Actors Linked to Risk Reduction

Local entities specifically linked to tropical cyclone

PVMC has endorsed the Mainstreaming Disaster Risk Reduction programme that has a key objective for risk information and reduction measures integrated in urban planning and land use policies.

When the city faces the impacts of natural hazards, depending on the shock different elements of the city can be impacted and the conditions of vulnerability of the inhabitants are expanded. In this sense, actors related to emergency response are activated:

A second but additional core strength is the work of NGOs which provide a range of preventative roles such as educating residents about climate-related hazards and improving infrastructure within exposed communities (particularly through WASH-related initiatives).

Entities:

- VCR - Vanuatu Red Cross
- VANGO Building Society (NGO)

Civil Society Organisations (CSOs) play key roles in climate change and disaster risk reduction efforts in Vanuatu. International CSOs have developed networks such as the Vanuatu Climate Action Network and Vanuatu Humanitarian Team networks, while local CSOs join in the Vanuatu Association of Non-governmental Organisations network, incorporating councils of churches, chiefs, women and youth.

Key Stakeholders for the City

In *Urban Elements* and risks, the analysis of the relationships between the actors involved have covered almost the entire scenario however, other relevant actors can be identified that must be exposed to complete the reading of the city from a holistic perspective.

Vanuatu Red Cross

- Vanuatu Red Cross plays a unique role in partnering with government on humanitarian efforts in disaster preparedness, response and recovery.

Donors and Development Partners

- Donors and development partners are essential partners with government and other stakeholders in climate change and disaster risk reduction in Vanuatu, and include international governments (that donate funds), and global and regional organisations (including various agencies of the United Nations). They provide substantial resources to supplement Vanuatu's own resources.

Private Sector

- The private sector plays a vital role in the development of Vanuatu. Public-private partnerships have been entered into and implemented across a range of sectors.
- Products and services supplied by the private sector assist the government in addressing challenges in communications with communities and individuals across the country, including remote areas, in times of disaster.

Key Findings

- The Local Government and the National Government are highly connected, despite the existence of decentralisation policies, which consider local governments (municipalities) as autonomous bodies. For instance, a portion of the PVMC budget (20%) comes from the contribution of the National Government.
- The governance structure for Greater Port Vila is complex, crossing two local government jurisdictions, with large areas of informal settlements, customary land-ownership arrangements, and a number of NGO organisations engaged in municipal service provision in different areas across the city.
- While many of the stakeholders evaluated are directly linked to the Municipality, the lack of an effective coordination among stakeholders acting at the local level has been identified as a main source of disruptions for sustainable management of funds allocated to implement several initiatives as well as redundancy of interventions and roles. There is a significant need for strengthened coordination among the stakeholders and reinforcement of communication.
- At the national level, a primary concern is around the lack of institutional, legal and financial frameworks to address urban affairs in general. In fact, there is not even a nationally accepted definition of "urban" in the context of a historic focus on rural development. This has meant there is very limited data on the urban context.
- There is an urgent need to coordinate the different stakeholders to ensure urban expansions are planned for and managed sustainably. The PVMC has made advances in their level of civic engagement but limited internal revenue and financial assistance from the central government hinder the effective delivery of services at the local level.
- There are limited financial and technical capacities at the local level for strategic infrastructure projects conducive to preventing and mitigating disaster risks.

Find out more about the **City Resilience Profiling Programme**
and **UN-Habitat's partnerships** with other cities at:

www.unhabitat.org/urbanresilience

info@cityresilience.org

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Recommendations of Actions for Resilience and Sustainability

PORT VILA

This report details the findings, analysis, diagnosis, and commitment building, as well as the Recommendations of Actions for Resilience and Sustainability for the city of **Port Vila**.