Beyond the roadmap: approaching environmental sustainability challenges in pacific island ports

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Summary
Given the critical role ports play in economic growth and development in Pacific Island Countries (PICs) it is essential that sustainable development principles drive future growth. The environmental sustainability of PIC ports was assessed against a framework of indicators demonstrating that PIC ports generally performed well below global best practice, even in ports of similar scale. Beyond specific actions identified in a Green Ports Roadmap for the Pacific, this paper explores regional key themes, challenges, priority actions and holistic approaches toward environmental sustainability in PIC ports.

Keywords: environment, sustainability, ports, pacific islands

Introduction

Ports in Pacific Island Countries (PICs) are facing a suite of environmental, economic, and social stressors [1]. PICs are demanding global action on decarbonisation and climate change [2] and despite their small contribution to global greenhouse gas emissions, are leading by example. The PICs of Kiribati, the Marshall Islands and the Solomon Islands for example have submitted a request to the International Maritime Organisation to commit to net zero shipping emissions by 2050 [3]. PIC ports play a critical role in economic growth and development. It is essential that sustainable development principles are embedded in future growth, enabling adaptability of port infrastructure and operations to accommodate changes associated with the requirements and expectations of both shipping services and the communities' each port supports.

A Roadmap for Green Ports (the Roadmap) in the Pacific was developed, outlining short-, medium-, and long-term actions for individual ports, operators within ports, governments, donor agencies and other stakeholders to enhance port environmental sustainability. The Roadmap was compiled after an initial assessment of environmental sustainability across 15 PIC ports and benchmarking of these ports against peer ports internationally and a review of global best practice.

Beyond the specific outcomes and actions of the Roadmap for each of the 12 indicators, a number of key themes for a holistic approach to sustainability were identified and are captured in this paper.

Environmental Sustainability Framework

Assessment and benchmarking of the environmental sustainability of the PIC ports was undertaken based on a tool adapted to reflect the context in PICs. A comprehensive desktop review that included specific consideration of the World Ports Sustainability Program (WPSP) [4] informed the tool adaptation and culminated in criteria across 12 indicators calibrated to account for the size, scale and function of the PIC ports.

Indicators (outlined in Table 1) were developed to include measurement statements (and associated point values), associated questions and suggested evidence to inform and standardise assessment.

Table 1 Environmental sustainability indicators included in the assessment tool

Indicator	Intent
Greenhouse gas (GHG) emissions	Define GHG emission sources and contribute toward related targets through reduction in carbon footprint.
Energy use/ efficiency	Define and improve energy efficiency and conservation.
Climate change resilience	Anticipate, prepare for, and respond to hazardous events, trends, or disturbances.
Air pollutants	Limit the harmful effects of air pollutants, including ships at berth.
Noise pollution	Limit the harmful effects of noise pollution on land and water environments.
Light pollution	Minimise glare, light trespass, sky glow and impacts on nocturnal environments.
Liquid waste	Limit water quality impacts of oil pollution, ballast water and wastewater.
Solid waste	Manage solid waste streams, to prioritise diversion from landfill by recycling or reuse
Biodiversity	Conserve and restore habitats to promote biodiversity in port and adjacent environments.

Environmental sustainability assessment

The outcome of the assessment and benchmarking was not unexpected, given the known socio-economic and funding constraints across the Pacific, with PIC ports generally performing below global best practice across all indicators. This was also observed even when the ports were benchmarked against international ports of similar

size and scale. It was also observed that the environmental sustainability performance improved with increased port size . This was however not the case for performance against climate risk and adaptation, where success was influenced by the relevant ports' vulnerability to climate hazards and access to donor funding.

Noise, light, waste, and biodiversity measures scored poorly across all PIC ports which was anticipated due to the relative size of operations, isolated location, age of infrastructure and limited available funding streams.

Roadmap actions by indicator
Specific actions were identified against each indicator including core practices and stretch practices for improved performance in accordance with the environmental sustainability framework. Monitoring and reassessment are expected to be key steps in achieving improved environmental sustainability across PIC ports. In addition to indicator specific actions, trends for priority action emerged from the assessment and Roadmap.

Priorities for action
Energy use and efficiency, and climate change risk and adaptation were the two indicators that ports were most engaged with through the assessment. This active engagement was due to motivation to reduce operational costs, awareness of the benefits of renewable energy technologies and experience with damage recovery due to climate related natural hazard events. These two indicators carry direct financial risk for the ports given the threat of climate change and dependency on diesel fuel. Renewable energy infrastructure was identified as a priority investment area for local and national governments.

Similarly, waste infrastructure was also identified as a priority investment area for governments, however ports were less engaged in assessment against the solid waste indicator as they generally rely on waste management services beyond the port boundary and expressed limited influence on improvement.

While quantification and/ or monitoring was generally being undertaken for some indicators, baselines for air pollution, noise pollution, light pollution, biodiversity and liquid waste were generally not present. Therefore, establishing these with future monitoring and evaluation was identified as a priority for ports.

Key Challenges
Many of the challenges faced by PIC ports were common and often were unique to the region due to location and scale. A range of key challenges were identified in the Roadmap that were largely linked back to the limited capacity (skills, roles and governance) at each port, which was ultimately linked to the scale of ports and the PICs themselves. The availability of resources and equipment to undertake assessment, monitoring or act to improve environmental sustainability performance, as well as supporting legislation and the ability to comply with existing legislation, were noted challenges across most ports.

Approaching solutions together
Partnerships and other forms of collaboration were identified as an effective way to pool resources and enable outcomes that may not otherwise be achieved due to scale. Partnerships could be with other ports, research institutions, or organisations focused on port sustainability. Opportunities to collaborate and shift away from individual, bespoke investments and designs and move towards multi-port implementation would enable efficiencies, particularly in green technology uptake and associated training, but also in utilising centralised resources. These approaches should leverage existing centralised functions where these already exist such as the Pacific Maritime Transport Alliance, SPC (The Pacific Community) and the Maritime Technology Corporation Centre.

Through collaborations and partnerships and centralising resources, the challenges associated with access to equipment, resources and specialist skills could be addressed. Central coordination of vehicles, equipment and technology could allow:

- Coordinated planning / shared timelines to leverage collective buying power for upgrades to low emissions technologies.
- Centralised procurement and management of equipment, vehicles, spare parts and equipment, and vessels for emergencies.
- Standardised training and support for PICs.
- Replicability/ lesson sharing across ports.

In addition to centralised coordination of physical resources, templates for environmental monitoring, management plans, role descriptions, emission calculators or similar documents and tools for ports to readily adopt would reduce collective effort towards achieving positive outcomes.

References
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