

#### Transitioning to Low Carbon Shipping Module Sustainable Sea Transport Solutions for SIDS: Pacific Island Countries Case Studies

#### 2a. Sea Transport in the Context of Small Island Developing States

#### http://unctadsftportal.org/sftftoolkit/transitioningtolowcarbonshippingmodule/chapter2a/

#### Summary

The first part of the second chapter focuses on shipping in SIDS and examines how contextual challenges have been overcome in the past.

Key Themes: Pacific – SIDS – Transport – Sustainability – Past Experience

Facing a future whose only certainty is change, Small Island Developing States are confronted with many problems and difficulties in making progress towards sustainable development. The unique characteristics of Pacific shipping present a great challenge. Pacific leaders have noted that the development of sustainable sea transport would reduce the reliance on imported and expensive fuel and thus open up sea routes that today are considered unprofitable to service. But despite the identified need and the increasing availability of technology alternatives, meaningful measures to address this sector are proving slow to eventuate. However, small island societies have a record of thriving in challenging times. A historical legacy of innovation can provide a range of experiences to draw upon in looking towards sustainable options for the future.



### 2a. Sea Transport in the Context of Small Island Developing States

"Oceania is vast, Oceania is expanding, Oceania is hospitable and generous, Oceania is humanity rising from the depths of brine and regions of fire deeper still, Oceania is us. We are the sea, we are the ocean. We must wake up to this ancient truth..."

- Epeli Hau'ofa, We Are the Ocean: Selected Works

Small Island Developing States (SIDS) are amongst the smallest and most remote communities on earth. Facing a future whose only certainty is change, SIDS are confronted with many problems and difficulties - some intrinsic and timeless, others extrinsic and new - in making progress towards sustainable living and sustainable development. However, small island societies have a record of thriving in challenging times. Their long histories are rooted in new and innovative approaches, societal mobilization and technological adaptation. SIDS remain a special case for sustainable development in view of their unique and particular vulnerabilities and because they remain constrained in meeting their goals in all three dimensions of sustainable development (economic, social and environmental). They share a commonality in that they are all situated in an ocean environment. Their countries are entirely bounded by the sea. They are maritime peoples.

Sea transport is the lifeline of SIDS, moving the vast majority of people, goods and resources. It is crucial for trade and economic development and impacts upon virtually every sustainability initiative. For the countries and communities of Oceania, sea transport is arguably more critical for connectivity than for any other society. Yet for many, existing maritime transport services are increasingly unaffordable and unsustainable. The irregularity of domestic inter-island shipping services has a negative impact on the production and income generation potential of islands, as regular access to markets is crucial to planning production cycles and establishing reliable distribution mechanisms.

Consequently, these islands are faced with a circular problem, where the lack of adequate shipping services limits the ability of islanders to generate the income sufficient to pay for the shipping services.

In the case of the Pacific Islands Countries (PICs) the region's transport issues are unique; small and vulnerable economies scattered at the ends of some of the longest transportation routes in the world and arguably the most challenging to maintain per capita and per sea mile. Sea transport, especially at the domestic level, has always presented a difficult issue for PICs to find long-term, sustainable, and cost-viable solutions for, even in periods of low fuel costs. The unique characteristics of Pacific shipping (minute and narrow economies at the end of long routes, imbalance in inward/outward loadings, financing barriers, high

The following images are selected from "Appendix D: Chapter 2a."

Please refer to this appendix for full size images and sources.



The Pacific region.



Expenditure on international transport as a percentage of the value of all imports.



Typical vessels in Fiji waters.

operational risk, high infrastructural costs) present a greater challenge than for most other countries and regions. Their sea transport picture bears little resemblance to the international scenario sketched in chapter 1.

All current options are fossil fuel powered. Imported fuel prices and the demand for global emissions reduction will continue to rise in the long-term. The PICs are the most imported fossil fuel dependent region in the world with (95% dependency, 99% if Papua New Guinea and Fiji are excluded). Transport uses some 70% of the total fuel imported regionally. Of this sea transport is a majority (and in some countries the majority) fuel user. Tuvalu, for example, reported that 38% of total fuel imports or 64% of all transport fuel in 2012 was for maritime use or ~38% of total fuel imports. For Tokelau it is ~80% of all fuel used.

Many maritime services are increasingly unaffordable. Shore-side infrastructure is regularly in poor repair, expensive, difficult to maintain and highly vulnerable to extreme weather events. Ships are often old, poorly maintained and inefficient. Fossil fuels represent a significant proportion of shipping operating costs, often the largest single cost. There is often insufficient throughput to economically justify higher quality standards. Accessing asset and operational finances and insurance is difficult and not cost effective. This results in a vicious cycle of old ships being replaced with old ships, and the need for larger ships to achieve economies of scale. When combined with narrow reef passages, small harbours and small cargos and passengers' loadings, this leads to many routes being commercially marginal or even unviable.

Governments are often required to subsidise such routes. Even then, there is often insufficient private sector capacity or willingness to provide the services in which case the governments are then required to service these routes, often lacking themselves the capacity to do so or leave such communities without access to regular or adequate transport. This negative expenditure cycle is then exacerbated in periods of disaster such as droughts or cyclones. The net result is decreased government budgets for other forms of socio-economic servicing, increased dependency of the margins and hollowed populations as communities increasingly migrate to urban centres.

Most PICs *lack access to current and reliable transport data* and information needed for effective planning and decision-making. There is an acute lack of specialized transport planning capacity or training and what does exist is largely targeted at the land transport sector. Despite its critical role for SIDS, preparation and investment in capacity for transitioning to low carbon transport futures has until now being consigned to the "too-hard basket" and largely ignored. A sea change is required. Sea transport is integral and essential to almost all sustainability and development agendas for SIDS.



Selected Caribbean SIDS.



Selected Indian Ocean SIDS.



Selected Pacific Ocean SIDS.

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But despite the identified need and the increasing availability of technology alternatives, meaningful measures to address this sector are proving slow to eventuate. Low carbon sea transport solutions and transition strategies have been almost invisible in the policy space at national, regional and particularly donor levels across the Pacific region. The focus across the region to reduce fuel dependency to date has been almost exclusively on electricity generation. The regional renewable energy discourse has become largely synonymous with electricity, reflecting global perceptions and development agency bias but not necessarily Pacific realities or priorities. Commitment of more than USD 535 million targeted at diesel dependency reduction by global donors at the Pacific Energy Summit in Auckland in 2013 and a subsequent commitment of USD 228 million by the Asian Development Bank (ADB) in 2014 was confined almost exclusively to electricity programmes with no projects directed specifically at sea transport.

While all PICs have set targets, many extremely ambitious, for reducing fuel dependency for electricity generation, only the Marshall Islands and Fiji have so far set national targets for the transport sector (20% reduction in transport fuels by 2020). There is no regional programme to include transport emissions in individual INDCs (Indicative Nationally Determined Commitment) prior to COP21 as there has been for electricity generated emissions. This is illogical and irrational given the obvious need for and priority of this sector and we discuss the barriers and challenges this poses in chapter 5.

There are some welcome signs that this policy situation is beginning to change.

The **Pacific Islands Development Forum** (PIDF) was the first regional agency to highlight the need for sustainable transport transition and listed it as one of 10 top priorities for the region. In their communiqué at their inaugural meeting in August 2013, Pacific leaders noted that the development of sustainable sea transport would reduce the reliance on imported and expensive fuel and thus open up sea routes that today are considered unprofitable to service. PIDF prioritizes transition to Blue/Green Economies as the future development direction for the Pacific and notes these are predicated on the region adopting a transition from current extreme dependency on imported fossil fuels to innovative low carbon technologies:

"Prioritise alternatives to existing petroleum driven land and sea transportation that significantly reduce fuel imports. Sustainable sea transport approaches are to be promoted and adopted as an alternative to provide effective services for remote island communities."

At the United Nations Sustainable Development Summit on 25<sup>th</sup> September 2015, more than 150 world leaders adopted the new 2030 Agenda for Sustainable Development, including 17 Sustainable Development Goals (SDGs). While no SDG is explicitly



Pacific hub ports and international shipping routes.

Suva, Fiji – the Main Pacific Transhipment Port



Suva, Fiji – the main Pacific transhipment port.



Small ports, old wharves, narrow reef passages are common.

Infrastructure often poorly maintained and vulnerable to extreme weather events



Infrastructure often poorly maintained and vulnerable to extreme weather events.

dedicated to transport, the fact that transport-related targets are included directly in various SDGs (for example in Goal 7 on energy efficiency, Goal 9 on sustainable and resilient transport infrastructure, Goal 11 on sustainable urban transport, and Goal 12 on fuel subsidies), as well as indirectly for other SDGs targets (relating among others to food security, access to water, air pollution, climate change and the global partnerships) establishes the cross cutting role of transport in supporting a sustainable development path.

The UN hosted the **Third International Conference on Small Island Developing States** in Samoa in September 2014. The resultant S.A.M.O.A. Pathway outcome statement includes specific reference to sustainable transport as per the following text:

#### Sustainable transportation

- 66. We recognize that transportation and mobility are central to the sustainable development of small island developing States. Sustainable transportation can enhance economic growth, promote trade opportunities and improve accessibility. Sustainable, reliable and safe transportation achieves better integration of the economy while respecting the environment. We also recognize the importance of the efficient movement of people and goods in fostering full engagement in local, regional and global markets and the potential for sustainable transportation to improve social equity, health, the resilience of cities, urban-rural linkages and the productivity of rural areas of small island developing States.
- 67. In this regard, we are committed to continuing and enhancing support for the efforts of small island developing States:
  - (a) To gain access to environmentally sound, safe, affordable and well-maintained transportation;
  - (b) To advance the safety of land, sea and air transportation;
  - (c) To develop viable national, regional and international transportation arrangements, including improved air, land and sea transport policies that take a life-cycle approach to the development and management of transport infrastructure;
  - (d) To increase energy efficiency in the transport sector.

This high-level policy commitment now needs to be followed by concrete action. But this is proving slow to arrive for SIDS and PICs in particular. The ADB is the region's traditional primary source of infrastructure financing. Transport is one of the main sectors that ADB supports, a reflection of the important role that transport plays in enabling economic development and poverty reduction. Transport has accounted for 21% of ADB lending since it was established in 1966, and 27% during 2005–2009. Within the

2010–2012 lending pipeline, projected transport lending was USD 3.4 billion per year.

Despite adopting sustainable transport as the guiding principle for aligning its transport operations with its Strategy 2020, resourcing Pacific countries transition in sea transport is not identified or provided for. Emphasis is almost entirely on urban and land transport solutions and maritime support for PICs is restricted almost exclusively to infrastructural loans for wharves. The remainder of the industry and shipping asset in particular is often the sole preserve of the private sector. This paradigm is echoed by most regional and bilateral donors to date, even though it ignores the economic reality of the sector when situated within a SDIS context.

So what can be done in a practical sense to achieve a target of transitioning SIDS to low carbon sea transport options? In subsequent chapters of this module we look at the evidence from past trials in the Pacific, examine initiatives from around the world in renewable energy technologies for shipping and explore other methods of increasing energy efficiency for this sector. As we discuss in chapter 5, availability of technology is not the major constraint to progressing this agenda but the more subtle and complex barriers of perception, policy and financing.

#### Disclaimer

This module has been prepared for UNCTAD by Peter Nuttall and Alison Newell of the Pacific Centre for Environment and Sustainable Development, the University of the South Pacific. While every effort is made to ensure the accuracy and completeness of the module, UNCTAD assumes no responsibility for eventual errors or omissions. The content and views expressed are those of the authors and do not purport to represent any organisation.

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# **Chapter 2a**

# Sea Transport in the Context of Small Island Developing States

# **The SIDS Shipping Context**

- SIDS are amongst the smallest and most remote communities on earth. They
  face a future whose only certainty is change. Their long histories are rooted in
  new and innovative approaches, societal mobilization and technological
  adaptation.
- SIDS have unique and particular vulnerabilities. They remain constrained in meeting their goals in all three dimensions of sustainable development.
- SIDS are diverse in many aspects, including in geographical location and respective levels of development. SIDS share a commonality in that they are all situated in an ocean environment. Their countries are entirely bounded by the sea. They are maritime peoples.
- Many SIDS are amongst the most vulnerable countries in terms of exposure to natural hazards and foreseeable impacts of climate change.
- Sea transport is the lifeline of SIDS, moving the vast majority of people, goods and resources. Having no land borders, sea transport is more critical for these societies. It is crucial for trade and economic development and impacts upon virtually every sustainability initiative.

# **The SIDS Shipping Context**

- For many SIDS, existing maritime transport services are increasingly unaffordable and unsustainable. They share commonalities including geographic remoteness from their main trade partners, limited volumes of trade, trade imbalances stemming from a heavy reliance on imports, and low volumes of exports highly concentrated in a few products.
- SIDS generally lie outside the major East–West maritime trade routes and a long way from major ports.
- Many SIDS are faced with a circular problem, where the lack of adequate shipping services limits the ability of islanders to generate the income sufficient to pay for shipping services.
  - The irregularity of domestic inter-island shipping services has a negative impact on production and income generation potential. Regular access to markets is crucial to planning production cycles and establishing reliable distribution mechanisms.
  - At an inter-country level inadequate transport contributes to constrained/poorly developed intra-regional trade networks.

Expenditure on international transport as a percentage of the value of all imports, average 2004-2013



Source: UNCTAD estimates.

Source: UNCTAD, 2014

## **Determinants of SIDS Freight Costs**

- Economies of Scale Low volumes of trade = higher freight costs. Smaller vessels are less fuel efficient per unit carried, smaller ports = higher operating costs per tonne of cargo, infrastructure takes longer to pay off for smaller volumes of business.
- Trade Imbalances Most SIDS are net importers with huge trade imbalances. Most SIDS import freight costs are higher than export freight costs.
- **Distance** Location away from main shipping routes/markets is a major challenge, in particular for SIDS in the Indian and Pacific Oceans. Caribbean SIDS are closer to the North American market, and benefit from lying relatively close to the main shipping routes that make use of the Panama Canal.
- **Competition** Small markets, narrow economies, small cargo sizes limit competition for service.
- Port Characteristics Shipping costs also depend on port efficiency. SIDS' infrastructure tends to be old, in poor condition and lacks modern equipment. Long waiting times for ships leads to higher maritime freight costs.

Container Ship Deployment for Selected Island Economies, May 2014

Country	Number of Ships	TEU carrying capacity	Largest ship (TEU)	Number of companies	Number of sercies
Antigua and Barbuda	11	6880	1250	3	6
Bahamas	44	271936	9178	4	10
Barbados	15	10504	1250	6	9
Cape Verde	4	4027	1325	3	5
Comoros	11	16219	2210	3	16
Dominica	5	1494	430	2	3
Dominican Republic	122	397375	6750	21	55
Fiji	23	42993	2758	8	18
Grenada	10	6182	1284	5	6
Haiti	16	13582	1296	7	. 11
Iceland	9	8099	1457	2	6
Jamaica	109	355837	6750	15	41
Kiribati	4	3760	970	1	7
Maldives	5	12871	2764	3	2
Marshall Islands	7	4997	970	1	9
Mauritius	40	124005	6712	7	12
Micronesia, Federated States of	3	1237	418	1	1
Palau	3	1237	418	1	1
Papua New Guinea	29	34646	2546	8	21
Saint Kitts and Nevis	5	2864	660	3	3
Saint Lucia	14	10188	1284	5	7
Saint Vincent and the Grenadines	9	4988	1122	4	6
Samoa	7	7229	1304	4	11
Sao Tome and Principe	5	6757	2169	2	2
Seychelles	10	21723	2764	3	8
Solomon Islands	22	25165	2082	6	3
Tonga	6	5049	1043	3	12
Trinidad and Tobago	52	110424	5089	13	25
Vanuatu	11	12143	2082	4	8
American Samoa	7	7229	1304	4	11
Aruba	7	8676	2008	4	7
Bermuda	3	1002	362	3	2
Cayman Islands	3	798	340	1	1
Curaçao	9	13229	2546	6	11
Faeroe Islands	3	3425	1457	2	2
French Polynesia	19	45779	3820	8	17
Guam	15	24804	2781	4	8
New Caledonia	26	48917	2758	7	24
Average rest of the World	166	749001	7076	20	90

#### Liner Shipping Connectivity Index, Selected Caribbean SIDS



#### Liner Shipping Connectivity Index, Selected Indian Ocean SIDS



#### Liner Shipping Connectivity Index, Selected Pacific Ocean SIDS



## **The Pacific Region**



Around **10 million** people and 25,000 islands scattered across **3** million square miles of the Pacific Ocean, the Pacific region is arguably the most dependent on sea transport in the world.

Pitcaim Is.

Easter Is.

# **Shipping in the Pacific**

#### International

- 60 international ports in the Pacific.
- Approximately 18 private shipping lines servicing Pacific Island Countries
  - Routes transit between France (mainly territories of New Caledonia and French Polynesia), East Asia (Japan, Taiwan, China, Singapore), Australia, New Zealand, US (including Guam and Hawaii).
  - Regularity varies from 1 week to 2 months depending on company and route

#### Regional

- Approximately 80 shipping companies operating in Pacific countries.
- 9 Pacific governments operate shipping lines: Fiji, FSM, Kiribati, Palau, RMI, Samoa, Tokelau, Tonga, and Tuvalu.
- Within most PICs the main or larger island(s) act as hub for smaller islands.
- Local shipping companies often family, church, island community owned/operated local crews may not have formal training.
- Inter-island ships tend to be donor given or purchased 2<sup>nd</sup> hand. Range in age from new to 50+ years.
- Maintenance suffers due to low profit margins and inability to locally source supplies/technical capacity.

## **Pacific Island Countries Shipping Context**

- In the case of the PICs, the region's transport issues are unique: small and vulnerable economies scattered at the ends of some of the longest transportation routes in the world and arguably the most challenging to maintain per capita and per sea mile.
- Sea transport, especially at the domestic level, has always presented a difficult issue for PICs to find long-term, sustainable, and cost-viable solutions for, even in periods of low fuel costs.
- These factors often result in governments having to subsidise private operators or service these routes themselves, at a cost to provision of other critical service delivery.
- PICs are the most imported fossil fuel dependent region in the world (99% dependency). Transport uses some 70% of the total fuel imported regionally. Of this sea transport is a major (and in some countries the majority) fuel user. Tuvalu, for example, reported that 38% of total fuel imports or 64% of all transport fuel in 2012 was for maritime use. For Tokelau it is ~80% of all fuel used.

## **Pacific Island Countries Shipping Context**

- Many maritime services are increasingly unaffordable. Shore-side infrastructure is regularly in poor repair, expensive, difficult to maintain and highly vulnerable to extreme weather events. Most was built in the 1950s and 60s and has not been modernised since.
- Ships are often old, poorly maintained and inefficient. Fossil fuels represent a significant proportion of shipping operating costs, often the largest single cost.
- There is often insufficient throughput to economically justify higher quality standards. Accessing asset and operational finances and insurance is difficult and costly. This results in a vicious cycle of old ships being replaced with old ships, and the need for larger ships to achieve economies of scale.
- Inadequate and unreliable transport is a major contributing factor to migration from outer island margins to urban centres. Women, the old and the young are the most disadvantaged.
- Most PICs lack access to current and reliable transport data and information needed for effective planning and decision-making. There is an acute lack of specialized transport planning capacity or training.





In September 2015, world leaders adopted the 2030 Agenda for Sustainable Development including 17 Sustainable Development Goals.

Maritime transport was noted as being of particular relevance to:







Goal 2: Zero hunger.



Goal 7: Affordable and clean energy







Goal 9: Industry, innovation, infrastructure



**Goal 10: Reduced inequalities.** 



Goal 11: Sustainable cities and communities.



Goal 12: Responsible consumption, production.



**Goal 13: Climate action** 



Goal 14: Life below water

Source: http://www.un.org/sustainabledevelopment/summit

## **Links between Constraints and Consequences**



# **Pacific Island Countries Shipping Constraints**

There are various compounding factors which affect Pacific SIDS making sustainable, cost-viable sea transport particularly challenging, including:

- minute narrow economies with high imbalance of import/export loadings
- extreme dependency on imported fossil fuels
- often long distances and small loads (all PICs except PNG are net importers)
- lack of adequate shore-side infrastructure
- high risk environments (e.g. tropical cyclone prone, reefs)
- narrow/constrained channels and passages, often poor navigational markers/aids
- lack of commercial shipping service providers willing to service "uneconomic" routes
- focus of existing aid/development initiatives on the shore-side facilities and not on the vessels themselves (which is usually seen as the preserve of the private sector)
- many economies too small to justify private sector investment

#### **Pacific Hub Ports and International Shipping Routes**



Source: Secretariat of the Pacific Community

# **Typical Vessels in Fiji Waters**



### Suva, Fiji – the Main Pacific Transhipment Port



# Small ports, old wharves, narrow reef passages are common



# Infrastructure often poorly maintained and vulnerable to extreme weather events



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