

Asia-Pacific Regional Forum on Connecting to
Global Supply Chains through Inter-Regional Land
Corridors and Maritime Routes
22-23 June 2022



Sub-regional strategies to enhance maritime connectivity in the ASEAN and the Pacific Region

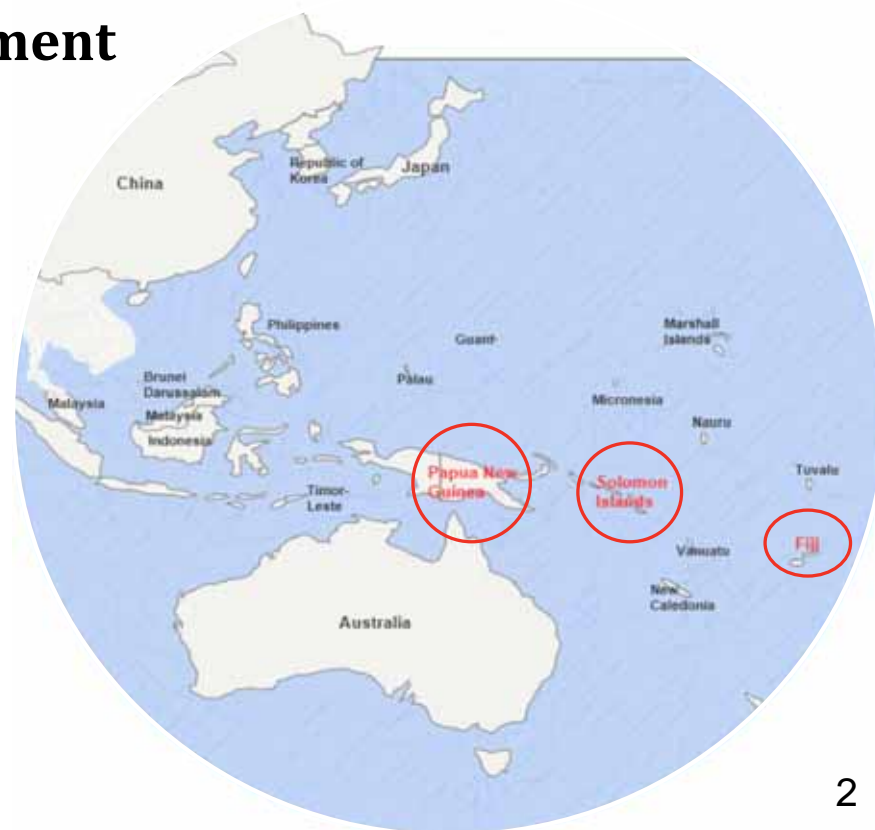
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Aims of my presentation

- To deliver the results of analysis of **maritime connectivity** in sub-regions
- To propose direction of further development

▶ Analysis Scope

- 3 Small Island Developing States (SIDS) in the Pacific: **Papua New Guinea (PNG), the Solomon Islands and Fiji**
- 3 targeted Member States of the UNESCAP: **Thailand, Malaysia, and Indonesia**

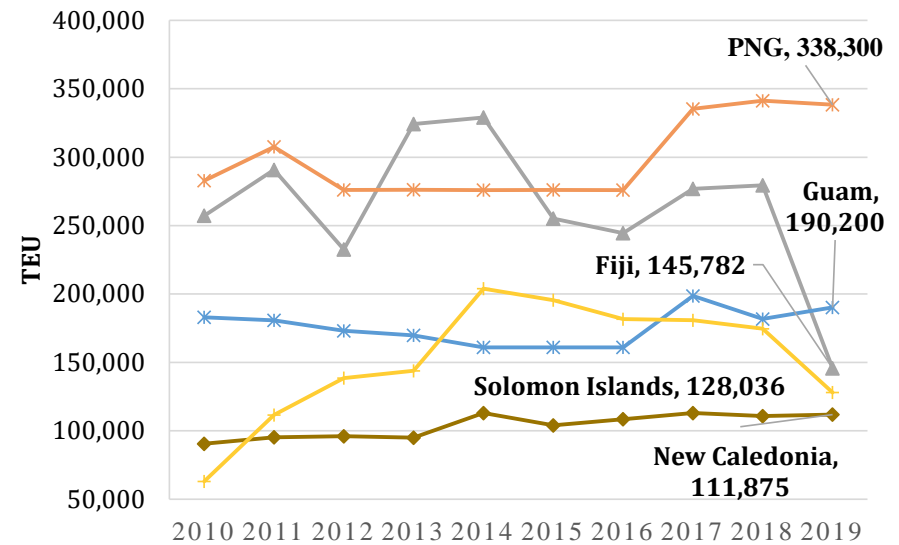


Brief Scanning of the Pacific: Container port throughput in SIDS, 2010-2021

➤ Annual Container port throughput in SIDS (Unit: TEU)

| PI Country | Port | 2010 | 2015 | 2018 | 2019 | Rank (2019) |
|----------------------------------|-----------------------------------|-----------|-----------|-----------|------------------|----------------------|
| American Samoa | Pago Pago | 59,168 | 70,288 | 90,246 | 76,215 | |
| Cook Islands | Rarotonga | 3,996 | 16,937 | 10,619 | 8,106 | |
| Fiji | Lautoka, Suva | 257,316 | 255,214 | 279,465 | 145,782 | 3 |
| French Polynesia | Papeete | 70,000 | 69,296 | 69,140 | 69,166 | |
| Guam | Apra | 183,000 | 161,000 | 181,800 | 190,200 | 2 |
| Kiribati | Betio | 29,876 | 35,149 | 52,568 | 52,100 | |
| Marshall Islands | Majuro | 19,700 | 41,855 | 70,146 | 30,711 | |
| Micronesia (Federated States of) | Pohnpei | 6,570 | 9,815 | 32,195 | 25,234 | |
| Nauru | Nauru | .. | 9,438 | 7,607 | 5,327 | |
| New Caledonia | Noumea | 90,574 | 104,000 | 110,750 | 111,875 | 5 |
| Niue | Alofi | .. | 4,031 | 3,878 | 3,904 | |
| Northern Mariana Islands | Saipan Island | 24,446 | 41,920 | 42,096 | 44,952 | |
| Palau | Koror | 24,446 | 23,891 | 20,059 | 16,399 | |
| Papua New Guinea (PNG) | Lae, Madang, Port Moresby, Rabaul | 282,907 | 276,089 | 341,300 | 338,300 | 1 |
| Samoa | Apia Pago Pago (American) | 22,465 | 27,719 | 27,524 | 27,221 | |
| Solomon Islands | Honiara, Noro | 63,095 | 195,524 | 174,614 | 128,036 | 4 |
| Tonga | Nukualofa | 48,431 | 50,408 | 105,190 | 76,854 | |
| Tuvalu* | Port Funafuti | 1,719 | 13,766 | 6,188 | 5,150 | |
| Wallis and Futuna Islands* | Futuna | 1,719 | 13,766 | 6,188 | 5,150 | |
| Total (TEU) | | 1,189,428 | 1,420,106 | 1,631,574 | 1,360,682 (100%) | 67.1% (Top five PIC) |

➤ Annual container port throughput in TEU for the top five SIDS



The **increase** in total container volumes over the period is **very small**, compared to other regions.

Brief Scanning of the Pacific: LSCI of the selected countries

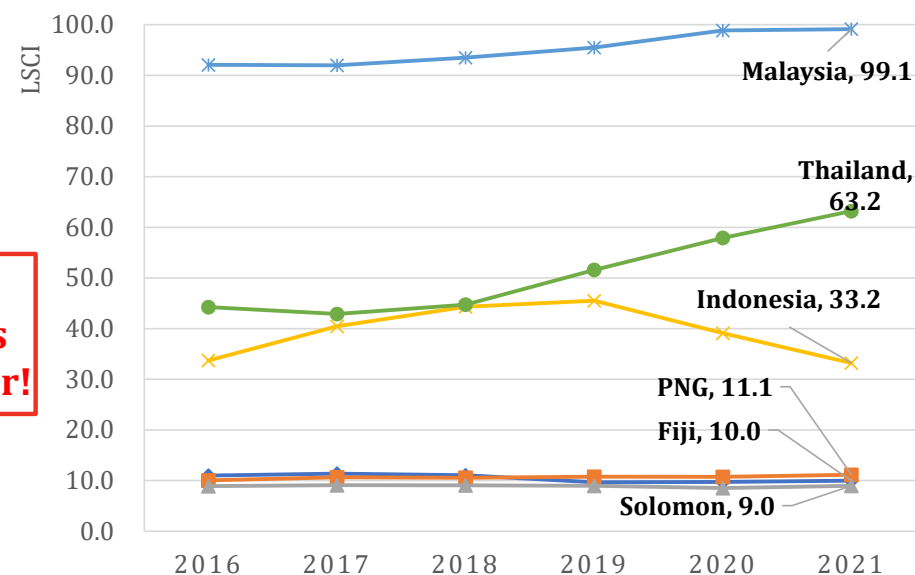
➤ LSCI of the selected countries, 2016-2021

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------------------------|------|------|------|------|------|------|
| PNG | 10.0 | 10.6 | 10.6 | 10.7 | 10.7 | 11.1 |
| Fiji | 11.0 | 11.4 | 11.0 | 9.7 | 9.7 | 10.0 |
| Solomon Islands | 8.9 | 9.1 | 9.1 | 9.0 | 8.5 | 8.8 |
| Thailand | 44.2 | 42.9 | 44.7 | 51.6 | 57.9 | 64.6 |
| Malaysia | 92.1 | 92.0 | 93.5 | 95.5 | 98.9 | 99.0 |
| Indonesia | 33.7 | 40.5 | 44.3 | 45.5 | 39.1 | 33.1 |

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Nine times Lower!



Source: Beyond 20/20 WDS - Table view - Liner shipping connectivity index, quarterly (unctad.org)
<https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

PFS have not shown any significant improvement in liner shipping connectivity.

Brief Scanning of the Pacific: PIC's international trade with China

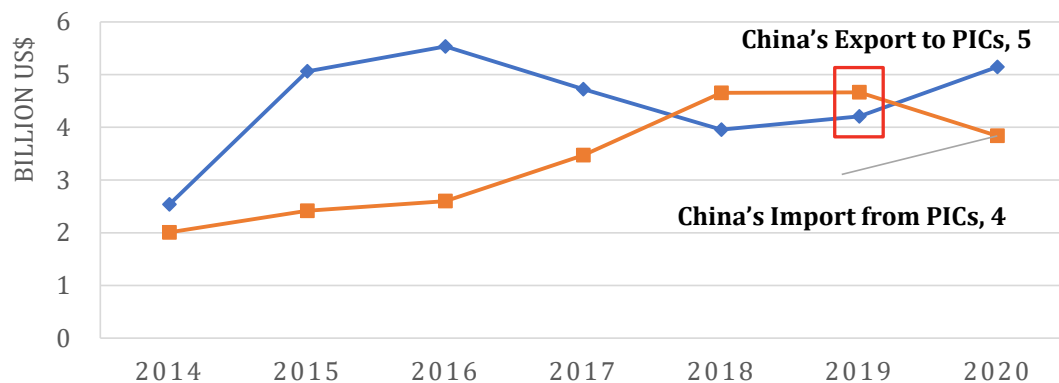
➤ PIC trade share of the China's total international trade amount in the period 2014-2020

(Unit: US\$)

| Year | China total international trade (trillion) | Total trade amount with PIC (billion) | PIC's share of China's total international trade (%) |
|------|--|---------------------------------------|--|
| 2014 | 4.31 | 4.54 | 0.11 |
| 2015 | 3.88 | 7.48 | 0.19 |
| 2016 | 3.66 | 8.13 | 0.22 |
| 2017 | 4.07 | 8.20 | 0.20 |
| 2018 | 4.60 | 8.61 | 0.19 |
| 2019 | 4.57 | 8.87 | 0.19 |
| 2020 | 4.66 | 8.98 | 0.19 |

➤ PIC's share out of China's total international trade amount is relatively **very small, less than 0.22%**.

➤ China's trade balance trend with PIC in the period 2014-2020



➤ China's **import** trade amount from PIC is always **lower** than **export**.

➤ Since the outbreak of the COVID-19, China's import from PIC is declining, while China's export is increasing.

Brief Scanning of the Pacific: PIC's international trade with Japan

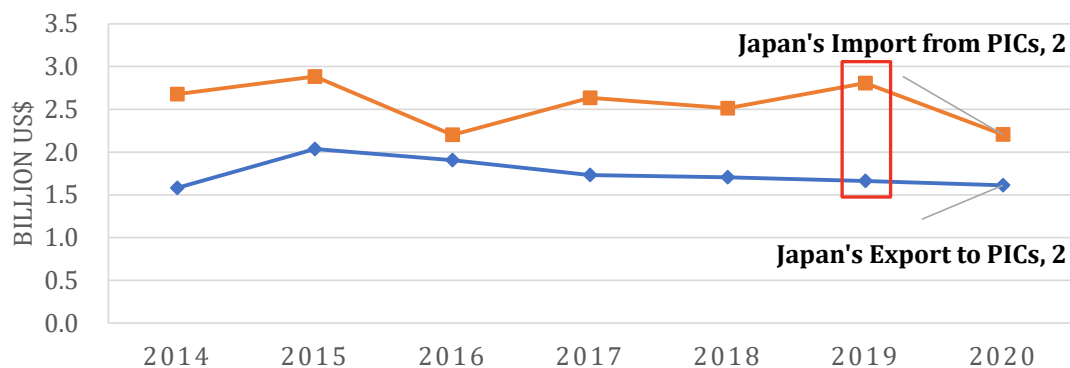
➤ PIC trade share of the Japan's total international trade amount in the period 2014-2020

(Unit: US\$)

| Year | Japan total international trade (trillion) | Total trade amount with PIC (billion) | PIC's share of Japan's total international trade (%) |
|------|--|---------------------------------------|--|
| 2014 | 1.51 | 4.26 | 0.28 |
| 2015 | 1.27 | 4.92 | 0.39 |
| 2016 | 1.26 | 4.11 | 0.33 |
| 2017 | 1.37 | 4.37 | 0.32 |
| 2018 | 1.48 | 4.22 | 0.28 |
| 2019 | 1.43 | 4.47 | 0.31 |
| 2020 | 1.28 | 3.82 | 0.30 |

➤ PIC's share out of Japan's total international trade amount is also **very small**, but slightly higher than China.

➤ Japan's trade value trend with PIC in the period 2014-2020



➤ Japan's **import** trade amount from PIC is always **higher** than **export**.

➤ Since the outbreak of the COVID-19, Japan's trade value with PIC is declining.

Hybrid approach to exploring maritime connectivity in the ASEAN and the Pacific Region

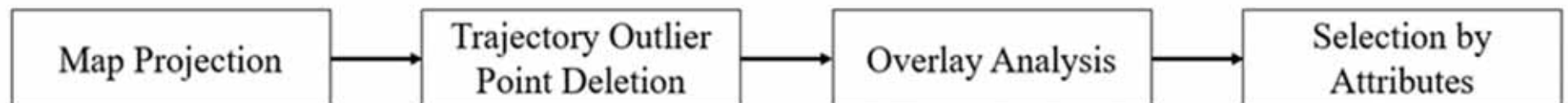
- 1. Automated Identification System (AIS) Analysis and Company cases**
 - ship types and ship operation routes serving in the Pacific
- 2. Global Trade Analysis Project (GTAP)**
 - Impact of port infrastructure investment on the demand for port capacity with 3 scenarios (3, 5, 10% increase of port investment)
- 3. International trade pattern analysis**
 - between China and the Pacific
 - between Japan and the Pacific

1. Automated Identification System (**AIS**) Analysis: Data processing

AIS Purpose

- AIS** {
- ✓ Examines the movement of vessels between PICs and targeted countries (Thailand, Malaysia and Indonesia, **TMI**) and
 - ✓ Shows major trading countries of PIC.

Flow Chart of the AIS data Processing



1. AIS Analysis Results: Maritime Connectivity between TMI and PICs



Connectivity Route Result

Thailand-PIC



Legend



Malaysia-PIC



Legend



Indonesia-PIC



Legend



1. AIS Analysis Result: **Vessel types** on the routes from TMI to PFS

➤ Vessel types serving from TMI to PFS

| Vessel type | Thailand to | | | Malaysia to | | | Indonesia to | | | Total |
|--|-------------|------|-----|-------------|------|----|--------------|------|-----|---------------------|
| | PNG | Fiji | SI* | PNG | Fiji | SI | PNG | Fiji | SI | |
| Container ship | 25 | | 4 | 208 | | 5 | 1,172 | | 28 | 1,442(24.3%) |
| Oil and chemical tanker | 3 | | | 133 | | 26 | 621 | | 448 | 1,231(20.7%) |
| General cargo ship | 8 | | 22 | 98 | | 40 | 803 | | 173 | 1,144(19.2%) |
| Bulk carrier | | | | 49 | | 2 | 965 | | 44 | 1,060(17.8%) |
| Gas tanker | | | 1 | 13 | | 3 | 38 | | 2 | 57(1.0%) |
| Specialized cargo ship, heavy load carrier | | | | 4 | | | 26 | | | 30(0.5%) |
| Ro-Ro cargo ship, vehicles carrier | 8 | | | 2 | | | 1 | | | 11(0.2%) |
| Tanker, Hazardous category A | | | | | 2 | | | 1 | | 3(0.1%) |
| Other, landing craft | | | | | | | 577 | | | 577(9.7%) |
| Service ship | | | | | | | 192 | | | 192(3.2%) |
| Passenger ship | | | | 10 | | | 32 | | 5 | 47(0.8%) |
| Offshore vessel, offshore support vessel | | | | 3 | | | 40 | | | 43(0.7%) |
| Fishing vessel | | | | 2 | | | 6 | | | 8(0.1%) |
| Tug | | | | | | | 91 | | 7 | 98(1.6%) |
| Total | | | | | | | | | | 5,943 (100%) |

82%

Note: * SI stands for Solomon Islands. Fiji had no record of their ship calls in the AIS database.

- Container, Oil & Chemical tanker, General cargo ship, and Bulk carrier: **82% of the total ship (5,943).**
- PNG received the largest number of container ship calls, followed by Solomon Islands.



Ship type and size serving in the Pacific: **Kyowa**, Matson, Swire shipping co.

➤ *Kyowa Shipping*

- **Nine (9) semi-container ships/multi-purpose vessels** with rampway and cargo gears as at.
- Deadweight ton: ranging 8,635 to 18,144.
- Ship length: ranging 117 m to 160m.
- Cargo gear (KT): Eight (8) ships have 40x2 cargo gear, except one ship with 30x2.



| Vessel Name | Kyowa Stork | Kyowa Falcon | Kyowa Rose | Kyowa Orchid | Pacific Condor | Tropical Islander | South Islander | Pacific Islander II | Coral Islander II |
|------------------------|------------------|------------------|------------------|------------------|----------------|-------------------|----------------|---------------------|-------------------|
| Flag | Marshall Islands | Marshall Islands | Marshall Islands | Marshall Islands | Panama | Japan | Japan | Japan | Panama |
| Built | 2018 | 2018 | 2010 | 2009 | 1999 | 2009 | 2007 | 2003 | 2002 |
| D/W (KT) | 12,084 | 12,084 | 12,191 | 12,122 | 8,635 | 18,144 | 18,091 | 17,916 | 17,913 |
| L.O.A | 143 | 143 | 124.71 | 124.71 | 117.72 | 160.73 | 160.7 | 160.73 | 160.73 |
| Rampway (KT) | 30 | 30 | 30 | 30 | 45 | 15 | 15 | 10 | 10 |
| Cargo Gear (KT) | 40 x 2 | 40 x 2 | 40 x 2 | 40 x 2 | 30 x 2, 25 x 1 | 40 x 2 | 40 x 2 | 40 x 2 | 40 x 2 |

Ship type and size serving in the Pacific: **Kyowa**, Matson, Swire shipping co.

➤ *Kyowa Shipping*

➤ **South Pacific Service**

Offers service with 4 multi-purpose vessels of D/W 18,000 KT.

✓ **Ports of Call:**

Busan, Kobe, Nagoya, Yokohama, Tarawa, Honiara, Port Vila, Santo, Noumena, Suva, Lautoka, Nukualofa, Apia, Pago Pago, Papeete, Funafuti

✓ **Ports for Transship Service:**

China, Taiwan, Hong Kong, Philippines, Vietnam, Thailand, Singapore, Malaysia, Indonesia, Australia, New Zealand, Europe

Ship type and size serving in the Pacific: Kyowa, **Matson**, Swire shipping co.

➤ **Matson Shipping**

- The fleet consists of full containers, semi-container ships, and a car carrier.
- Deadweight ton: ranging 4,657 to 51,257.
- Ship length: ranging 345ft to 869ft.
- Max. Speed: 14knts to 23.5knts.
- TEUs: 335 to 3,500.



| Vessel Route /Name | Anchorae /Kodiak /Tacoma | Daniel K. Inouye /Kaimana Hila | Imua /Liloa II | Kamokuii | Lurline /Matsonia | Manoa /Mahimahi | Manulan /Maunawii /Manukai | Maunalei | Mokihana | Papa Mau | R.J. Pfeiffer | Haleakala | Mauna Loa | Waialeale (car carrier) | Olomana (semi-container) |
|--------------------|--------------------------|--------------------------------|----------------|----------|---------------------------------------|-----------------|----------------------------|----------|----------|----------|---------------|-----------|-----------|-------------------------|--------------------------|
| Length (ft) | 710 | 854 | 388 | 411 | 869 | 860 | 711 | 681 | 860 | 381 | 713 | 350 | 350 | 345 | 397 |
| Max. Speed (knots) | 20 | 23.5 | 15 | 16 | 23 | 23 | 23 | 22 | 23 | 14 | 23 | | | | 18.3 |
| Max. DWT (LT) | 37,473 | 50,794 (DKI) 50,981 (KMH) | 8,071 | 8,490 | 51,257 (Lurline) 50,562 (Matsonia) | 30,187 | 29,517 | 33,771 | 29,484 | 5,364 | 27,100 | 4,658 | 4,657 | 5,621 | 8,252 |
| TEUs | 1,668 | 3,220 | 630 | 700 | 3,500 | 2,824 | 2,378 | 1,992 | 1,323 | 521 | 2,245 | 335 | 335 | | |
| Autos | | | | | | | | | | | | | | 230 | |

Ship type and size serving in the Pacific: Kyowa, Matson, **Swire** shipping co.

➤ **Swire Shipping**

- Merged “Westwood Shipping” having **four (4) 2,000 TEU con-bulkers** to complement the Swire Shipping flexible multi-purpose fleet. (Lloyd’s list News, **28 April 2022**).

➤ **Pushing transpacific trade**



M/V Chefoo; Photo: Swire Shipping



M/V Changsha; Photo: Swire Shipping

➤ **M/V Chefoo**, Joined in **2020**.

- Service route: South East Asia - PNG & Solomon Islands
- **2,400 TEU, containerised** and **non-containerised** cargo carrier.
- 30,400 deadweight, dimensions of 186m length, 32.2m breadth and 10.5m draught.



Connecting global supply chains to the Pacific Islands, including mainly PNG.

➤ **M/V Changsha**, Joined in **2020**.

- Service route: South East Asia - PNG & Solomon Islands



M/V WESTWOOD VICTORIA (Source: Wilmington, R., Lloyd’s list News, 28 Apr 2022.).

2. Global Trade Analysis Project (**GTAP**) model

Computable general equilibrium (CGE) model

- ✓ Analyze the effects of port construction and the introduction of an advanced port operating system.

GTAP ---a global CGE model

- ✓ Providing key data necessary for the CGE



Aggregation scheme of the GTAP Data Base

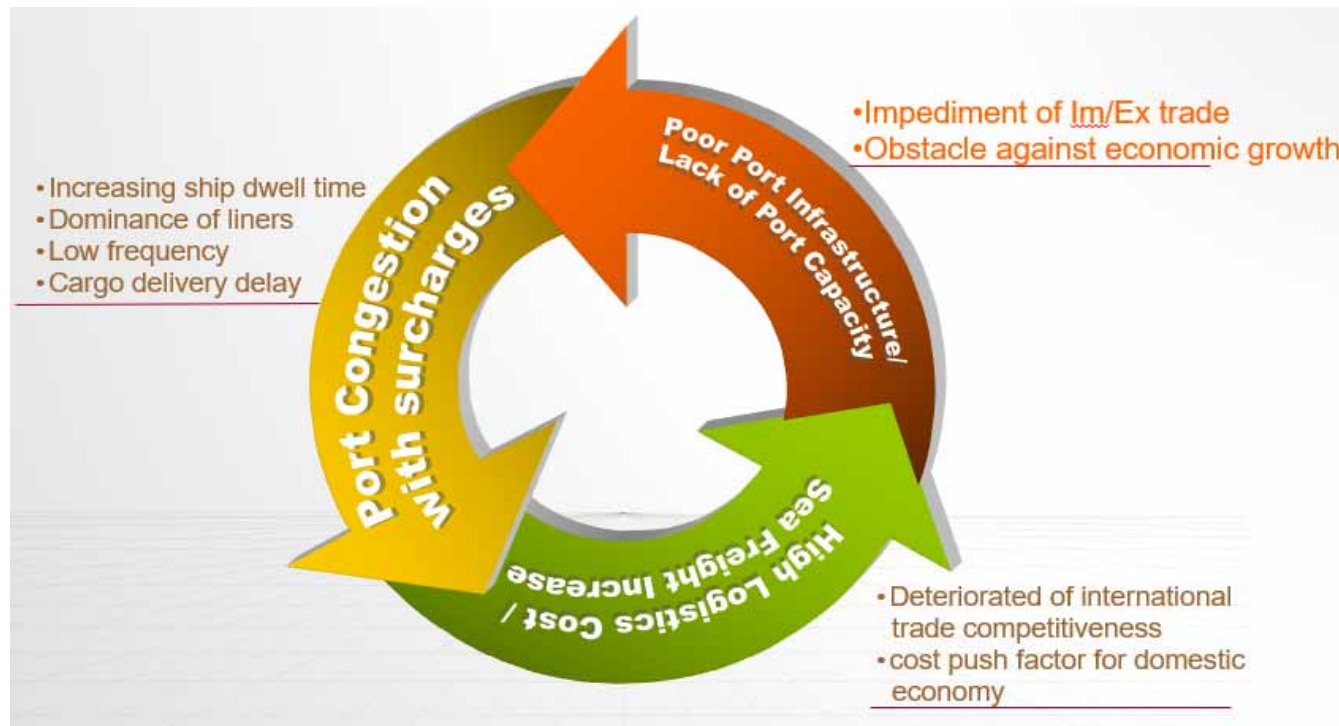
| Aggregation | |
|-----------------------|---|
| Country/region | Micronesia (XOC), Australia and New Zealand (ANZ), China, Japan, Korea, US, Thailand, Indonesia, Malaysia, Rest of World (ROW) |
| Sectors | Agriculture and processed food (AGR), transportation (TRANS), electric and electrical products (ELEC), other manufacturing (OthMFN), maritime services (WTP), other services (OthSRV) |

Vicious circle caused by poor port infrastructure in the Pacific

Poor port infrastructure investment in the Pacific



Obstacle in improving maritime connectivity



2. GTAP Test results: Impact of port infrastructure investment on the demand for port capacity

➤ Port investment increase: 3 Simulation Scenarios

- Three scenarios of 3%, 5%, and 10% increase in port infrastructure investment.
- Each impact of estimation in 2025, 2030, and 2035. (Unit: TEU)

| | The Pacific | ANZ | China | Japan | Korea | US | Thailand | Indonesia | Malaysia | ROW |
|--|-------------|--------|-------|-------|-------|-------|----------|-----------|----------|-------|
| Improvement of port infrastructure by 3% | | | | | | | | | | |
| 2025 | 4,478 | -197 | 744 | 405 | 327 | 181 | -12 | 17 | 13 | 289 |
| 2030 | 8,688 | -353 | 1,354 | 773 | 586 | 330 | -23 | 27 | 20 | 356 |
| 2035 | 12,654 | -474 | 1,879 | 1,092 | 800 | 433 | -34 | 33 | 25 | 235 |
| Improvement of port infrastructure by 5% | | | | | | | | | | |
| 2025 | 7,327 | -323 | 1,212 | 663 | 533 | 287 | -20 | 27 | 21 | 521 |
| 2030 | 14,092 | -569 | 2,195 | 1,248 | 953 | 515 | -39 | 43 | 33 | 594 |
| 2035 | 20,349 | -757 | 3,020 | 1,749 | 1,288 | 684 | -58 | 53 | 39 | 350 |
| Improvement of port infrastructure by 10% | | | | | | | | | | |
| 2025 | 14,014 | -615 | 2,320 | 1,267 | 1,024 | 565 | -38 | 53 | 39 | 963 |
| 2030 | 26,396 | -1,054 | 4,132 | 2,318 | 1,799 | 989 | -77 | 84 | 61 | 1,084 |
| 2035 | 37,341 | -1,367 | 5,574 | 3,182 | 2,385 | 1,303 | -112 | 100 | 72 | 702 |

2. GTAP Test results: Impact of port infrastructure investment on the demand for port capacity

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- Three scenarios of 3%, 5%, and 10% increase in port infrastructure investment.
- Each impact of estimation in 2025, 2030, and 2035.

(Unit: TEU)

| Year | 3 % Increase | | | 5 % Increase | | | 10% Increase | | |
|------|--------------|-------------|-------|--------------|-------------|-------|--------------|-------------|--------|
| | Total | The Pacific | Other | Total | The Pacific | Other | Total | The Pacific | Other |
| 2025 | 6,244 | 4,478 | 1,766 | 10,247 | 7,327 | 2,920 | 19,592 | 14,014 | 5,577 |
| 2030 | 11,757 | 8,688 | 3,069 | 19,065 | 14,092 | 4,973 | 35,733 | 26,396 | 9,337 |
| 2035 | 16,642 | 12,654 | 3,987 | 26,718 | 20,349 | 6,369 | 49,180 | 37,341 | 11,840 |

Note: Others include Thailand, Malaysia, Indonesia, ANZ, China, Korea, US, rest of the world (ROW).

- Increases in **port infrastructure investment** contributes to **improving demand** for container cargo services.
- In 2035 under the 10% investment increase scenario. The demand for 37,341 TEUs would be created in the Pacific's shipping services, being about **2/3** of the global increase 49,180 TEUs.

3. International Trading pattern analysis: PICs with **China** and Japan

➤ China's Export-Import with PIC, 2014-2020

Covid-19



(Unit: million dollars)

| Pacific Island Countries | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Rank (2014) | Rank (2020) |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| Cook Islands | 21.1 | 17.4 | 4.4 | 13.2 | 7.6 | 44.0 | 8.1 | | |
| Federated States of Micronesia | 14.7 | 15.8 | 23.1 | 38.3 | 40.4 | 31.3 | 28.2 | | |
| Fiji | 340.2 | 352.0 | 417.1 | 386.0 | 481.7 | 364.6 | 346.2 | 5 | 5 |
| Kiribati | 23.5 | 48.7 | 36.0 | 16.9 | 18.0 | 22.1 | 24.7 | | |
| Marshall Islands | 1279.0 | 3399.3 | 3995.1 | 3102.8 | 2190.1 | 2429.8 | 3282.2 | 2 | 1 |
| Nauru | 2.8 | 5.0 | 1.7 | 0.5 | 2.0 | 1.2 | 2.0 | | |
| Niue | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Palau | 10.5 | 22.0 | 20.7 | 17.6 | 13.9 | 18.7 | 24.5 | | |
| PNG | 2055.1 | 2875.1 | 2330.5 | 2838.8 | 3596.3 | 3866.8 | 3209.2 | 1 | 2 |
| Samoa | 56.1 | 65.6 | 74.2 | 65.5 | 70.5 | 88.4 | 88.0 | | |
| Solomon Islands | 523.4 | 544.1 | 479.4 | 656.6 | 750.0 | 560.3 | 472.2 | 3 | 4 |
| Tonga | 24.0 | 30.5 | 31.7 | 28.9 | 25.1 | 29.6 | 34.0 | | |
| Tuvalu | 4.6 | 16.3 | 5.6 | 18.4 | 12.2 | 21.8 | 16.1 | | |
| Vanuatu | 187.1 | 86.5 | 73.1 | 81.2 | 79.1 | 91.4 | 80.5 | | |
| French Polynesia | 54.2 | 96.9 | 58.4 | 64.9 | 81.9 | 105.0 | 103.9 | | |
| New Caledonia | 422.8 | 592.4 | 582.8 | 866.3 | 1238.2 | 1196.0 | 1263.9 | 4 | 3 |
| Total Amount (billion US\$) | 5.0 | 8.2 | 8.1 | 8.2 | 8.6 | 8.9 | 9.0 | | |

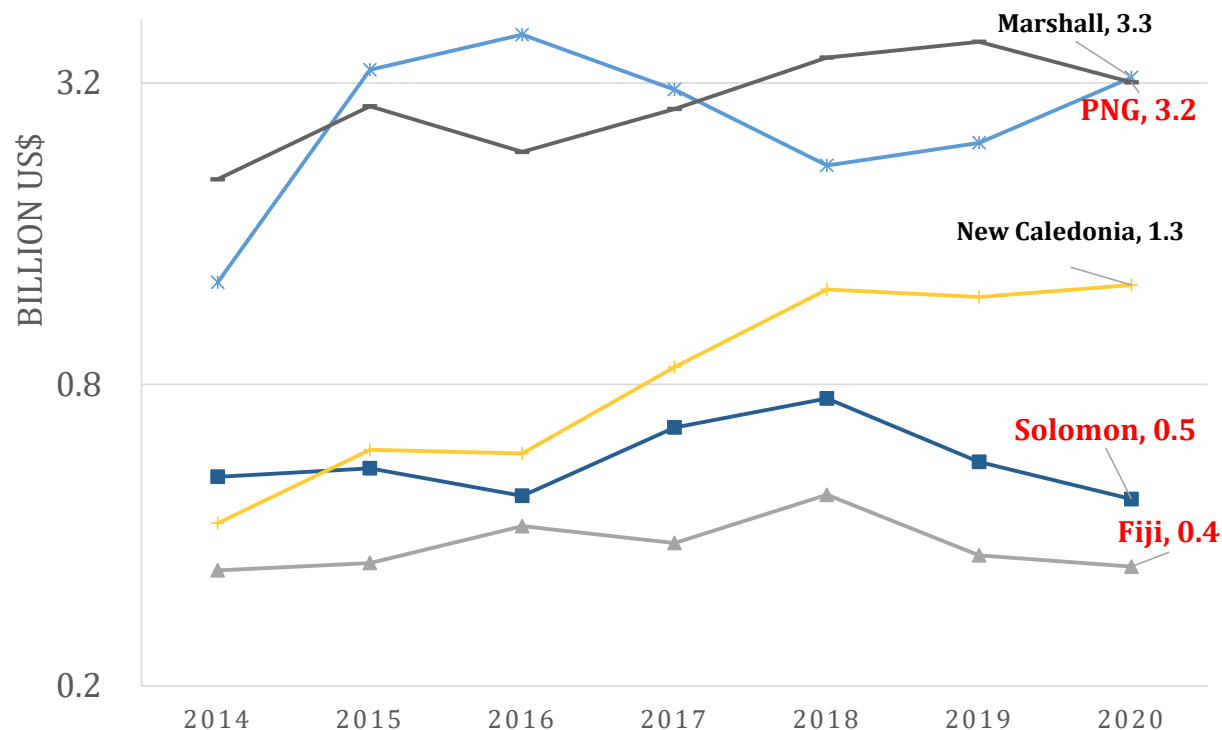
Marshall I.:
China's biggest
trading partner.

➤ China's **total trade amounts** with the selected Pacific Islands increased from 5 billion US\$ in 2014 to 9 billion US\$ in 2020, showing approximately **84% growth** over the past six years

PICs international trading pattern with China

- China's total trade amounts with the selected Pacific Islands increased from 5 billion US\$ in 2014 to 9 billion US\$ in 2020, showing approximately **84% growth** over the past six years
- Top five in the Pacific (ranking order): Marshall, **PNG**, New Caledonia, **Solomon**, **Fiji**.

China's top five trading countries in the Pacific, 2014-2020.



PICs international trading pattern with China

➤ China's export item changes with the target countries in the Pacific, 2016-2019, 2019-2020

| PI | Key Items | Wood, Articles of Wood; Wood Charcoal | Edible Preparations of Meat, Fish, Crustaceans Etc | Fish, Crustaceans & Aquatic Invertebrates | Textile Art Nesoi; Needlecraft Sets; Worn Text Art | Salt; sulphur; earths and stone; plastering materials, lime and cement | Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax | Cereals | Ships, Boats And Floating Structures | Total Value change (%) |
|---------|------------------------------|---------------------------------------|--|---|--|--|--|---------|--------------------------------------|------------------------|
| PNG | Changes in 2016-2019 (>±80%) | | | 82% | | | | -90% | | 20% |
| | Changes in 2019-2020 (>±80%) | 84% | | | 82% | | | | -80% | 15% |
| Fiji | Changes in 2016-2019 (>±80%) | | 107 | | | -89% | | | | -12% |
| | Changes in 2019-2020 (>±80%) | | | | | | -87% | | | -8% |
| Solomon | Changes in 2016-2019 (>±80%) | | 91% | | | | | | 863 | -4% |
| | Changes in 2019-2020 (>±80%) | | | 81% | | | 122% | 3619 | | 18% |

➤ Major items with changes in higher ± 80% in PFS:

2016-2019: Highly increased items: 'Meat, Fish' and 'Ships, Boats' and etc.

Highly decreased items: 'Mineral Fuel, Oil' and 'Salt; sulphur; earths and stone' and etc.

2019-2020: Highly increased items: 'Mineral Fuel, Oil' (Solomon) and 'Cereals' and etc.

Highly decreased items: 'Mineral Fuel, Oil' (Fiji) and 'Ships, Boats' and etc.

PICs international trading pattern with China

➤ China's import item changes with the target countries in the Pacific, 2016-2019, 2019-2020

| PI | Key Items | Fish, Crustaceans & Aquatic Invertebrates | Prep Veg., Fruit, Nuts or Other Plant Parts | Electric Mach. etc; Sound Equip; TV Equip; Pts | Wood And Articles Of Wood; Wood Charcoal | Nuclear Reactors, Boilers, Machinery Etc.; Parts | Ores, Slag and Ash | Miscellaneous Manufactured Articles | Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax | Nickel And Articles Thereof | Coffee, Tea, Mate & Spices | Vegetable plaiting materials & products nesoi | Animal Or Vegt. Fats, Oils, etc. & Waxes | Essential Oils; Perfumery, Cosmetic, Preps | others | Total Value Change % |
|---------|------------------------------|---|---|--|--|--|--------------------|-------------------------------------|--|-----------------------------|----------------------------|---|--|--|--------|----------------------|
| PNG | Changes in 2014-2019 (>±80%) | | | | | 33,418 | 331 | | 105% | 168 | 190% | | 84% | | -99% | 85% |
| | Changes in 2019-2020 (>±80%) | | | | | -98% | | | | | | 298 | | | 2435% | -25% |
| Fiji | Changes in 2014-2019 (>±80%) | -96% | 88% | | | 4,164 | | 702 | | | | | | 474 | | -16% |
| | Changes in 2019-2020 (>±80%) | | | -86% | 388 | -92% | | | | | 172 | | | | | 64% |
| Solomon | Changes in 2014-2019 (>±80%) | | | | | | 421 | | | | | | | | | 23% |
| | Changes in 2019-2020 (>±80%) | | | | | | | | | | | | | | | -23% |

➤ Major items with changes in higher ± 80% in PFS:

2016-2019: Highly increased items: 'Nuclear Reactors, Boilers, Machinery' and 'Miscellaneous Manufactured Articles' and etc.

Highly decreased items: 'Fish, Crustaceans' and etc.

2019-2020: Highly increased items: 'Wood And Articles Of Wood' and 'Vegetable plaiting materials' and etc.

Highly decreased items: 'Nuclear Reactors, Boilers, Machinery' and 'Electric Machinery' and etc.

3. International Trading pattern analysis: PICs with China and Japan

➤ Japan's Export-Import with Japan, 2014-2020

Covid-19



(Unit: million dollars)

| Pacific Islands | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Rank (2014) | Rank (2020) |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| Cook Islands | 19.5 | 14.4 | 19.5 | 20.9 | 17.9 | 14.4 | 16.1 | | |
| Federated States of Micronesia | 14.3 | 25.6 | 18.4 | 34.2 | 37.2 | 31.9 | 22.4 | | |
| Fiji | 122.6 | 108.6 | 152.5 | 115.1 | 136.6 | 119.3 | 72.7 | 3 | 3 |
| Kiribati | 38.2 | 38.1 | 25.6 | 21.6 | 14.6 | 13.0 | 12.0 | 5 | |
| Marshall Islands | 1213.6 | 1632.4 | 1475.0 | 1335.4 | 1342.3 | 1323.4 | 1295.3 | 2 | 2 |
| Nauru | 4.6 | 4.7 | 6.7 | 6.7 | 4.5 | 5.1 | 4.7 | | |
| Niue | 5.7 | 7.3 | 5.6 | 7.8 | 10.1 | 5.9 | 11.3 | | |
| Palau | 32.2 | 23.7 | 44.0 | 50.3 | 37.7 | 35.4 | 17.5 | | |
| PNG | 2653.4 | 2878.0 | 2183.9 | 2609.5 | 2462.7 | 2788.9 | 2251.4 | 1 | 1 |
| Samoa | 13.4 | 15.6 | 15.8 | 13.6 | 14.2 | 14.7 | 13.9 | | |
| Solomon Islands | 23.8 | 22.7 | 26.4 | 21.0 | 23.1 | 17.1 | 13.8 | 7 | 10 |
| Tonga | 13.0 | 7.7 | 8.1 | 8.8 | 15.1 | 14.2 | 7.8 | | |
| Tuvalu | 16.8 | 20.5 | 17.9 | 20.9 | 22.4 | 21.1 | 26.4 | | 5 |
| Vanuatu | 86.1 | 119.5 | 106.9 | 100.7 | 78.1 | 64.4 | 51.8 | 4 | 4 |
| Total Amount (billion US\$) | 4.3 | 4.9 | 4.1 | 4.4 | 4.2 | 4.5 | 3.8 | | |

93.7%

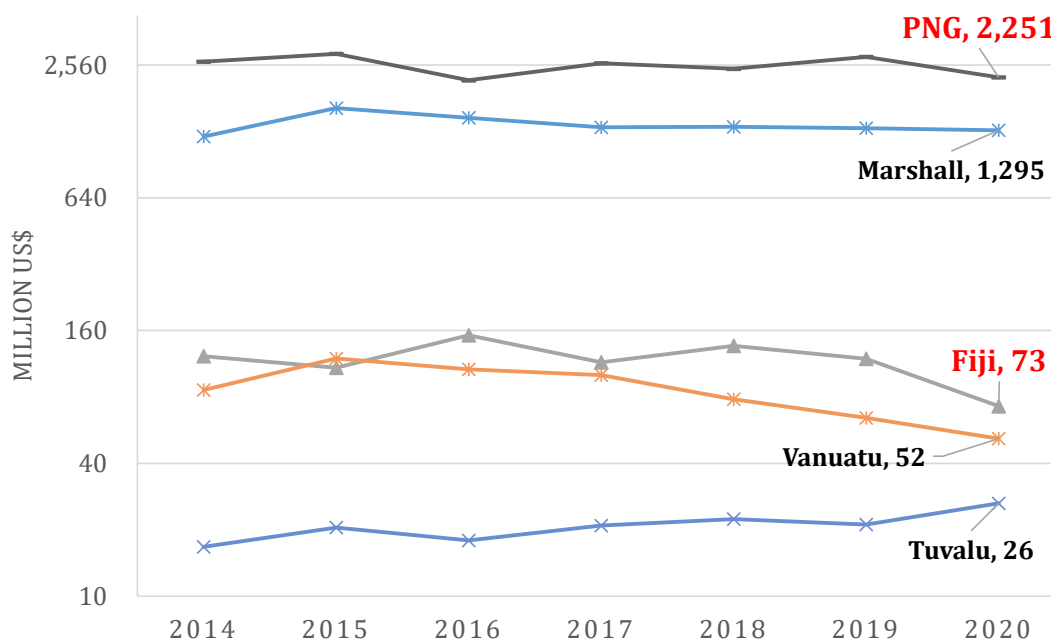
PNG:
Japan's biggest trading partner

- Japan's total trade amounts with the selected Pacific Islands from 4.3 billion US\$ in 2014 to 3.8 billion US\$ in 2020 **remained stable** over the past six years
- PNG, Marshall Islands, and Fiji account for **93.7%** of PICs trade amount with Japan.
- Pandemic has **negatively affected** the export-import trade between Japan and PIC.

PICs international trading pattern with Japan

- Japan's total trade amounts with the selected Pacific Islands from 4.3 billion US\$ in 2014 to 3.8 billion US\$ in 2020 remained stable over the past six years
- PNG, Marshall Islands, and Fiji account for **93.7%** of PICs trade amount with Japan.
- Pandemic has negatively affected the export-import trade between Japan and PIC.
- Japan's top five trading partners in the Pacific (ranking order): PNG, Marshall, Fiji, Vanuatu, Tuvalu.

Japan's top five trade countries in the Pacific, 2014-2020



PICs international trading pattern with Japan

➤ Japan's **export item changes (%)** with the target countries in the Pacific, 2016-2019, 2019-2020

| PI | Key Items | Food, Live Animals | Crude Materials | Mineral Fuels | Manufactured Goods | Paper | Textile Yarn, Fabrics | Non-Metallic Mineral Ware | Iron and Steel Products | Manufactures of Metals | Cycles with Engines | Aircraft | Ships and Boats | Misc. Articles | Total % changes |
|---------|------------------------------|--------------------|-----------------|---------------|--------------------|-------|-----------------------|---------------------------|-------------------------|------------------------|---------------------|----------|-----------------|----------------|-----------------|
| PNG | Changes in 2014-2019 (>±80%) | | | -100 | | | -87% | | | 715 | 214 | | | 96% | -19% |
| | Changes in 2019-2020 (>±80%) | -100 | 8% | | | 202 | 787 | | -88% | | | 195 | | | 8% |
| Fiji | Changes in 2014-2019 (>±80%) | 753 | | 85 | | -96% | 370 | | 1383 | | | | 1,810 | | 24% |
| | Changes in 2019-2020 (>±80%) | | | | | | | | | -86% | | | | | -46% |
| Solomon | Changes in 2014-2019 (>±80%) | 13,727 | -100% | 18,774 | | | | -100% | -99% | | 90% | | | | 1% |
| | Changes in 2019-2020 (>±80%) | -100% | | | 134 | | 111 | | 12,391 | | | | | | -5% |

➤ Major items with changes in **higher ± 80% in PFS:**

2014-2019: Highly increased items: **'Mineral Fuels'** **'Food and Live Animals'** and etc.

Highly decreased items: **'Crude Materials'** **'Mineral Fuels'** **'Non-Metallic Mineral Ware'** and etc.

2019-2020: Highly increased items: **'Iron and Steel Products'** (Solomon) **'Textile Yarn, Fabrics'** and etc.

Highly decreased items: and **'Food and Live Animals'** **'Iron and Steel Products'** (PNG) and etc.

PICs international trading pattern with Japan

➤ Japan's import item changes with the target countries in the Pacific, 2016-2019, 2019-2020

| PI | Key Items | Food and Live Animals | Fish and Fish Preperation | Coffee, Tea, Cocoa & Spices | Feeding- Stuff for Animals | Beverages and Tobacco | Crude Materials | Wood, Lumber and Cork | Crude Animals & Vegetable | Animal & Vegetable Oil, Fat | Manufactured Goods | Leather, Dressed Fur Skins | Machinery, Transport Equipment | Miscellaneous Articles | Special Commodities (Re-Import Goods etc) | Total |
|---------|------------------------------|-----------------------|---------------------------|-----------------------------|----------------------------|-----------------------|-----------------|-----------------------|---------------------------|-----------------------------|--------------------|----------------------------|--------------------------------|------------------------|---|-------|
| PNG | Changes in 2014-2019 (>±80%) | | | | 96% | -100% | | 272% | 107% | | 911% | 1112% | | | | 7% |
| | Changes in 2019-2020 (>±80%) | | | | 149% | | | | | -100% | -100% | | -100% | 314% | | -21% |
| Fiji | Changes in 2014-2019 (>±80%) | | | 413% | | | | | | -100% | | | | 263% | | -30% |
| | Changes in 2019-2020 (>±80%) | | | | | | | | | | | | -100% | -95% | 546% | -27% |
| Solomon | Changes in 2014-2019 (>±80%) | | | | | | -100% | | | | | | | -84% | -100% | -69% |
| | Changes in 2019-2020 (>±80%) | -82% | -82% | | | | | | | | | | | 227% | | -81% |

➤ Major items with changes in **higher ± 80% in PFS:**

2014-2019: Highly increased items: '**Leather, Dressed Fur Skins**' and '**Manufactured Goods**' and etc.

Highly decreased items: '**Animal & Vegetable Oil, Fat**' and '**Beverages and Tobacco**' and etc.

2019-2020: Highly increased items: '**Miscellaneous Articles**' and '**Re-Import Goods**' and etc.

Highly decreased items: '**Manufactured Goods**' and '**Machinery, Transport Equipment**' and etc.

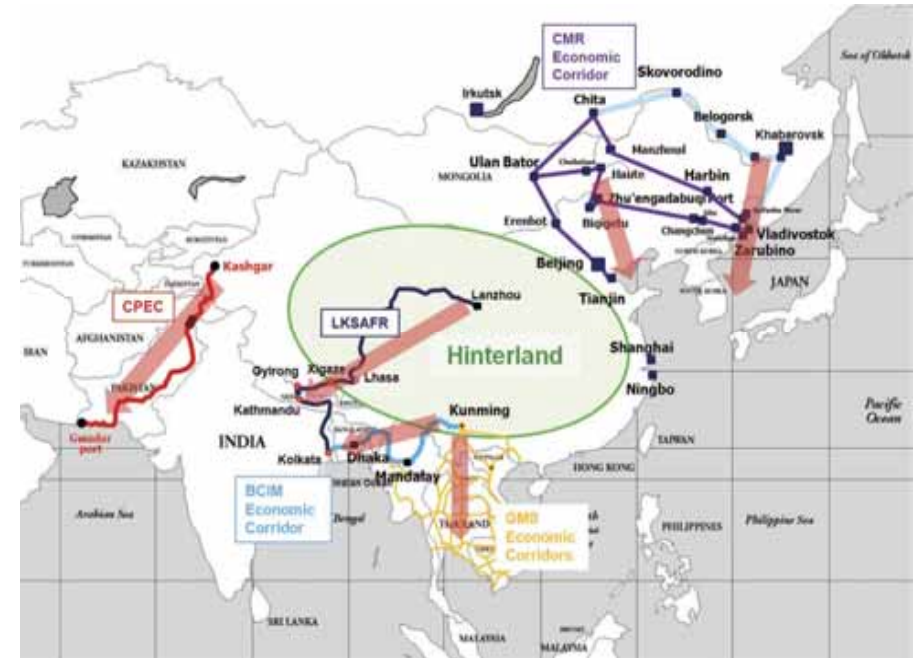
The Position of the Belt Road Initiative in the ASEAN and the Pacific

➤ China's New Maritime Silk Road



Source: Lee (2016,2017)

➤ Summary of economic and transport corridors in the BRI



Source: Lee, et al (2016). This map was reproduced in Lee, et al. (2018b), p.293.

Similarities between BRI and Transport Corridors of GMS (UNESCAP)

➤ Corridors in Greater Mekong Sub-region Economic Cooperation



Source: Lee (2016).

➤ Transport Corridors of GMS (UN ESCAP)



Source: www.gms-eoc.org

BRI infrastructure investment in sea transport sector in the ASEAN, 2013-2020

➤ BRI infrastructure investment in the World, 2013-2020

- Period: Jan. 2013 – Jan. 2020
- Number of participating countries : **98**

| Status | No. of project |
|--------------------------|----------------|
| Completed | 142 |
| Contract | 250 |
| MOU | 24 |
| Suspension/Cancellation | 14 |
| Under Construction (U/C) | 265 |
| Total | 695 |

Note: * Contract value basis available estimates, US\$bn unless otherwise indicated.

** Contract dates basis available information. Names, sectors, sub-sectors subjective; status basis available information.

Source: Clarkson Research, London (2020)

➤ BRI infrastructure investment in the transport sector of the ASEAN, 2013-2020

| Transport sector | No. of project | Completed | Contract | MOU | S/C | U/C |
|------------------|----------------|-----------|-----------|----------|----------|-----------|
| Seaport | 20 | 6 | 8 | 2 | 1 | 3 |
| Airport | 4 | 0 | 1 | 2 | 0 | 1 |
| Railway | 8 | 1 | 1 | 1 | 0 | 5 |
| Road/Highway | 7 | 1 | 1 | 0 | 1 | 4 |
| Total | 39 | 8 | 11 | 5 | 2 | 13 |

Notes: * MOU stands for memorandum of understanding. + S/C stands for Suspension/Cancellation. # U/C stands for under construction.

BRI infrastructure investment in the ASEAN, 2013-2020

➤ BRI Projects by Country (* The ASEAN in yellow)

| No. | Country | No. of project | No. | Country | No. of project | No. | Country | No. of project | No. | Country | No. of project |
|-----|------------------|----------------|-----------|--------------------|----------------|-----------|------------------|----------------|-----------|-------------------|----------------|
| 1 | Pakistan | 47 | 15 | Kenya | 13 | 29 | Kuwait | 7 | 43 | Tajikistan | 5 |
| 2 | Bangladesh | 46 | 16 | Angola | 12 | 30 | Mongolia | 7 | 44 | Bolivia | 4 |
| 3 | Indonesia | 46 | 17 | Egypt | 12 | 31 | Serbia | 7 | 45 | Brunei | 4 |
| 4 | Malaysia | 34 | 18 | Nigeria | 12 | 32 | Zimbabwe | 7 | 46 | Burundi | 4 |
| 5 | Russia | 22 | 19 | Ethiopia | 11 | 33 | Madagascar | 6 | 47 | Cameroon | 4 |
| 6 | SaudiArabia | 21 | 20 | SriLanka | 10 | 34 | Mozambique | 6 | 48 | Ghana | 4 |
| 7 | Laos | 20 | 21 | Tanzania | 10 | 35 | Thailand | 6 | 49 | Morocco | 4 |
| 8 | Myanmar | 19 | 22 | India | 9 | 36 | Turkey | 6 | 50 | Venezuela | 4 |
| 9 | Nepal | 18 | 23 | Iraq | 9 | 37 | Uganda | 6 | 51 | Algeria | 3 |
| 10 | Vietnam | 17 | 24 | P. N. Guinea | 9 | 38 | Ukraine | 6 | 52 | Armenia | 3 |
| 11 | Cambodia | 15 | 25 | Uzbekistan | 9 | 39 | Zambia | 6 | 53 | Belarus | 3 |
| 12 | Iran | 15 | 26 | Bosnia&Herz. | 8 | 40 | Guinea | 5 | 54 | Chad | 3 |
| 13 | Kazakhstan | 15 | 27 | Philippines | 8 | 41 | Oman | 5 | 55 | Congo-Brazzaville | 3 |
| 14 | UAE | 15 | 28 | Coted'Ivoire | 7 | 42 | Singapore | 5 | 56 | Djibouti | 3 |

BRI infrastructure investment in sea transport sector in the ASEAN, 2013-2020

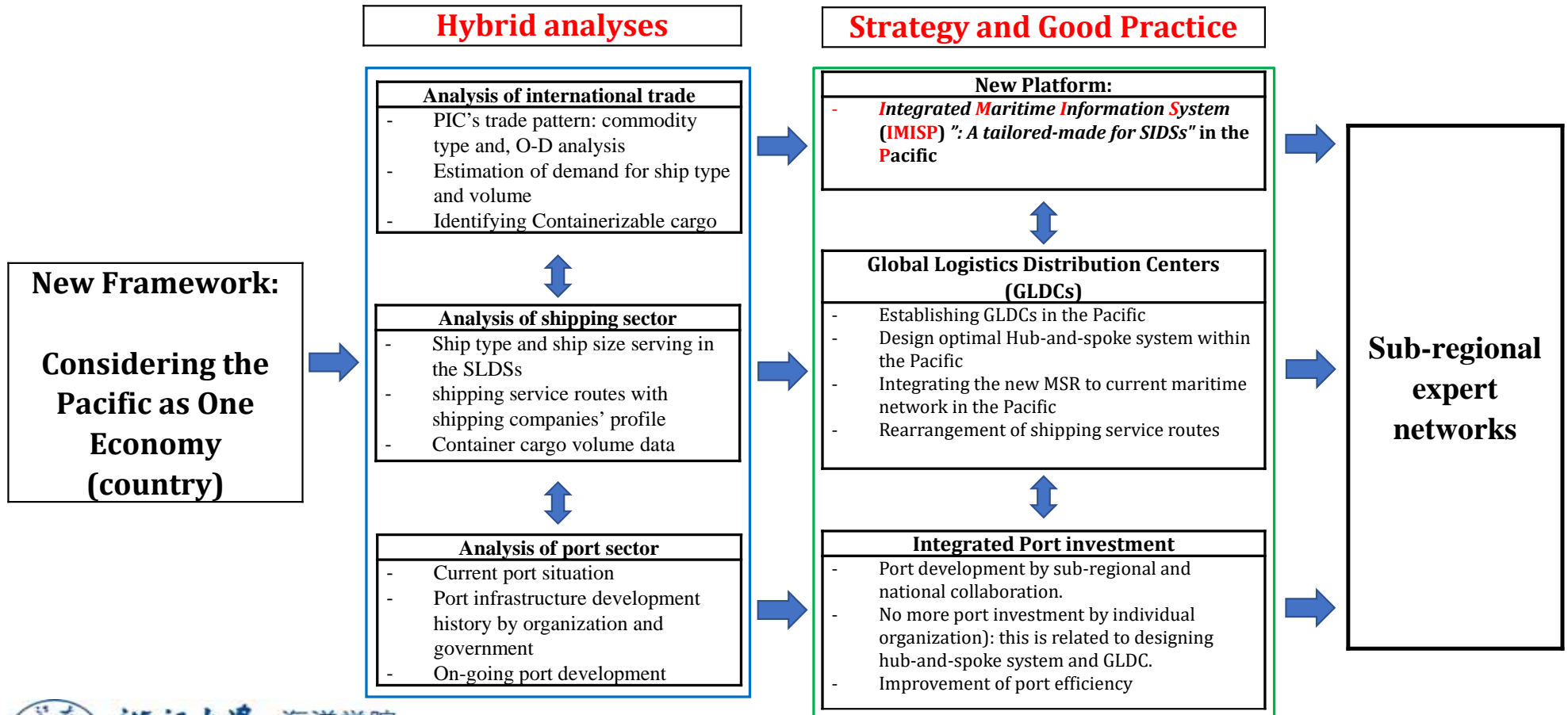
➤ BRI infrastructure in *sea transport sector* of the ASEAN Member States, 2013-2020

| ASEAN | No of Project | Name of project | Completed | Contract | MOU* | S/C+ | U/C# |
|--------------|---------------|------------------------------------|-----------|----------|----------|----------|----------|
| Brunei | 1 | Muara | 1 | | | | |
| Cambodia | 3 | Kampot, Koh Kong | | | 2 | | 1 |
| Indonesia | 3 | Bontang Jambi, Kuala Tanjung | | 2 | | | 1 |
| Laos | n/a** | - | - | - | - | - | - |
| Malaysia | 2 | Kuantan | 2 | | | | |
| Myanmar | 2 | Kyaukpyu, Thilawa | | 2 | | | |
| Philippines | 2 | Manila, Davao | | 1 | | 1 | |
| Singapore | 3 | Singapore | 2 | 1 | | | |
| Thailand | 3 | Laem Chabang | | 2 | | | 1 |
| Vietnam | 1 | Tra Vinh, Province Coastal port | 1 | | | | |
| Total | 20 | | 6 | 8 | 2 | 1 | 3 |

BRI infrastructure projects in the **transport sector of the Pacific, 2013-2020**

| MM-YR | Project Name | Project type | Country | Sector | Sub-Sector | Status |
|--------------|--|--------------|---------|----------------|----------------|-----------|
| Mar-20 | Kavieng Airport Upgrade | Airport | PNG | Infrastructure | Transportation | Contract |
| Mar-20 | Port Moresby Digital Television System | Seaport | PNG | Infrastructure | Property | Contract |
| Apr-19 | Rewa River Water Supply Project | River | Fiji | Infrastructure | Others | Contract |
| Aug-18 | Tari Airport Upgrade | Airport | PNG | Infrastructure | Transportation | U/C |
| Apr-18 | PNG Airport Expressway | Airport | PNG | Infrastructure | Transportation | Completed |
| Jul-16 | Port Moresby Sewage Treatment | Seaport | PNG | Infrastructure | Others | Contract |
| Total | 6 projects | | | | | |

Suggestions for strengthening co-operation within sub-regional expert networks for the shipping and port sector



Suggestions for strengthening co-operation within sub-regional expert networks for the shipping and port sector

➤ Vision and strategy for integrated maritime logistics system at sub-regional and national level

Overview and Analysis of Shipping and Port Sector in the Pacific

Global Trend

Current Situation, Problems, & Challenges in the Pacific

Vision and Strategy for “Integrated Maritime Logistics System” at Sub-regional and National level

1. To integrate a regional/national economy into the globalized economy : **Integrated transportation as driving force enabler**
2. To improve int'l trade competitive edge: **Lower doing business costs by improving maritime connectivity & efficiency**
3. To maximize impacts of the port investment and FTA on national & regional economy: **Logistics industry as growth engine**
4. To establish hub-and-spoke in association with logistics distribution center in the Pacific: **Optimizing transportation network**
5. To accommodate green factors for logistics and transport : **Green growth + sustainability growth**
6. To secure the regional economy from natural disasters, pandemic, & terrorist Attacks : **Building resilience strategy**
7. To develop “One Country” concept of the Pacific: **Value added and job creation**
8. To apply economies of flow, connexion, and fusion technologies* for maritime logistics (e.g., IMISP): **IT-based logistics and transportation platform**
9. To build up mechanism to train human power for maritime logistics and IT-based platform : **Training course & human power exchange program through the sub-regional cooperation**
10. To develop efficient governance system for maritime logistics industry: **Governing and collaboration between the Pacific and sub-regional bodies**

Establishing **Global Logistics Distribution Center (GLDC)** in the Pacific

➤ Proposed **Global LDCs** along New Maritime Silk Road



Source: Modified Figure 10 (a) and ((b) in Lee et al. (2022). Strategic locations for logistics distribution centers along the Belt and Road: Explorative analysis and research agenda, *Transport Policy*, 116, 24-47.

Good practices for sustainable maritime and port connectivity

“**Integrated Maritime Information System (IMIS)**”: A tailored-made for the Pacific

Information sharing among the stakeholders

- ✓ Platform among the Pacific Islands
- ✓ Optimize resources utilization
- ✓ Sharing cargo, ship, port,

IMIS: Software oriented project

- ✓ Applying **Fusion technology** (IoT, IT, BT, NT, AI, Blockchain, Soft & Cloud computing)
- ✓ Collaborating with sub-regional expert and research network.

Contributions:

- ✓ Low freight rates and logistics costs
- ✓ Port efficiency
- ✓ Job creation and value-added services
- ✓ Resilience to natural disasters & pandemic

Connecting **IMIS** to Global LDCs in the Pacific

- ✓ Hub-and-spoke system in the region
- ✓ Inventory control of warehouses in the Pacific

Link to sub-regional think-tanks & Experts

Response strategy to the aftermath of the COVID-19 with GLDC

- Disruption in **production lines** of manufacturing industries and in **supply chains** around the world
- Dismantled **services at ports**



*COVID-19 pandemic on transportation and trade were easily recognizable from a decrease in the **container cargo volumes***



The Pacific region is a small open economy in terms of international trade amounts

- Facing a **crisis** of unprecedented contraction in both **supply and demand**
- **Sea transport eco-system** is **not favorable** for the region



Response strategy

- ✓ Understand why such **expert evidence-based domain knowledge** matters and how collaboration
- ✓ **Co-operation at sub-regional and national levels** and confidence in scientific knowledge can help to establish confidence-building



Achievement

Successful responses to the short-, medium- and long-term impacts of the COVID-19 pandemic.

Thank You

Thank You

cảm ơn

Terima Kasih

Vinaka

ขอบคุณครับ / ขอบคุณค่ะ
ありがとうございます。

Muchas Gracias



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