



# 6

## MARITIME TRANSPORT IN SMALL ISLAND DEVELOPING STATES

*Small island developing States are small in area, in population and in economy. Smallness is a factor of vulnerability in different ways. It very often implies a small domestic market and a narrow resource base for export opportunities, with limited agricultural or mineral production or manufactures, leading to a high share of imports in GDP. Transport costs of SIDS trade are comparatively high because small volumes of trade have to travel long and indirect routes to reach distant markets. As open and small economies, SIDS are also vulnerable to global economic and financial shocks. Furthermore, most SIDS are vulnerable to natural hazards, because they are located unfavourably in relation to global weather systems and in areas prone to strong weather events, including those associated with the foreseeable impacts of climate change.*

*This chapter highlights some of the related obstacles faced by transport services connecting SIDS to global markets, such as costs and connectivity issues, as well as disruptive weather-related events affecting the reliability of transport and logistics services.*

*Contributions made by experts at a recent ad hoc expert meeting organized by UNCTAD are also reflected in the final part of the chapter. These include new approaches to address the unique transport-related challenges facing SIDS and suggestions on the way forward with some concrete actionable recommendations. Proposed actions and measures of particular relevance are regrouped in three main interlinked categories: SIDS transport and trade logistics-related challenges; climate-change impacts and adaptation for transport infrastructure; and financing sustainable and resilient transport systems in SIDS.*

## A. INTRODUCTION

Small island developing States regroup a collection of countries that are diverse in many aspects, including in terms of their geographical location and respective levels of development.<sup>115</sup> They have in common to be small in land and population, to be sea locked, to be developing countries, and to be independent States.

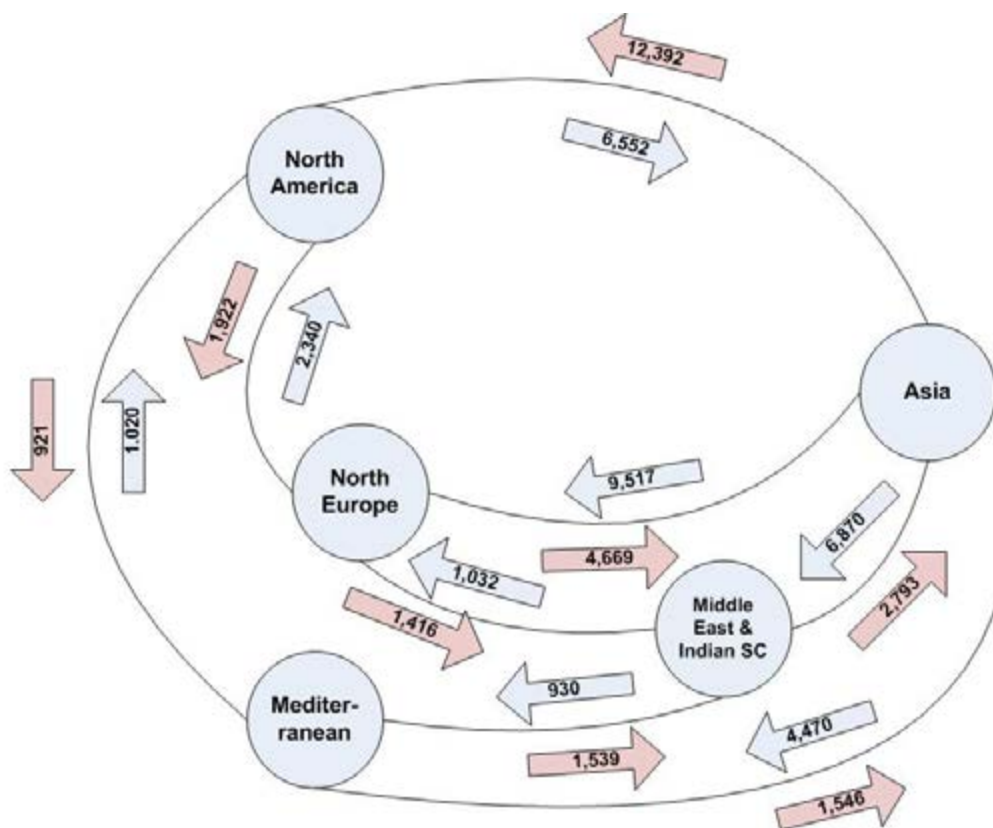
Despite some differences in the profile, structure and flows of their trade, SIDS share a number of common features from an international transport perspective: geographic remoteness from their main trade partners; limited volumes of trade; trade imbalances stemming from a heavy reliance on imports; and low volumes of exports highly concentrated in a few products. For many of them, their vast territorial waters add to the difficulty and complexities of their domestic inter-island transport systems.

As highly open economies, most SIDS are particularly dependent on their foreign trade and suffer from a strong exposure to external variations, including global or regional financial and economic crises. Also, due to their geographical location in areas of strong weather and seismic events, many SIDS find themselves amongst the most vulnerable territories in terms of exposure to natural hazards and foreseeable impacts of climate change. Both economic and environmental risks have significant bearings on their transport systems in terms of reliability and costly operation.

## B. REMOTENESS FROM GLOBAL SHIPPING NETWORKS

Remoteness from the main global trade routes constitutes a major disadvantage in terms of cost

Figure 6.1. Interregional container flows, 2011 (Thousands of TEUs)



Source: UNCTAD secretariat, based on data provided by *Lloyd's List Containerisation International*, various issues.

and time to access international markets. Spread across different regions, SIDS, grouped here as the Caribbean, the Indian Ocean, the West African and the Pacific regions, lie outside the major East–West maritime trade routes. These routes connect the three economic regions of Asia (Far East, Western Asia and South Asia), Europe (Northern Europe and the Mediterranean) and North America (figures 6.1 and 6.2). Many SIDS, which are highly dependent on containerized imports, are nevertheless in no position to share in the gains that may be generated along a maritime belt or a corridor carrying around 85 per cent of global containerized trade flows exclusively through the northern hemisphere, and which excludes countries located in the southern hemisphere.

Figure 6.2 shows that at no time does the belt or corridor enter the southern hemisphere where many SIDS are located; when it crosses the Pacific and Atlantic Oceans it reaches relatively high northerly latitudes.

While SIDS are not at the centre stage of these East–West trade patterns, it is, however, this same belt of shipping services that determines the maritime transport connectivity and costs of SIDS. They may in a way benefit from container service operators' strategies such as hub-and-spoke feeding, interlining and relay services, with hub-and-spoke being the most prevalent.<sup>116</sup> The hub-and-spoke strategy, in particular, has led to the emergence of a number of regions where feeder ships carry containers to and from larger hub ports. The main trading regions include North Europe, the

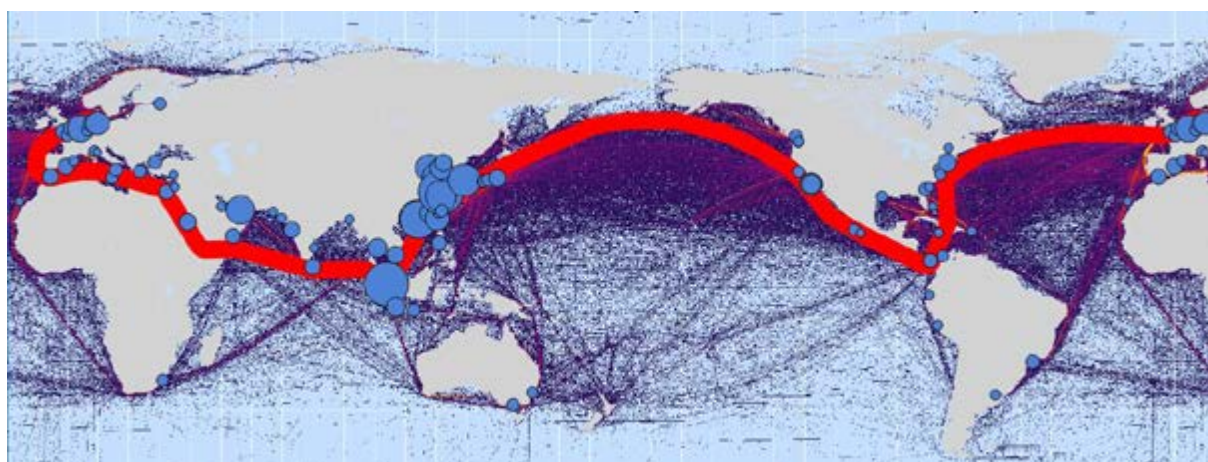
Mediterranean, Western and South Asia, South-East Asia, Central-East Asia, North-East Asia and the Caribbean.

The relay strategy is most often used to connect the East–West services on the belt to North–South services to Africa, Australia and South America. The principal ports acting as relay ports are Algeiras, Tanger Med and Las Palmas at the eastern end of the Mediterranean (for South America and West and South Africa); Gioia Tauro (for the Indian Ocean islands and Australia); Salalah (for East and South Africa as well as the Indian Ocean islands); Singapore (for Africa, South America, Australia and the Pacific islands); Hong Kong (China) and Kaohsiung (for the Philippines and the northern Pacific islands); Busan (for the Pacific islands); and Manzanillo and Lazaro Cardenas (Mexico), Panama (East and West Coast), Kingston (Jamaica) and Freeport (Bahamas) (for South America).

### C. SHIPPING SERVICES OF SMALL ISLAND DEVELOPING STATES

Each regional group of SIDS keeps different spatial links with the main East–West container flows. The Caribbean SIDS are advantaged by their location at the cross point between the East–West routes, while SIDS in the Pacific and Indian Oceans are located outside the belt. In the Indian Ocean, Mauritius is relatively better positioned as it is located at the crossroads between the Asia–Africa/South America route and the Europe–Australia route. The Pacific

**Figure 6.2. Main East–West shipping route and location of largest container ports**



Source: UNCTAD secretariat, based on port traffic data from UNCTAD *Review of Maritime Transport*, various issues, and a map from [http://bioval.jrc.ec.europa.eu/products/gam/images/large/shipping\\_laness.png](http://bioval.jrc.ec.europa.eu/products/gam/images/large/shipping_laness.png) (accessed 6 October 2014).

islands are remote from the East–West belt. The West African island of Cape Verde is relatively close to Las Palmas, a Global trans-shipment port, while Sao Tome and Principe is off the beaten track.

Consequently, in addition to any prevailing economic differences, variations in their geographical positions and relative distance from the main East–West containerized maritime routes should be borne in mind when addressing transport and trade logistics challenges of SIDS.

## 1. Caribbean

As the global East–West belt passes through the middle of the Caribbean, SIDS in the region benefit from a relative geographical advantage. Additionally, proximity to the United States means that they can take advantage of that country's cabotage laws, container inspection and security regulations and readiness of their ports to accept Post-panamax container vessels.

Services to or through the Caribbean are provided by global operators (CMA-CGM, Maersk and MSC) or their brand names<sup>117</sup> as well as the G6 Alliance (Hapag-Lloyd, NYK Line, OOCL, Hyundai Merchant Marine, APL and Mitsui O.S.K. Lines) or their members individually.

The trans-shipment/relay status of Freeport-Bahamas, Kingston and Port of Spain is reflected in that they have the largest number of direct connections with countries outside the Caribbean. Thus, unless containers are coming from or going to France, Guyana, Jamaica, Suriname, Trinidad and Tobago, the United Kingdom or the United States, they will need to be trans-shipped at one of those ports (and possibly elsewhere as required by the trade).

## 2. Indian Ocean islands

Apart from Maldives, and while outside the global East–West mainlanes, Indian Ocean SIDS<sup>118</sup> are nevertheless located on, or close to, a number of North–South routes including: Europe to Australia; East Asia to East Africa; East Asia to South Africa; East Asia to West Africa as well as East Asia to the East Coast of South America. At the same time, these islands are at the intersection between the North–South route linking South and East Africa to Western Asia and South Asia.

Current shipping services include (a) SIDS in the Indian Ocean connecting to Asia (North, Central-East, and

South-East Asia), (b) the Mediterranean and Australia, (c) North–South services between South and East Africa (including the Indian Ocean islands) to Western Asia and South Asia, and (d) feeder services linking SIDS within the Indian Ocean area.

## 3. Pacific

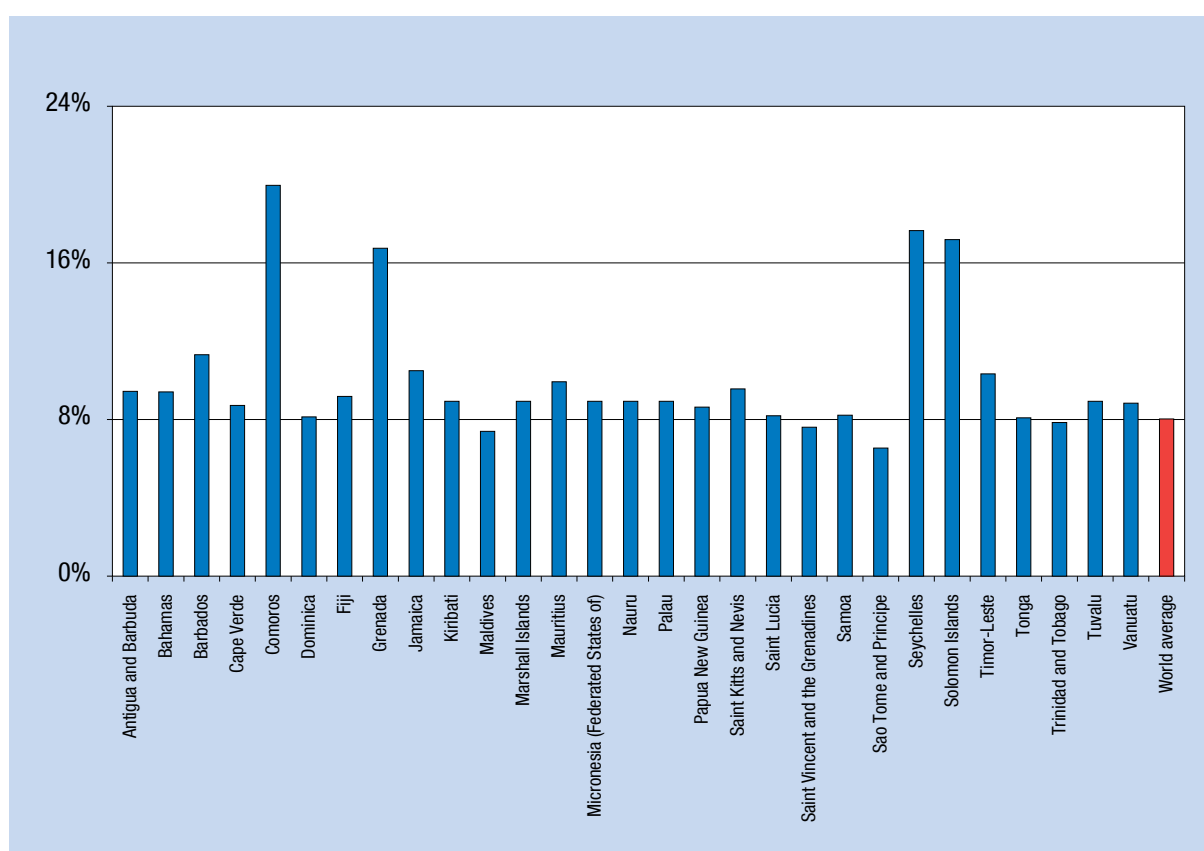
The Pacific SIDS are not located on the global East–West belt; they are served, directly or indirectly, through the global feeder/relay ports of Singapore, Hong Kong (China)/Kaohsiung and Busan. They are also served, directly or indirectly, from or through Australia and New Zealand. In addition, there are services from the West Coast of North America to the islands in the North Pacific, a West Coast of North America to Australia and New Zealand service that calls at one South Pacific island on the southbound leg of its voyage, and a Pacific North–West service to Australia that calls at one South Pacific island on the northbound leg of its voyage. There are no direct services between SIDS in the Pacific and Europe.

## 4. West Africa

In West Africa, Sao Tome and Principe is not located on the global East–West belt. Neither is Cape Verde, although it is better positioned in relation to a number of global hubs, including Las Palmas and Tanger Med in Morocco.

Sao Tome and Principe is mainly serviced out of Portugal, while Cape Verde is serviced out of Las Palmas and Tanger Med as well as Portugal. Connections to the rest of the world for both countries use trans-shipment ports. In broad terms, Cape Verde and Sao Tome and Principe are only connected to some countries in Europe and West Africa. In the case of both countries, African connections tend to be with neighbouring countries on the African mainland. Hence, Cape Verde is connected to the Gambia, Guinea, Guinea-Bissau, Mauritania and Morocco, while Sao Tome and Principe is connected to Angola, Cameroon, Equatorial Guinea, Gabon and Nigeria.

For both countries, from outside the continent their ports are called at before liner services call at the ports of other African countries, and in both cases, reduced trade volumes are registered with neighbouring countries – especially in the case Sao Tome and Principe.

**Figure 6.3. Expenditures on international transport as a percentage of the value of imports, average 2004–2013**

Source: UNCTAD estimates.

## D. TRANSPORT COSTS IN SMALL ISLAND DEVELOPING STATES

### 1. Data on international transport costs in small island developing States

Empirically, most SIDS pay higher freight costs for the transport of their imports than the world average. Figure 6.3 provides UNCTAD estimates for the 10-year average of selected SIDS expenditures on international transport costs as a share of the value of their imports (2004–2013 average). The average SIDS have paid 2 per cent more than the world average of 8.1 per cent during the period. The highest values are estimated for the Comoros (20.2 per cent), followed by Seychelles (17.9 per cent), Solomon Islands (17.4 per cent) and Grenada (17.0 per cent).

### 2. Determinants of small island developing States freight costs

Empirically, determinants of international transport costs can be grouped into six main categories (UNCTAD, 2012; Micco et al., 2003; Sourdin, 2012; UNCTAD, 2008), notably economies of scale, trade imbalances, the type and value of the traded goods, geographical distance, the level of competition among transport service providers, and the characteristics of the sea- and airports as regards their infrastructure, operation and management. These different determinants are linked to each other; low trade volumes, for example, may lead to diseconomies of scale and at the same time also reduce the level of competition. The impact of each determinant may vary over time; for example, if the price of fuel increases, the impact of a longer distance on freight costs will be felt stronger.

The following section discusses the situation of SIDS as regards these determinants on maritime transport, the most relevant mode for overseas trade of SIDS.

### ***Economies of scale***

Lower volumes of trade will empirically lead to higher freight costs. Smaller vessels are less fuel efficient per unit carried, smaller ports have higher operating costs per ton of cargo, and investments in infrastructure take longer to pay off for smaller volumes of business. Some SIDS have successfully managed to become attractive trans-shipment centres. Ports in Bahamas, Jamaica and Mauritius, for example, are providing trans-shipment services to container lines. Concentrating cargo in their country made it economically viable for larger container ships to call at these countries' ports, while the ports invested in necessary dredging and container-handling equipment.

### ***Trade imbalances***

If ships are not fully loaded on the export leg because the country has a merchandise trade deficit, the importer will de facto also have to pay for the return journey of the empty vessel or container. Most SIDS are confronted with huge trade imbalances, and consequently for most SIDS import freight costs are higher than export freights.

To reduce imbalances, traders may aim at broadening the regional cargo base. One country's surplus in a given commodity can be combined with another country's deficit, so that on average the trade with overseas trading partners becomes more balanced. Spare export capacity and lower export freight rates for containerized trade can be seen as an opportunity even for cargo not commonly containerized to be exported via liner shipping services.

### ***Distance***

A location away from main shipping routes and overseas markets is a major challenge in particular for SIDS in the Indian Ocean and in the Pacific. Caribbean SIDS are closer to the North American market, and benefit from lying relatively close to the main East–West and North–South shipping routes that make use of the Panama Canal. But, in general, if fuel costs rise, and if recent trends in liner shipping networks and fleet deployment continue, the geographical disadvantage for SIDS may in fact worsen. Closer markets would become a better option.

### ***Competition***

As ship sizes increase and shipping companies and networks grow in size, carriers require ever more cargo to maintain a commercially viable service. As discussed in chapter 2 (see figures 2.6 and 2.7), the average container carrying capacity per company or per service continues to grow. Opening up national or regional cabotage markets allowing international liner companies and regional carriers to combine international and national traffic may provide shippers with alternative options and higher frequencies. It may also help carriers to reduce the number of empty returns. As long as some level of competition exists, some of these cost savings will be passed on to the client through lower freight costs.

### ***Port characteristics***

The costs of shipping depend also on the efficiency of the ports of call. Seaports need to be dredged to accommodate ever larger ships, and to have their own ship-to-shore container cranes, given that ever fewer new vessels are today built with their own gear (see also figure 2.3). Long waiting times for ships, or lengthy customs clearance procedures also empirically lead to higher maritime freight costs.

## **E. LINER SHIPPING CONNECTIVITY**

### **1. Data on liner shipping connectivity in small island developing States**

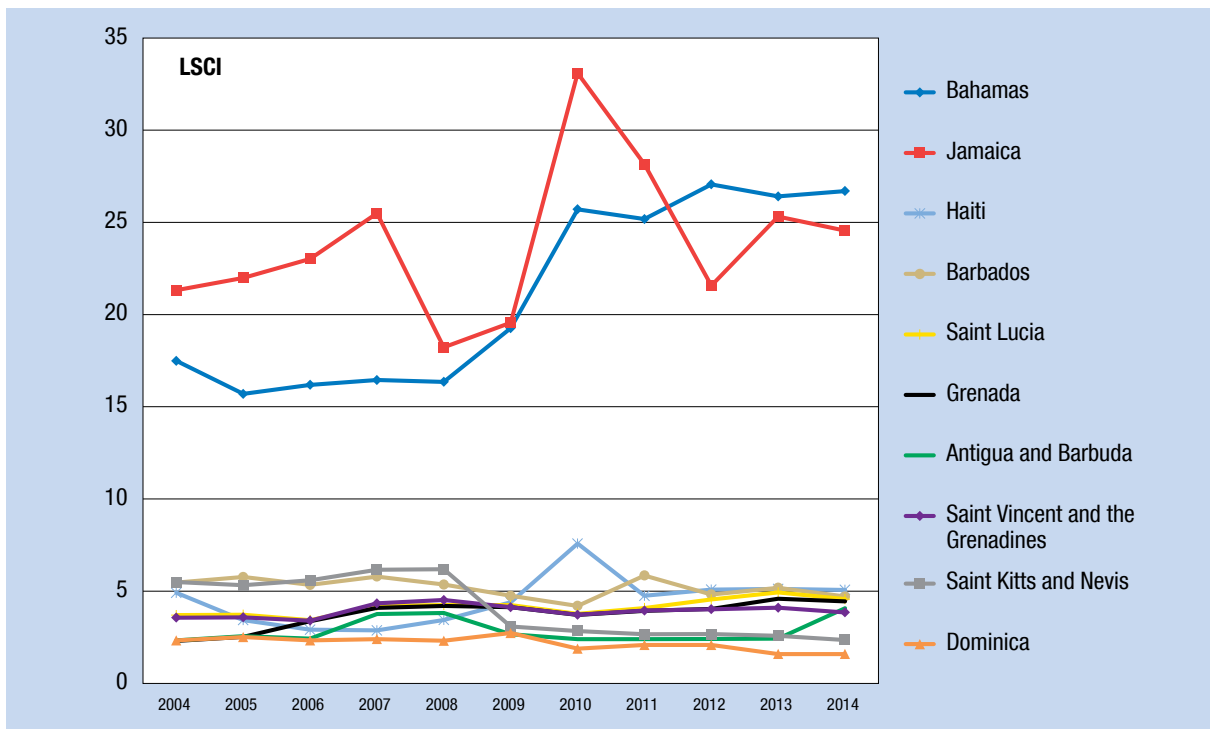
A country's participation in global trade also depends on its effective access to frequent and reliable transport services, that is, its shipping connectivity. The available data suggest that SIDS are confronted with serious challenges concerning their connectivity.

From the 2014 UNCTAD LSCI, it can be seen that most SIDS are among the least-connected economies covered by the index (UNCTADstat, 2014). Looking in more detail at the components from which the LSCI is generated (table 6), it can be seen that practically all SIDS are served by fewer container shipping companies, providing fewer services, with fewer and smaller ships than the world average. As regards vessel sizes, for example, several SIDS accommodate ships with less than 1,000 TEUs of container carrying capacity, far below the 7,076-TEU average for the rest of the

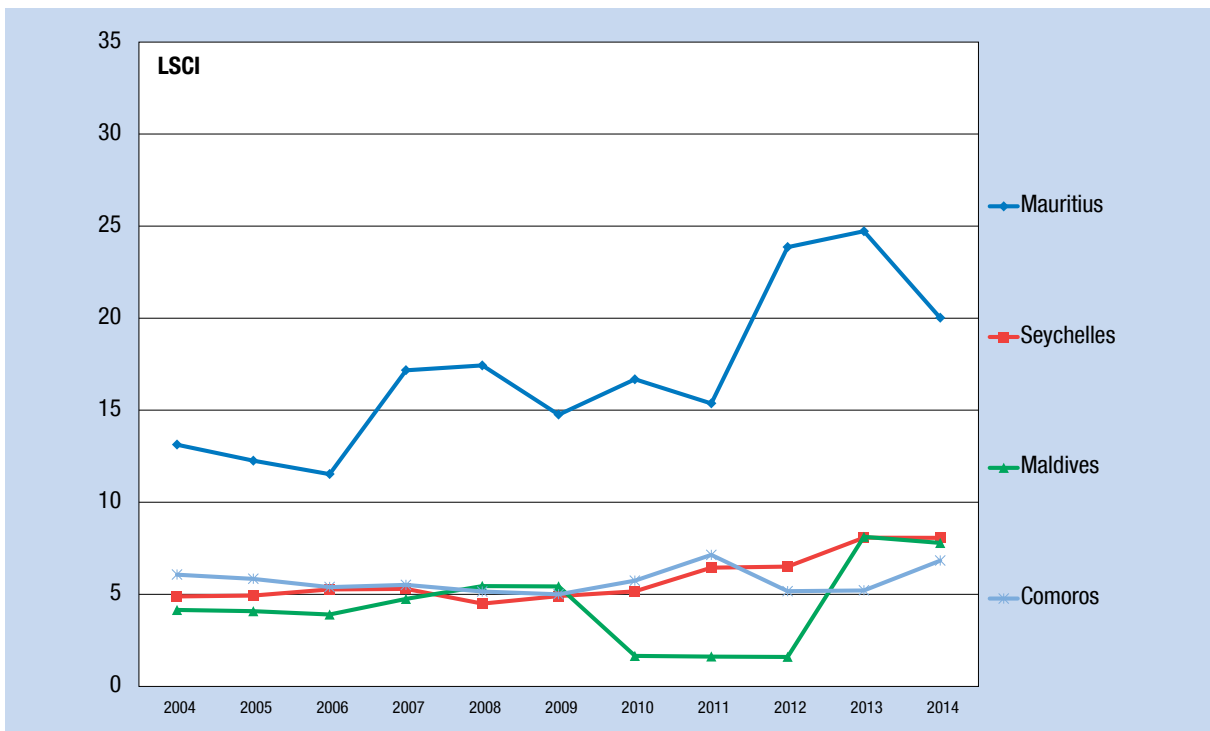
**Table 6. Container-ship fleet deployment for selected island economies, May 2014**

| Country                          | Number of Ships | TEU carrying capacity | Largest ship (TEU) | Number of companies | Number of services |
|----------------------------------|-----------------|-----------------------|--------------------|---------------------|--------------------|
| 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                 |

Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by Lloyds List Intelligence.

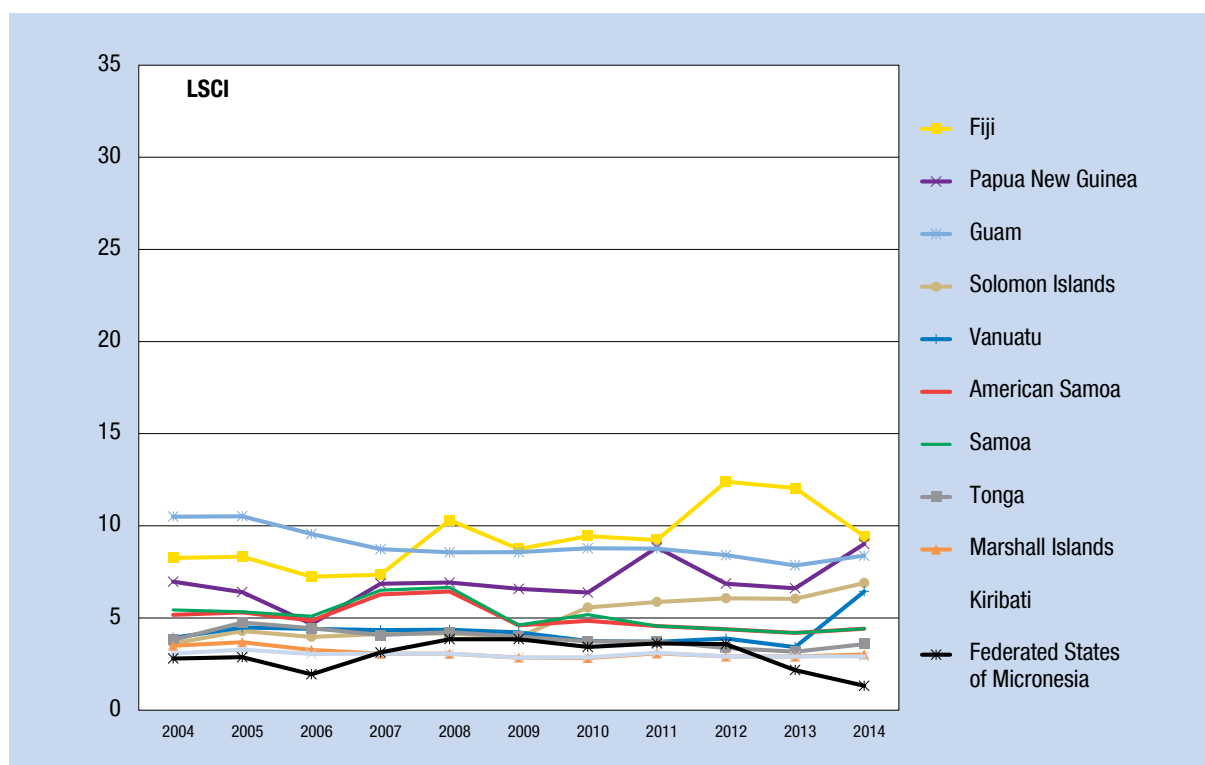
**Figure 6.4. Liner Shipping Connectivity Index, selected Caribbean SIDS, 2004–2014**


Source: UNCTAD secretariat, based on data provided by *Lloyds List Intelligence*. See <http://stats.unctad.org/lsci> (accessed 6 October 2014) for the LSCI for all countries.

**Figure 6.5. Liner Shipping Connectivity Index, selected Indian Ocean SIDS, 2004–2014**


Source: UNCTAD secretariat, based on data provided by *Lloyds List Intelligence*. See <http://stats.unctad.org/lsci> (accessed 6 October 2014) for the LSCI for all countries.



**Figure 6.6. Liner Shipping Connectivity Index, selected SIDS and other island economies of the Pacific Ocean, 2004–2014**

Source: UNCTAD secretariat, based on data provided by Lloyds List Intelligence. See <http://stats.unctad.org/lsci> (accessed 6 October 2014) for the LSCI for all countries.

world, or the 18,270-TEU vessels deployed on the main East–West services. In addition, more than half of the SIDS covered in table 6 are served by fewer than five companies. Such a small number of service providers suggests that there may exist a risk of oligopolistic markets (Wilmsmeier and Hoffmann, 2008). In addition, it is likely that diseconomies of scale, in combination with low levels of competition, will lead to higher freight costs (see section B).

To complement the data for 2014 provided in table 6, figures 6.4, 6.5 and 6.6 illustrate LSCI trends over the last 10 years for selected SIDS and other island economies in the Caribbean, the Indian Ocean, and the Pacific. Between 2004 and 2014, the global average LSCI increased by 50 per cent from 16.8 to 25 index points, while the LSCI of SIDS has largely remained stagnant. Exceptions are those countries whose ports have been able to position themselves as global or regional trans-shipment centres, such as Bahamas, Jamaica and Mauritius. These three countries not only have a higher LSCI than their neighbours, but also report a higher positive growth, roughly in line with the global trend.

## 2. Determinants of liner shipping connectivity

The position of a country within the global liner shipping network depends largely on four factors: its geographical position, its captive cargo base, its port characteristics and the regulatory framework for the liner shipping market. These four determinants will be briefly discussed in this section.

### *Geographical position*

Lying close to the main shipping routes or next to a large trading nation makes it easier for a port to attract liner companies and become a port of call. The Caribbean islands, for example, are closer to the main East–West and North–South routes than most SIDS in the Indian Ocean or the Pacific.

### *Port characteristics*

Shipping lines will be more inclined to connect a country's ports to their global liner network if they can rely on modern infrastructure and efficient operations.

This issue is also closely linked to the determinants of transport cost discussed above. If the port is considered to be costly from the carrier's perspective, the carrier will also skip it and not call, or increase its freight charges to the shipper.

### **Shipping markets**

Especially for SIDS with several islands and ports, or neighbouring SIDS where different islands may be close to seaports in a neighbour's territory, it may be convenient to allow foreign countries to connect these ports and not be limited by any market restrictions. An example that proved to be successful in improving the country's global connectivity and reduce its maritime freight costs is New Zealand. By liberalizing the cabotage between the northern and the southern island, international shipping lines were able to combine international services with cabotage services. This has made it attractive to deploy more ships on more frequent services than before, when the inter-island trade was reserved for national-flagged companies.

## **F. DISASTER-RISK REDUCTION AND CLIMATE-CHANGE ADAPTATION**

By essence, the geographical location and topological features of SIDS are particularly susceptible to the impacts of natural hazards and climate change. These include strong winds; heavy rainfall; storm surges and wave action from hurricanes, cyclones or typhoons; and rupturing of the earth's surface, ground failure and induced damage from earthquakes, volcanic eruptions and tsunamis. Small island developing States are also vulnerable to hazards of human origin such as maritime oil spills.

In the medium term, SIDS will face changes in temperature and precipitations associated with the El Niño–Southern Oscillation cycle. This will not only affect the Pacific, but will also have an influence on hurricane activity in the Atlantic. In the longer term, SIDS will also be subject to increases in temperature, stronger precipitation and sea-level rise associated with climate change. These phenomena will cause injury and loss of human and animal lives as well as damage to property and loss of livelihoods. Consequently, there is a need to take measures that prevent the hazards from becoming a disaster. While disaster-risk reduction includes a number of disciplines (disaster management, mitigation and

preparedness), this section will focus on mitigation of the impact of hazards and climate change on transport infrastructure.

### **1. Potential impact of hazards and climate change on transport infrastructure**

Various types of occurrences related to wind and water phenomena or temperature and seismic events have potential impacts on transport infrastructure and services operation. They can briefly be described as follows:

Water and wind events can arise either from increased rainfall or the action of the sea, including high tides and storm surges caused by tropical cyclones and sea level rise. Increased rainfall entails flooding, landslides and land subsidence, which compromise the integrity of roads, bridges and airport runways. Actions of the sea include coastal flooding, coastal erosion and exposure of the infrastructure to seawater. These, in turn, also inundate roads, ports and airports, erode the infrastructure base, and disrupt traffic and access.

Seismic events, apart from tsunamis, can cause damage to transport infrastructure including cracked road, seaport and airport pavements; damage to suspended infrastructure including bridges, overpasses, quay decking and their supports; and damage to buildings, communications, traffic management systems, power and liquid fuel storage facilities, mainly at seaports and airports.

Increased temperatures and droughts are associated with medium (for example, the El Niño–Southern Oscillation cycle) and long-term changes in climate. The immediate impacts of increased temperature on transport infrastructure include pavement softening and expansion; rutting and potholes; migration of liquid asphalt; heat-related weathering and buckling of pavement and concrete structures; and the stressing of expansion joints, bridges and paved surfaces due to thermal expansion. Increased temperature and drought can change soil moisture levels, thereby compromising the integrity of roads. They also lead to increased incidents of forest fires which destroy road furniture and reduce visibility, thereby disrupting traffic and affecting access and evacuation routes. Increased drought can also destabilize slopes leading to rock fall and landslides, and to land subsidence.

## 2. Measures to mitigate the impact of hazards and climate change on transport infrastructure

As is the case for many other developing countries, SIDS often have no or inadequate policies in place to address the risks for transport systems stemming from their exposure to natural hazards. In addition, barriers to SIDS adaptation include:

- Lack of financial resources to implement adaptation measures for climate change;
- Inadequate institutional system and individual capacity in issues related to climate change;
- Inadequate public awareness on climate change and its potential impact on ecosystems and the economy;
- Inadequate training and technology transfer on adaptation and mitigation technologies.

## 3. Actions at the country and regional levels

Until recently, countries have been operating under two different United Nations mandates and two different United Nations bodies when dealing with disaster-risk reduction and climate-change adaptation.

The implications of this regime have been that, in the Pacific for example, under disaster-risk reduction the Pacific Disaster Risk Reduction and Disaster Management Framework for Action (2005–2015) together with National Adaptation Plans have operated; under climate-change adaptation there has been the Pacific Regional Framework on Climate Change, National Communications and National Adaptation Plans of Action.

In a review undertaken by the United Nations Office for Disaster Risk Reduction and the United Nations Development Programme, the need to integrate disaster-risk reduction and climate-change adaptation was recognized, the rationale for integration being:

- The burden of programming development assistance will be eased;
- Duplication of effort and redundancies will be minimized;
- Potential conflicts in policy development will be reduced;
- Use of scarce resources will be more efficient;

- There will be increasing recognition, especially at community level, that there is little practical difference between the two.

In fact, some proactive activities had been undertaken, including the development of a Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management 2010–2015 by Tonga in 2010. Similar plans have been developed by the Cook Islands, the Marshall Islands and Tuvalu.

In other regions, SIDS have also been working towards joint plans. In the Indian Ocean, for example, Maldives has drafted a Strategic National Action Plan for Disaster Risk Reduction and Climate Change Adaptation 2010–2020.

In this respect, 10 SIDS have submitted national adaptation programmes of action. While most of the proposed projects deal with issues such as water resources, fisheries, agriculture, health, coral reef restoration and early warning systems, some deal with protection of transport infrastructure systems. The Cape Verde project “Integrated protection and management of coastal zones”, noted that 80 per cent of the population was located in the coastal zone and that “flat islands” such as Sal, Boavista and Maio were the most vulnerable. Amongst the benefits of the project, protection of tourist infrastructure (including airports) was noted. The Kiribati project, “Upgrading of coastal defences and causeway”, included as an objective “to prevent encroaching coastal erosion from affecting public infrastructure such as roads, airfields and community public assets by upgrading existing seawalls”.

The Maldives project “Coastal protection of Male’ International Airport to reduce the risk from sea induced flooding and predicted sea level rise” noted that “due to their low elevation and proximity to coastline, the infrastructure of the five main airports are highly vulnerable to damage from severe weather related flooding and future climatic change”. The activities proposed within the project were (a) to undertake detailed technical and engineering studies for the coastal protection of Male’ International Airport, including cost effectiveness of the proposed solutions, (b) to develop detailed engineering and design of coastal protection measures for the airport, and (c) to construct demonstration coastal protection measures on part of the coastline of the Male’ International Airport.

The Samoa project “Implement coastal infrastructure management plans for highly vulnerable districts” included upgrading of roads, culverts and drains as part of its activities.

Solomon Islands included two projects with transport infrastructure components, including “Coastal protection” and “Infrastructure development”. One of the outcomes of the coastal protection project was “construction and climate-proofing of engineered coastal roads, bridges and other key infrastructure”, while the outcomes for the infrastructure development project were (a) improved operational safety and efficiency of airport and airport facilities, (b) constructing of an engineered protective structures in the harbour and coastal areas, and (c) climate-proof key infrastructure. Some of the activities to be included in the infrastructure project included climate-proof design criteria for airport development with a 60-year recurrence; construction of protective seawalls, revetments, culverts, bulkheads, jetties and floodgates; building of drainage systems for the protection of airports; and replanting of foreshore vegetation.

A number of initiatives have also taken place at the regional level that include or recognize the importance of climate-change adaptation and disaster-risk reduction in the transport sector. The main ones are the Pacific Adaptation to Climate Change Programme, the Caribbean Community Climate Change Centre, which has adopted a series of adaptation projects, and the Indian Ocean Commission project named *Acclimate (Adaptation au changement climatique)* between 2008 and 2012. This latter project included a number of studies to increase understanding and raise awareness, and developed a “Framework document for regional adaptation strategy to climate change in member countries of the Indian Ocean Commission, 2012–2020”.

## G. THE WAY FORWARD

Some issues discussed in this chapter will need to be addressed as a matter of urgency by the international community and SIDS. In order to consider possible new approaches, and in line with its consensus-building approach, UNCTAD organized an ad hoc expert meeting held in Geneva on 11 July 2014, timed in the lead up to the 2014 Third International Conference on Small Island Developing States (Samoa Conference). The meeting offered an opportunity to focus international attention on the unique transport-related challenges facing SIDS (UNCTAD, 2014). Experts participating in the meeting were invited to make suggestions on the way forward and identify some concrete actionable recommendations. The proposed actions and measures of particular relevance may be regrouped as detailed below.

### 1. Small island developing States transport- and trade logistics-related challenges

Smallness and remoteness undermine the transport and trade logistics of SIDS. The challenge for SIDS is to avoid high transport costs that compress trade flows and reduce the overall transport connectivity. Domestic inter-island transport is an important issue for SIDS that are made up of islands spread across vast distances.

There is a need to promote forward-looking research and to seek to foster new ideas to generate the port logistics and development framework that SIDS can use. Small island developing States should seek to derive gains from operating at a small scale, making use of local resources and catering for local needs. Relevant examples include developing niche markets, building partnerships with traders and focusing on areas where SIDS master the processes and where local resources are available.

### 2. Climate change impacts and adaptation for transport infrastructure

Rising air and ocean temperatures, rising sea levels and surges, and higher wind speeds constitute some of the key climatic risk factors for SIDS. A better understanding of the climate-change challenge in its two dimensions, namely mitigation and adaptation, is important. The need to adapt to unavoidable climate-change impacts on transport, in particular seaport and airport infrastructure, are a concern for all countries.

Small island developing States have the world's highest relative disaster risk. Building resilience at seaports and airports through adaptation action is a necessity for SIDS, given their high dependency on these facilities. Potential adaptation strategies for SIDS include engineering, technological developments, planning and development, management systems and insurance schemes. Risk management must become a central element of government policy and greater investments in disaster-risk reduction and climate-change adaptation are likely to reap greater benefits in SIDS than in any other group of countries. Risk strategies must be based on reliable and accurate facts and information.

### **3. Financing sustainable and resilient transport systems**

For those SIDS that are not least developed countries, access to concessionary loans is often limited and the cost of direct investment in infrastructure can be prohibitive. New mechanisms are needed by creating blending facilities that increase financing by leveraging other sources to close the prevailing financial gap. Blending facilities were set up in both the Caribbean and Pacific regions of the African, Caribbean, and Pacific Group of States. These facilities help improve the sustainability of the projects, given the financial discipline associated with them, and the fact that countries submitting them for funding have ownership of the projects.

Blending facilities also provide a resource stream to support climate mitigation and adaptation. Financial resources for infrastructure development include, in part, climate finance, but most importantly national resources and some innovative elements of financing. There is a need to build climate-finance readiness (for example, to develop skills related to identifying effective funds for SIDS); to strengthen national planning as well as public policy and financial systems for climate response (for example, climate-change finance assessment tools). Small island developing States need to draw on untapped resources and develop practical approaches on innovative financing mechanisms.

These and additional actions fostered by the Samoa Conference should contribute to better addressing the many challenges faced by SIDS in the maritime transport of their trade.

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## ENDNOTES

- <sup>115</sup> The list of countries being considered by UNCTAD as qualifying for the designation of SIDS are the following: in the Caribbean region: Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago; in the Indian Ocean region: the Comoros, Maldives, Mauritius and Seychelles; in West Africa: Cape Verde, and Sao Tome and Principe; in the Pacific region: Fiji, Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu and Vanuatu.
- <sup>116</sup> Hub-and-spoke: transfer between larger mainline vessels and smaller feeder vessels. Interlining: transfer between two mainline services that cover a different set of ports in the same range. Relaying: transfer between two different mainline services for onward shipment.
- <sup>117</sup> Brand names of the various global operators are shown in brackets: CMA-CGM (Delmas, ANL, US Lines, Feeder Associate System, Cagema, MacAndrews, Cheng Lie Navigation Co. and CoMaNav), Maersk Line (Safmarine, MCC-Transport, Seago Line and Mercosul Line), MSC (WEC Lines).
- <sup>118</sup> The Indian Ocean islands belonging to the UNCTAD list include those of the Comoros (Faboni, Moroni and Mutsamuda), Maldives (Male'), Mauritius (Port Louis) and Seychelles (Port Victoria).