

OCEAN CITIES OF THE PACIFIC ISLANDS

POLICY BRIEF #3 RE-NATURING URBANIZATION

INTRODUCTION

Addressing environmental challenges and integrating Nature-based Solutions (NbS) in coastal settlements can provide social and economic benefits as well as strengthen resilience in Pacific islands. In Ocean Cities at the nexus of ocean health, climate change, and urban development, large infrastructure and service delivery gaps are holding back sustainable growth, causing environmental degradation and inequality in the region. These issues must be addressed for cities to grow in an equitable and environmentally responsible manner in small island developing States. Ocean Cities of the Pacific face many interconnected challenges and threats: increased pressure on natural resources through unchecked urbanization, inadequate environmental planning capacities, lack of inclusiveness in policy planning and the ongoing destruction of coastal and marine ecosystems through unsustainable land use and coastal development, overfishing, pollution, and climate change-induced natural disasters.

In Fiji alone, annual losses due to extreme weather events could reach 6.5 percent of the country's gross domestic product by 2050. Challenges have been exacerbated by land tenure issues and lack of land resources, placing additional pressure on limited natural resources in rapidly growing Ocean Cities of the region. At the same time, there are existing opportunities to meet challenges in Ocean Cities using NbS that are ocean friendly, climate resilient and can achieve multiple benefits.

This third of three policy briefs focused on Ocean Cities focuses on NbS for increasing the resilience of Ocean Cities of the Pacific islands. This policy brief is premised on the recognition of the deeper links between Ocean Cities and ecosystems - both landscapes and seascapes- to guide future policy in integrated, climate resilient sustainable urban planning in the Pacific island region. It is also designed to promote the social and economic benefits of NbS as a means of engaging urban communities and private sector stakeholders in solutions for sustainable coastal development and resilience.

KEY MESSAGES

BENEFITS OF IMPLEMENTING NBS IN OCEAN CITIES

- Provides not only cost effective environmental, social and economic benefits, but also incentives for multi-stakeholder action.
- Supports urban communities in accessing natural resources to support livelihoods, with co-benefits including building urban resilience through ecosystem-based adaptation and enhancing climate change mitigation.
- Revitalizes cultural connections to the ocean - that are weakening in cities in the process of urbanization - while building on this shared identity and narrative to raise awareness, educate youth and engage urban communities.

EXAMPLES OF NBS IN OCEAN CITIES



Rehabilitating mangroves to protect coastlines and biodiversity of islands



Combining natural and engineered infrastructure for water management



Urban agroforestry to address challenges of land tenure, health, food security, and unemployment



Establishing Educational Managed Marine Areas to encourage ownership by young people



Constructing wetlands and restoring forest landscapes to support these ecosystems and conserve the services they provide

- **Integration of valuation of ecosystem services**
- **Better data and research**
- **Application of NbS**
- **Engagement through traditional solutions and a 'Pacific Way'**



COST-EFFECTIVE URBAN RESILIENCE THAT BALANCES THE BUILT ENVIRONMENT AND NATURE

TO BE SUCCESSFUL, NBS MUST BE ADAPTED TO LOCAL CONDITIONS AND TO THE UNIQUE REQUIREMENTS OF OCEAN CITIES.

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OCEAN CITIES OF THE PACIFIC SHOULD LEVERAGE EXISTING POLICIES AND FRAMEWORKS WHEN DEVELOPING AN APPROACH TO OCEAN-FOCUSED, CLIMATE-RESILIENT SUSTAINABLE DEVELOPMENT, FEATURING NBS.

KEY ISSUES

Ocean Cities face a multitude of complex challenges for sustainable development linked to their size, rapidly growing populations, geographic isolation, deep interconnectedness with marine and coastal ecosystems, and dependence on precious natural resources in a changing climate. Ocean Cities in the Pacific in particular are at great risk of climate change-induced natural hazards, with disaster risks fast outpacing resilience and with coastal cities struggling to cope with extreme flooding caused by storms, tropical cyclones and rising tides. Holistic, transformational change is needed to protect and manage the natural and built environments of expanding Ocean Cities within the region. As climate change accelerates, sea levels rise, and extreme weather events combined with population growth stretch Pacific coastal cities beyond their coping capacity.

Nature-based Solutions (NbS) are defined as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”.¹ They are actions inspired by, supported by, or copied from nature.

The nexus of ocean, climate change, and urban development challenges in small island developing States of the Pacific calls for an integrated island-appropriate approach based on enhanced data and research. Living solutions inspired and supported by the use of natural processes and structures, designed to meet multiple social, economic and environmental needs, are often most appropriate. Working in harmony with nature can be achieved through nature-based urban planning, robust and environmentally friendly building designs, and emphasizing the value of local materials, food, and ecosystem services. An Ocean Cities approach engages the people of Pacific islands and integrates a ‘Pacific Way’ to building solutions. A systems approach is needed in Ocean Cities, at multiple scales, to enable analysis of trade-offs and support decisions that deliver multiple benefits – to society, economy and environment.

KEY OPPORTUNITIES FOR ACTION

Those living in Ocean Cities of the Pacific islands today have an opportunity to honour their traditional heritage of ocean stewardship and establish a new paradigm of sustainability for Ocean Cities worldwide. The integration of NbS into urban planning can provide not only cost effective environmental, social and economic benefits, but also incentives for multi-stakeholder action. NbS have the power to enable urban communities to access natural resources and to support livelihoods, with co-benefits including building resilience through ecosystem-based approaches and enhancing climate mitigation. Furthermore, they provide an opportunity to revitalize cultural connections to the ocean – connections which are weakening in the current processes of urbanization - and to raise awareness, educate youth and engage communities.

Already there exist several policies and international frameworks that recognize the need for an inclusive and integrated approach to urban planning in cities. Article 7 of the Paris Agreement ensures the integrity of all ecosystems and the role of adaptation in protecting livelihoods and ecosystems.² Likewise, the Framework for Resilient Development in the Pacific aims to enhance resilience of Pacific islands to climate change and natural disaster by considering key factors such as population growth, urbanization, poorly planned coastal development, and degradation of ecosystems.³ Moving forward, Pacific island countries can leverage existing frameworks when developing a climate-focused urban agenda for Ocean Cities.

BUILD AWARENESS WITHIN EDUCATIONAL AND COMMUNITY GROUPS

- Highlight NbS in curriculums of primary, secondary and tertiary educational systems, as well as in informal education systems. This is key to building the awareness of current and future leaders about the value of integrating NbS into urban planning and infrastructure.
- Conduct research on the value of ecosystem services and identify potential costs, benefits, and incentives for civil society, community actors and private sector stakeholders that can drive change, build partnerships and ownership. Best practices, including traditional knowledge of NbS, should be documented to inform policy making and shared beyond Ocean Cities of the Pacific.



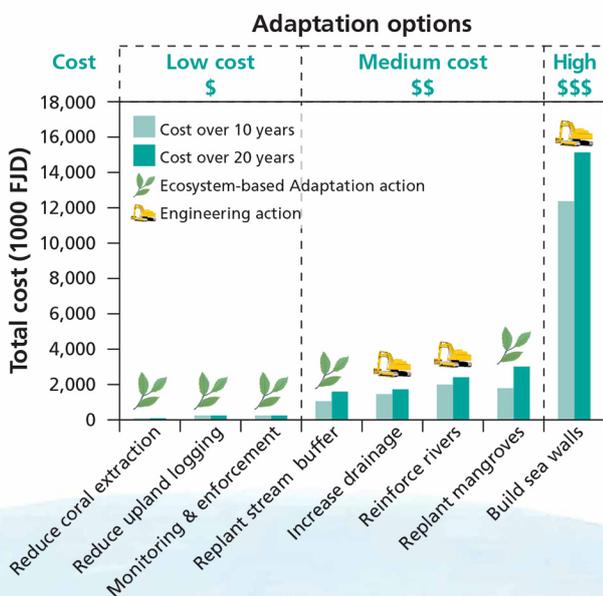
Building resilience through natural infrastructure solutions

In Fiji, natural hazards and climate change represent major obstacles to development, to the point where by 2050, Fiji's annual losses due to extreme weather events could reach 6.5 per cent of GDP.⁴ In 2016 tropical cyclone Winston caused damages amounting to 20 per cent of GDP and the economic impact of natural disasters is only likely to increase into the future, driven by increasing urbanization and climate change. Simultaneously, Fiji will feel other effects of climate change significantly, namely sea-level rise and ocean acidification.

A climate vulnerability study prepared by the World Bank in partnership with the Global Facility for Disaster Reduction and Recovery estimates that FJ\$9.3 billion (US\$4.5 billion) over ten years is required to build Fiji's resilience and capacity to adapt to climate change,⁵ with measures including building more inclusive and resilient towns and cities; improving infrastructure services; developing climate smart agriculture and fisheries; and building socioeconomic resilience.

At the same time, employing NbS such as conserving riparian and coastal ecosystems could provide flood protection and similar benefits at relatively low cost.⁶ Restoration of ecosystems through "willingness to pay" by the public and public-private partnerships are financing solutions worth exploring.^{7, 8} For example NbS adopted in Lami, a suburb of the greater Suva area, provide less expensive development and conservation options than engineering options, creating the added benefit of avoided damages.

Total cost to implement ecosystem-based and engineering adaptation options in Lami Town, ranked for a 10-year and 20-year period, at a 3 per cent discount rate.⁹



The least-cost alternatives for storm protection include reducing coral extraction, reducing upland logging, and monitoring and enforcement, while the most expensive option is to build sea walls. The medium cost options include replanting stream buffers, increasing drainage, reinforcing rivers, and replanting mangroves. In addition to life-cycle costs of adaptation options, benefit-cost calculations should integrate estimated benefits of avoided damages or ecosystem services.



Educational Managed Marine Areas (EMMAs) in French Polynesia¹⁰

EMMAs are coastal areas managed in an ongoing participatory manner by local school groups. Supported by scientists, local organizations and government authorities, school students manage their EMMA through learning, suggesting and applying management practices and rules, such as fishing regulations or mooring bans in certain areas. Today, 120 children across six Marquesan islands are the honorary custodians of an EMMA, in Vaitahu, Hanau, Hakahetau, Hanaiapa, Anaho and Hane bays.

ENHANCE COMMUNITY PARTNERSHIPS TO ENCOURAGE OWNERSHIP OF NBS

- Develop partnerships between government, civil society and communities by establishing forums at the district and provincial levels to discuss urban planning issues. This could provide a much-needed space to discuss environmental issues and share experiences and good practices in NbS, ultimately facilitating the development of local solutions to local problems.
- Encourage local communities to work together with government and other relevant stakeholders to produce guidelines for community-based ecosystem approaches.
- Encourage the local management of ecosystems, such as the more than 400 locally managed marine protected areas in Fiji. This offers opportunities to protect against environmental degradation and biodiversity loss while enhancing climate change resilience and ownership.¹¹

PRIORITIZE GREEN PUBLIC SPACES IN COASTAL SETTLEMENTS

- Create or restore green spaces and natural habitats along city coastlines and in urban environments to provide flood protection and prevent coastal erosion, create recreational opportunities, support social cohesion, enhance economic opportunities and provide multiple ecosystem service benefits for the whole community.¹² Increasing green spaces and conserving coastal ecosystems in cities can ameliorate temperature and reduce urban heat island impacts.
- Ensure urban parks provide economic opportunities for all social groups, such as spaces for women and youth to sell handicrafts and other products, and to play sports.
- Encourage urban schools to utilize these natural laboratories for environmental education on ecosystems and biodiversity, and to provide an opportunity for students to reconnect with their natural environment and the ocean.
- Promote urban food and water security through spaces for agroforestry, wetland restoration, and river rehabilitation in peri-urban and urban coastal areas, to boost fish populations and reduce flooding risks, while providing recreational benefits.

Freshwota Park in Port Vila is a recreational urban park maintained by the local community as custodians of the Matnakara Water Protection Zone,¹³ and My Suva Park in Fiji demonstrates how green spaces can be integrated into urban landscapes.¹⁴

TRANSITION TOWARDS A NATURE-BASED CITY CONCEPT

- Rehabilitate wetlands and forest landscapes in habitats with conducive environmental conditions. These ecosystems can enhance water retention, improve water quality, and reduce risks associated with disasters and climate change.
- Invest in comprehensive studies evaluating options to guide the use of NbS and hybrid solutions for urban planning and infrastructure development.¹⁵ Some solutions may be self-evident, but a precautionary approach to climate-resilient urban planning solutions should be utilized.
- Wherever possible, ensure buildings are environmentally friendly, energy efficient¹⁶, and take advantage of passive solar design,¹⁷ keeping in mind that green infrastructure will require advanced engineering and revised building codes that respect the natural environment.
- Enhance city planning and zoning, including along coasts and waterways, to foster residents' ability to walk, cycle or use clean public transport wherever possible. This is integral to minimizing air pollution and enabling low-carbon development¹⁸ in Ocean Cities.
- Incorporate green infrastructure projects for renewable energy and waste management to consume fewer resources, produce less waste, and improve natural resource management.¹⁹
- Extend urban planning from reefs to the ridges to improve continuity and effectiveness of management efforts while addressing issues of deforestation, landslides and sediment loads that carry consequences for downstream urban centres.
- Treat wastewater closer to residential sources using NbS. For example, buildings with microalgae on their exterior can treat wastewater and simultaneously provide other ecosystem services, or wetlands could be constructed for wastewater treatment.
- Develop an integrated approach to waste management that ensures effective seepage management, prevents leakage into the ocean and enables reuse of water as a precious resource in the urban context.

APPLY INTEGRATED COASTAL ZONE MANAGEMENT USING NBS

- Restore coastal ecosystems to help urban coastal communities withstand sea-level rise, improve water quality, and strengthen natural carbon sinks. Integrating NbS into coastal resilience measures, such as the restoration of mangroves, are highly cost effective compared to conventional engineering options or 'grey' infrastructure such as sea walls while providing additional ecosystem services. Understanding coastal processes and interplay of ecosystems to inform coastal development planning is imperative to avoid negative consequences.²¹
- Stabilize eroding shores and banks of waterways with native vegetation to provide essential ecosystem-based services: protect coastlines, decrease run-off, protect against eutrophication, decreasing flooding, and increase urban resilience.

LEADING PRACTICES IN WASTE MANAGEMENT IN THE PACIFIC ISLANDS

In the face of limited land and myriad challenges, Ocean Cities in Pacific islands are working towards more sustainable waste management.

- i. **Fiji:** The climate-proofed landfill in Labasa provides good practices in disaster waste management,²⁰ green waste collection and composting;
- ii. **Kiribati:** Introduction of successful community driven waste segregation practices in recycling initiatives;
- iii. **Papua New Guinea:** Initiatives such as the “Go Green” programme educate people to be responsible for their own waste and dispose of waste properly;
- iv. **Samoa:** Promotion of recycling, reuse and composting and plans to reduce single-use plastics;
- v. **Vanuatu:** Initiatives to ban single-use plastics such as straws.

IMPROVE POLICY MAKING STRUCTURES FOR OCEAN-FRIENDLY CITIES



Mangrove restoration as a NbS for integrated coastal management

Mangroves, seagrass beds, and coral reefs have effectively contributed to protection against waves and limiting coastal erosion in areas of greater human and hotel density along the coast in Vanuatu.²² Papua New Guinea has led the way in the establishment of mangrove policies, through its sustainable management of mangroves in Manus and West New Britain provinces.²³ In Funafuti in Tuvalu, vetiver grass is being used to absorb nutrients from wastewater (sourced from household, animal wastes and rubbish dumping sites) before it enters the lagoon. As well as absorbing excess nutrients that otherwise encourage invasive seaweed blooms, compromising lagoon and coastal health, vetiver grass provides the added benefit of reducing erosion along the coast of the lagoon.

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