

A Blue Transformation for Maritime Transport in the Pacific

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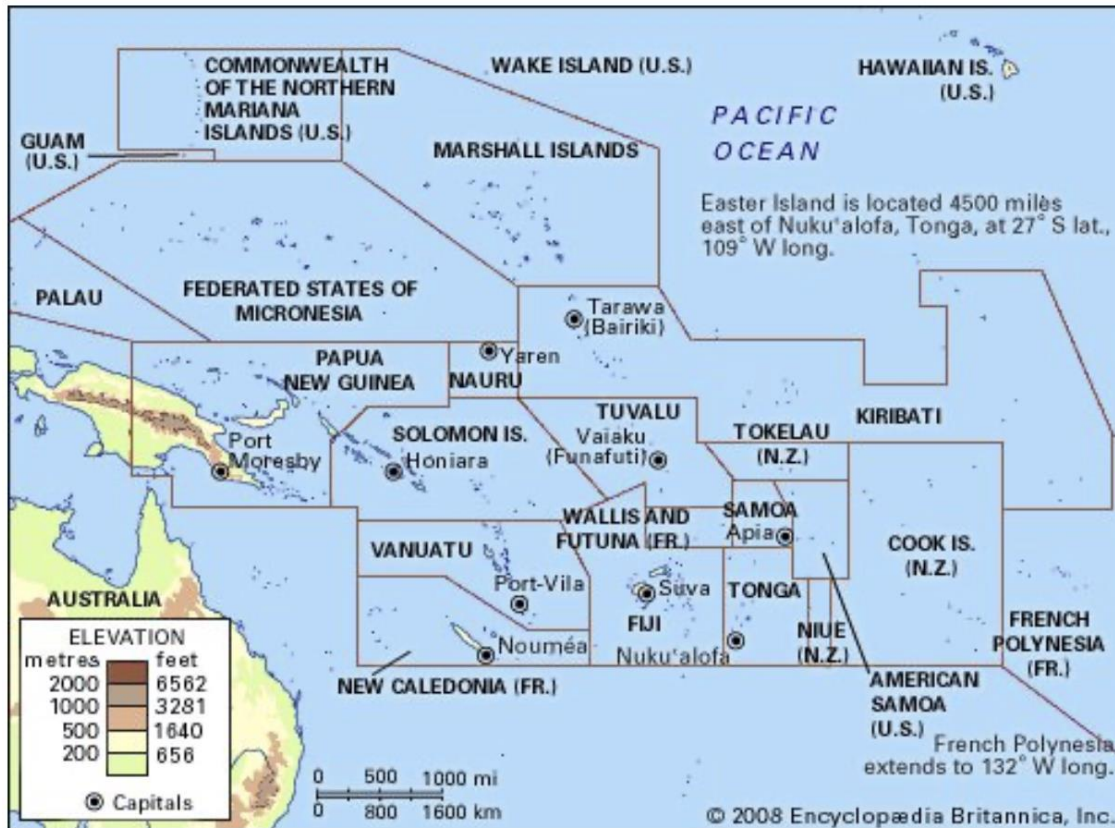
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Section 1: Overview

Maritime Challenges in the PICs

The Pacific Island countries (PICs) are a diverse set of island states facing similar challenges that constrain opportunities for economic growth and poverty reduction in PICs

Map¹: PICs and their Maritime Domain



Source: Britannica 2008

PICs are facing **similar challenges** as follows...

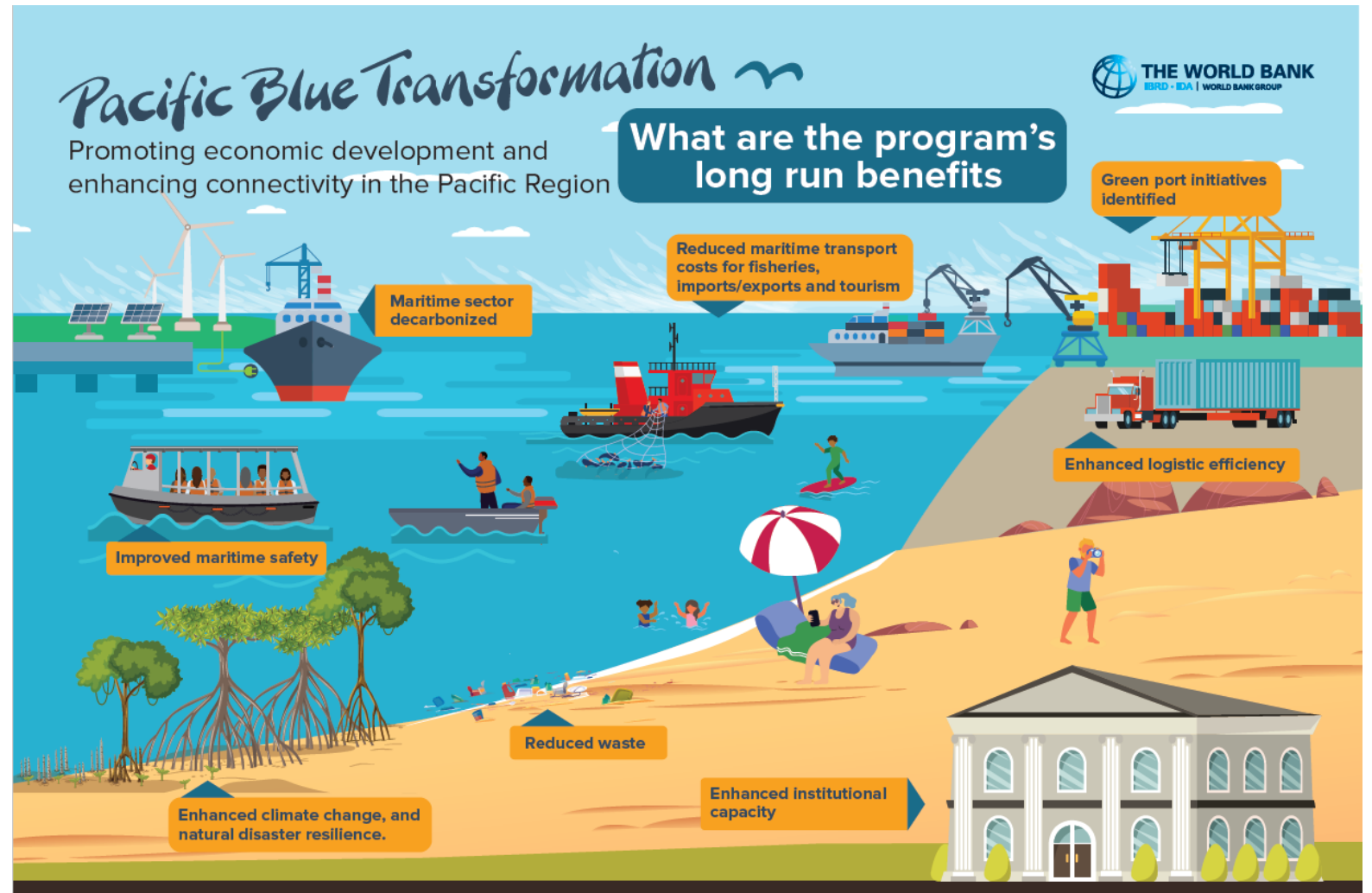
- ⊖ Small geophysical and population size, remoteness, dispersion, and lack of economy scale
- ⊖ High exposure to economic shocks, climate change, and natural disasters
- ⊖ Under-supported maritime connectivity network with high logistics costs and low efficiency
- ⊖ Challenges in safety practice and oversight in the existing maritime transport networks
- ⊖ Seaport/coastal pollution and GHG emissions are a growing concern
- ⊖ Infrastructure is often not designed with climate resilient standards and not adequately maintained, intensifying vulnerability to climate change
- ⊖ Fragile institutional capacity and a lack of institutional coordination and regional planning

The ASA – Blue Transformation for Pacific Maritime Transport

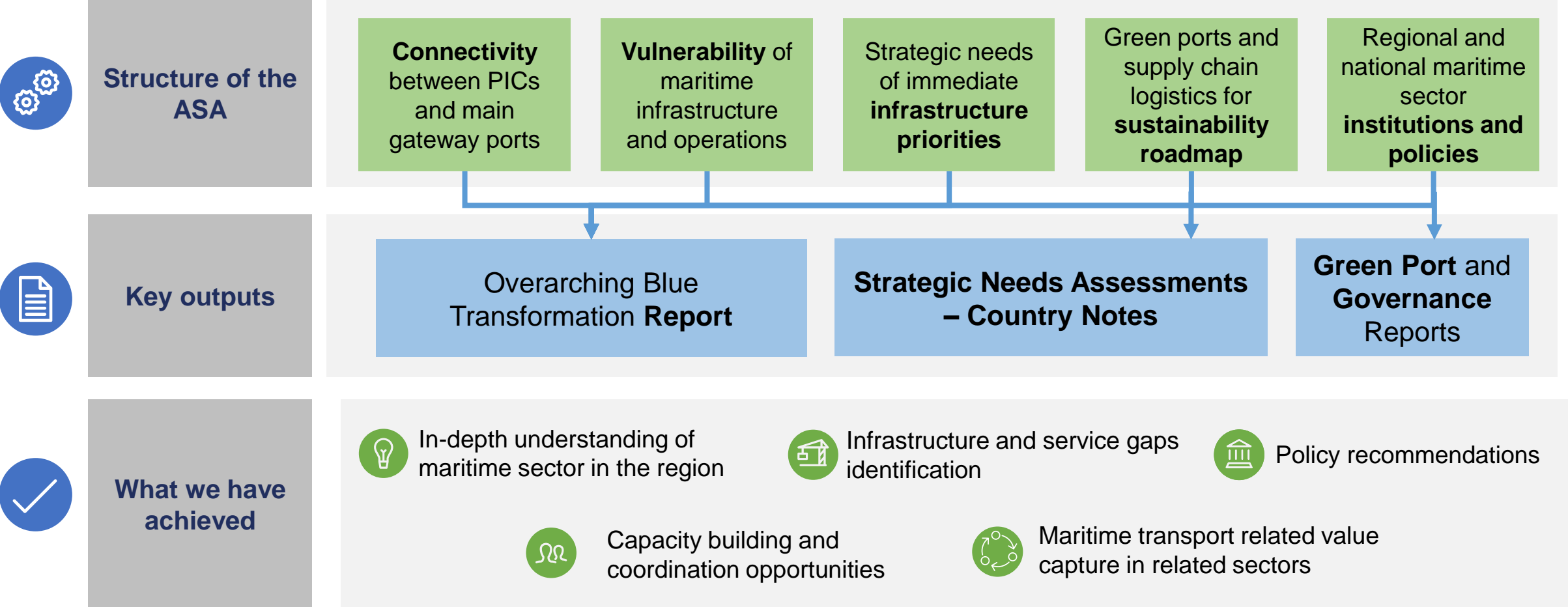
Development objective



To better understand Int'l regional and domestic maritime sector issues in the Pacific and **identify infrastructure and capacity gaps** to guide the second-generation maritime operations for the Bank in the PICs



Structure and Output of the ASA





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Section 2: Pacific Maritime Sector Assessment/ Main Findings

Key Messages



What are in the Pacific Island Countries' DNA?

- ❑ Geographical remoteness and dispersion
- ❑ Small economies of scale
- ❑ Challenging supply chain with long shipping routes
- ❑ High trade imbalance due to import dependence
- ❑ High vulnerability to climate change



What worked well and shall sustain?

- ❑ **International shipping** is sufficient to meet the current needs
- ❑ **Gateway ports** are generally of the right scale and type, However some require additional capacity/reconfiguration
- ❑ Good **regional governance architecture** and long history of cooperation among PICs



Where do the biggest opportunities lie?

- ❑ **Domestic connectivity:** infrastructure, services, and safety
- ❑ **Resilience:** integrating into port planning and design, early warning system, emergency response
- ❑ **Infrastructure asset management**
- ❑ Better liaison across **regional and national governance** for better outcomes








What ambitious goal posts may require re-think?

- ❑ Trade balance and food self-sufficiency
- ❑ Energy security and decarbonization
- ❑ Cruise ship tourism
- ❑ Value capture from large scale tuna fishing

Key Characteristics of Maritime Transport Sector in the PICs

The characters of maritime transport sector and its role in socio-economic development in the Pacific Islands are largely determined by the unique qualities of the PICs economic geography.

Unique economic geography constraints of PICs

-  Small and disperse populations over various islands and vast expanse of ocean
-  Small land area and narrow economic base¹ for agriculture or industry, hence, imports dependent
-  A limited natural and human resource base¹
-  Remoteness and distance from external major markets and international shipping routes
-  A high degree of vulnerability to external shocks and unplanned events (e.g., natural disasters)

“DNA” in PIC Maritime Transport unlikely to change

- ⊖ Low trade volume resulting in natural monopolies for ports and in some shipping services
- ⊖ Low export volumes and high empty container returns
- ⊖ Very long shipping distance
- ⊖ High cost of transport
- ⊖ Lower shipping service frequency and longer transit times
- ⊖ The use of smaller multi-purpose vessels for both cargo and passengers to the scale and type of service needed
- ⊖ High probability of disruptions in the maritime transport network due to natural disasters or external shocks to supply chain (e.g., Covid19)

Note: (1) – PNG and Fiji maybe the exceptions

International Shipping – Key findings

Services generally fit-for-purpose, consistent, reliable, and optimized to meet local needs. Conventional interventions unlikely to significantly improve service or shipping cost for PICs.

What we have learnt

- 💡 PICs **rely heavily on maritime shipping for imports** (e.g., food, fuel, construction materials) more than elsewhere
- 💡 High shipping cost mainly due to **numerous immutable factors** such as lack of scale, high rate of empty container returns and long shipping distance
- 💡 Shipping routes are generally **well-established** and served by multiple long-standing private carriers¹
- 💡 Shipping services are **fit-for-purpose, quite consistent, reliable²**, and **already optimized** to meet local needs and port infrastructure³



Implications and Opportunities:

⚠️ **Conventional solutions** (e.g., enhancing international connectivity, increasing competition among carriers, implementing a hub-and spoke model) **are unlikely to significantly improve service or cost**

🎯 **Overall aim:** To **maintain** consistent, reliable, cost-effective service of appropriate type, capacity, frequency, and affordability that ensures supply resilience and security

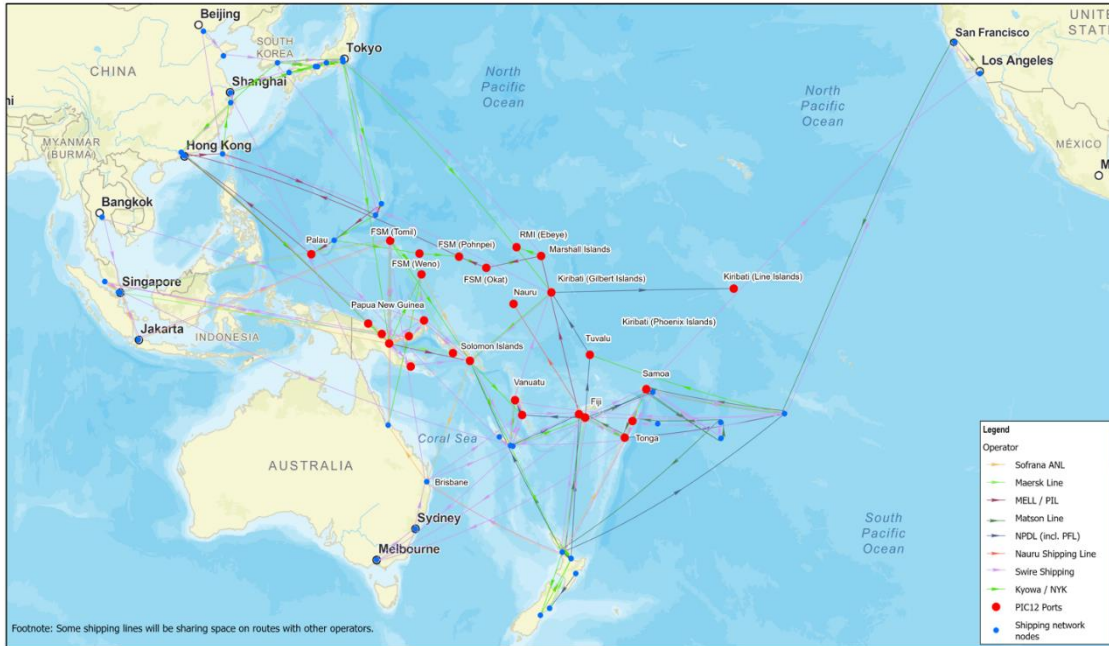
🔗 Opportunities:

- Explore **oversight mechanisms** to monitor, examine, and influence pricing and service level
- Consider **new shipping models** for underserved island countries such as Nauru and Tuvalu
- Capture some of the **economic activity from shipping** such as ship repairs and seafarer crew recruitment

Note: (1) – Except for Nauru and Tuvalu which are served by only one carrier; (2) – Supply chain disruption due to Covid19 might be an extreme exception, (3) – Typical use of multi-purpose container ship with ship-mounted cranes due to the absence of shore cargo cranes at the majority of PIC ports

International Shipping - Network, major operators and type of container ships

Map: International shipping network in the Pacific Islands region



There are **03 distinct shipping routes...**

.... which are served by **8 operators...**

- 1 **Shuttle services** between larger Pacific rim ports and a small number of larger gateway ports in PICs
- 2 **'Milk-run' services** that connect multiple PICs to Pacific rim ports on longer route 'strings'
- 3 **Intra-regional services** between PICs that do not connect with the Pacific rim ports

- 1 ANL – Sofrana
- 2 Kyowa Shipping
- 3 Maersk Line
- 4 MEL / PDL
- 5 Matson Line
- 6 NPDL
- 7 Nauru Shipping
- 8 Swire Shipping

A typical ship type on international routes in the Pacific Islands

- **Multi-purpose** general cargo and container ships which have **ship mounted cranes** are required for PICs
- Gateway ports in PICs **do not have rail mounted ship-to-shore container cranes**
- Some mobile cranes in the shorelines (only 2 PICs), but they are **underutilized** due to **outages** or **preference for geared ships**

At Port Vila, Vanuatu



At Apia Port, Samoa



Gateway Ports – Key findings

Most gateway ports generally of the right size and type. Yet, numerous challenges persist: lack of gateway port alternatives, multi-user inadequacy and aging port infrastructure, and “build-neglect-rebuild” phenomenon.

What we have learnt

- Each PIC typically relies on **1 or sometimes 2 major gateway ports**, generally of the right size and type
- Yet, there might be a **lack of port alternatives** in case of extreme events
- Ports are typically **multi-user facilities** and shorelines for international and domestic types of ship/cargo/warehouses, but some are **inadequate with aging infrastructure**
- Generally, **not congested** but still **inefficient** to handle container ships due to **legacy issues** such as warehouses and absence of ship-to-shore container cranes¹
- Current port charges are attached to legacy tariffs and often **not reflective of true costs** of service provision
- “**Build-neglect-rebuild**” phenomenon in PICs potentially leading to quick asset degradation due to lack of funding for maintenance

✿ Opportunities:

- **Strategic and master planning** for sustainability, capacity, and resilience
- **Port modernization / Reconfiguration** along with hinterland/domestic network upgrade via **long-term, whole life-cycle contracts** and increased private participation
- **Better asset management** with budgeting certainty and planned maintenance
- Support for **financial sustainability** via reforming port charges, private services & management, etc.
- Consider **collective regional approach** for setting port charges and ready access to support port management and decision-making

Note: (1) – Ports of Lautoka and Suva have mobile cranes, but they are underutilized due to outages and preference of ships cranes

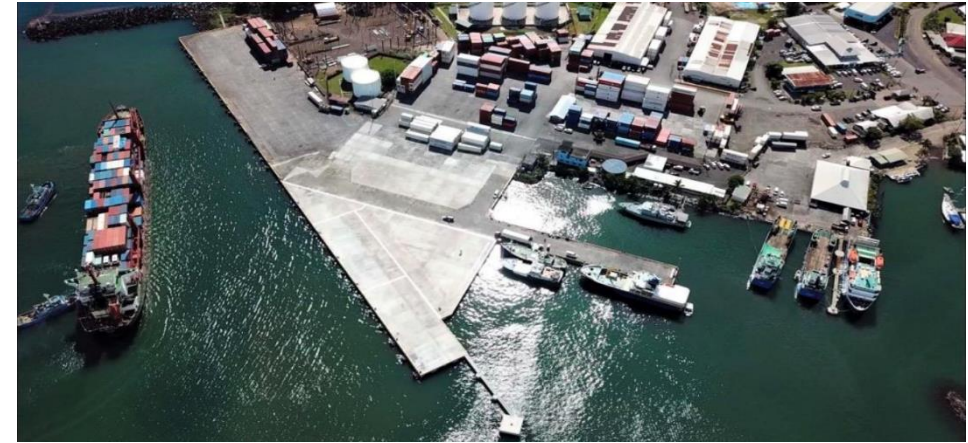
Gateway Ports – selected facilities in the PICs

Gateway ports are multi-user facilities (e.g., cargo, ferry, fishery, cruise, government agency, warehouse, etc.) with no rail mounted ship-to-shore cranes.

Container ship and fisheries fleet at Pohnpei Port, Micronesia



International Terminal Multi Users Port with no shore cranes at Apia Port, Samoa



Legacy Warehouses on Wharf Deck at Port Lautoka, Fiji



Cruise Ship at Main Wharf in Port Vila, Vanuatu



Lapetasi Wharf and Terminal Port Vila, Vanuatu



Domestic Shipping and Infrastructure – Key findings

Domestic shipping is a vital service to connect people, services and freight to outer islands. There is urgent need for improving maritime safety as well as outer island services and infrastructure via a multi-faceted long-term approach.

What we have learnt

- Inter-island shipping is a **vital** service, but **difficult** and **expensive to provide especially for outer islands**
- **Franchise Shipping Scheme (subsidized)** that ensures adequate services to outer islands has been canceled or scaled back due to budget constraints
- Many outer islands **lack appropriate docks** and **jetties** to safely unload cargo or disembark passengers
- **Significant safety risk** due to aging unsafe vessels, operational practices, non-compliance and lack of oversight, lack of a safety culture, etc.
- **Unsuitable** and **end-of-life vessels** often used by domestic operators due to **lack of financing and maintenance facilities**. Not adaptable for new technology to reduce GHG emission.

🎯 **Overall aim:** Urgent need for **improving infrastructure, domestic shipping services and safety**, through a multi-faceted long-term approach

🔗 **Opportunities:**

- Improve **outer island port infrastructure**
- **Enhance overall safety** in domestic shipping
- Identify models for **financial sustainability** of domestic shipping, especially non-profitable routes
- **Strengthen regulations and enforcement** capacity, especially regarding safety
- **Reduce fossil fuel use** and GHG emissions for medium-to-long term benefits
- Life cycle **management of vessels** (fit-for-purpose, adaptable, maintenance) slipways & shipyards
- Increase **training** and seafarer workforce development

Resilience of Maritime Transport – Key findings

The World Risk Report identifies the Pacific as a hotspot for climate change and disaster risk, with Vanuatu, Tonga, Solomon Islands, PNG, Fiji and Kiribati listed in the 20 countries most at risk and vulnerable to disasters globally.

What we have learnt



The PICs are exposed to tropical cyclones, swell waves, earthquakes, volcanic activity and potential tsunami inundation in various intensity



Majority of older maritime infrastructure in PICs fails to meet seismic and cyclone intensity building standards



Wave hazards combined with sea level rise have the potential to make many ports unviable without adaptation



Regional hub ports in PNG, Solomon Islands, Samoa, and Fiji are directly in the zone of multiple hazards



Top 4 ports by exposure are Nuku'alofa (Tonga), Luganville (Vanuatu), Suva (Fiji), and Apia (Samoa)



PICs urgently need site specific coastal vulnerability and geophysical hazard assessments to better understand exposure of coastal infrastructure to changing climate conditions and natural hazards



Overall aim: Build resilience, adaptations, and emergency response plans in the maritime sector in relation to natural hazards and climate change



Opportunities:

- Integrate natural hazard and climate change risk into the strategic and master planning for ports
- Scale up investment in retrofitting and developing resilient maritime infrastructure commensurate to exposures and the effects of sea level rise
- Build redundancy into the maritime transport networks to reduce disruption to services
- Enhance early warning system, emergency responses, and post-disaster recovery ability
- Enhance collaboration between regional, national and sub-national port authorities and strengthen institutions
- Invest in non-structural resilient measures to combat the effects of climate change

Resilience of Maritime Transport – Multi-hazard heat chart in PICs

Nuku'alofa (Tonga), Luganville (Vanuatu), Suva (Fiji) and Apia (Samoa) are the top 4 ports by exposure due to their location at a confluence of natural hazards – cyclone genesis, seismic activity, significant wave height along with high level of criticality

Country	Port	Port Category	Wave Fetch Conditions (1)	T/Cyclone Gust Speed (km/h) (2)	T/Cyclone Wave Height (m) (3)	Regional Storm Wave Height (m) (4)	Coastal Flooding (m) (5)	Tsunami Max.			SLR (SSP5-8.5, 2050) (m) (9)
								Inund. Height (m) (6)	Earthquake PGA (g) (7)	Volcanic Hazard Level (8)	
Tonga	Nuku'alofa	Primary	Open	178	9.1	4.1	1.3	1.5	0.27	Medium	0.27
Vanuatu	Luganville	Primary	Open	141	6.7	3.3	1.5	1.8	0.30	High	0.24
Samoa	Apia	Primary & Hub	Open	159	7.9	3.0	1.5	1.1	0.09	Low	0.31
Fiji	Suva	Primary & Hub	Open	136	6.4	2.7	2.0	1.3	0.28	Low	0.26
Fiji	Laukota	Primary	Open	135	6.3	4.0	0.6	0.9	0.10		0.25
Solomon Islands	Honiara	Primary & Hub	Limited by Western Province Islands	116	3.2	2.2	0.8	1.7	0.19	High	0.22
FSM	Weno	Primary	Open	88	3.5	3.2	1.5	0.8			0.24
Solomon Islands	Noro	Primary	Semi-enclosed	91	2.8	2.2	0.6	1.5	0.19	High	0.22
Vanuatu	Port Vila	Primary	Sheltered	140	0.7	2.2	1.0	1.6	0.43	Low	0.25
PNG	Motukea	Primary & Hub	Semi-enclosed	79	1.0	2.5	2.5	2.9	0.05	Low	0.22
Marshall Islands	Majuro	Primary	Limited by lagoon	90	1.7	2.7	1.2	0.9			0.27
Tuvalu	Funafuti	Primary	Limited by lagoon	87	1.2	3.0	1.4	1.1	0.11		0.25
Nauru	Aiwo	Primary	Open	1	0.0	2.5	1.4	1.0			0.25
Palau	Koror	Primary	Semi-enclosed	157	1.1	2.2	0.9	1.1	0.03		0.25
FSM	Pohnpai	Primary	Enclosed	188	1.0	2.7	1.8	1.0			0.27
FSM	Okat	Primary	Enclosed	152	0.7	2.6	1.7	0.9			0.25
PNG	Lae	Primary & Hub	Open	38	1.1	2.2	1.3	0.9	0.17	Low	0.22
FSM	Tomil	Primary	Semi-enclosed	127	0.7	2.7	1.7	0.8			0.25
Kiribati	Betio	Primary	Open	24	0.6	1.3	1.4	1.0			0.25

Higher combined hazards -->

Lower combined hazards <---

Colour Legend:

High
Medium
Low
Very Low
Not applicable

Green Ports Assessment of Ports in PICs

Priorities for Action

• Indicators



Greenhouse gas emissions



Energy use and efficiency



Climate change risk and adaptation



Air pollutants



Noise pollution



Light pollution



Liquid waste



Solid waste



Biodiversity



Biosecurity

Indicators that generally had no baseline monitoring being undertaken. Opportunity to establish future **monitoring and evaluation**.

Indicators most engaged with by ports. Motivated by **opex reduction, benefits of renewables**, experience with **damage recovery** from natural hazards.

Waste infrastructure was a priority area for investment, however, was considered **out of influence** for ports and requires wider government action. **Renewable energy** largely also considered out of influence.

Regional Governance and Coordination – Key findings

Getting institutional governance right is a precursor to effective policy development and delivery. Improved governance at regional and national levels can help deliver better maritime sector outcomes

What we have learnt



International obligations can be an outsized burden on PICs and distract attention from pressing issues in domestic shipping



A **well-established regional architecture** with a long history of successful cooperation and regional solidarity already exists



There is a **large gap** between the Pacific MOU model legislation and current implementation



External support is not always well matched to regional planning and objectives, and is often poorly coordinated



Limited legal, technical, and financial resources in the maritime sector **stretch PIC ability** to delivery outcomes



Lack of **dedicated national policies** for the maritime sector



Regulation for domestic shipping (including safety) is a critical gap



International



Regional



National



Overall aim: Improve governance at regional and national levels for better outcome delivery of maritime safety, security, environmental protection and efficiency transport



Opportunities:

- PICs need to **identify their priorities** and intended outcomes when adopting international conventions
- PICs must determine relevant and practical strategies and follow through with **effective implementation**
- **Critical gap in regulation** for domestic shipping (including safety) needs to be closed
- **Dedicated national policies** for the maritime sector need to be considered
- **Maritime regulators** should be viewed as centers of national expertise in maritime and supported according
- More effort is needed to effectively coordinate programs, projects and support from international and regional partners

