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COVID-19 AND MARITIME TRANSPORT

**NAVIGATING THE CRISIS
AND LESSONS LEARNED**



**COVID-19
RESPONSE**

Geneva, 2022

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The report was externally edited by John Rogers.

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Abbreviations

AIS	automatic identification system
COVID-19	coronavirus disease 2019
IAPH	International Association of Ports and Harbors
ILO	International Labour Organization
IMO	International Maritime Organization
KPA	Kenya Ports Authority
LAC	Latin America and the Caribbean
LDC	least developed country
LNG	liquified natural gas
LPG	liquified petroleum gas
LSCI	Liner Shipping Connectivity Index
MPA	Maritime and Port Authority of Singapore
MSC	Mediterranean Shipping Company
NPA	Nigeria Ports Authority
NSC	Nigerian Shippers' Council
ONE	Ocean Network Express
Ro-Ro	roll-on/roll-off
SIDS	small island developing States
TEU	twenty-foot equivalent unit
UNCTAD	United Nations Conference on Trade and Development
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNECA	United Nations Economic Commission for Africa
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCWA	United Nations Economic and Social Commission for Western Asia
WHO	World Health Organization
WPSP	World Ports Sustainability Program

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PART I: NAVIGATING THE CRISIS AND LESSONS LEARNED

Introduction

During the first year of the COVID-19 pandemic, global maritime transport and trade were severely affected. Amid supply-chain disruptions, global demand contraction and economic uncertainty, the world economy suffered both supply and demand shocks. The onset of new variants of the virus and a surge in infections being reported across regions continued to disrupt economies, trade and global logistics. The rapid recovery in containerized trade, supported by stimulus packages, and increased consumption and ecommerce stretched maritime supply chains.

The pandemic exposed the high level of global interdependency. With supply chains and international maritime transport acting as transmission channels, disruptions at local level entailed far reaching global impacts including crippling port congestion, soaring freight rates, and plummeting service reliability. As the disruption hit, shipping and ports have had to respond and manage not only the immediate concerns raised by the pandemic, but also the longer-term considerations, notably potential shifts in supply-chain design, globalization patterns, consumption and spending habits and, in general, a growing focus on risk assessment and vulnerability reduction, sustainability and decarbonization.

To manage capacity in the face of reduced demand, shipping carriers revisited their strategies. They reconsidered the frequency of their services and adjusted the levels of maritime connectivity between countries¹ and regions. Ports worldwide and other logistics-sector stakeholders all sought to address challenges to business and operational continuity while maintaining safety and the well-being of workers and the broader population. Commercial ships of different types managed to secure continued access to ports all over the world and deliver the world's food, energy, raw materials, and manufactured goods and components – including vital medical supplies.

Recognizing the magnitude of the challenge, the international community called on governments and relevant stakeholders to support the maritime transport sector and help shipping and ports navigate through the crisis. For example, as part of its response to the pandemic, UNCTAD issued a call for action to keep shipping and ports operational.² The Secretaries-General of UNCTAD and the International Maritime Organization (IMO) issued a joint statement in support of keeping ships moving, ports open and cross-border trade flowing during the pandemic.³ Furthermore, and jointly with the International Labour Organization (ILO), IMO and the World Health Organization (WHO), UNCTAD called upon stakeholders to take action to support the world's 1.9 million seafarers from being unduly impacted by the COVID-19 pandemic and associated restrictions.⁴

This report has been prepared under the framework of the United Nations Development Account project on "[Transport and trade connectivity in the age of pandemics: Contactless, seamless and collaborative UN solutions](#)". It describes how the COVID-19 pandemic has shocked the global maritime transport system and sets out some of the key effects on the sector. It builds on the [UNCTAD preliminary impact assessment report](#) on "*COVID-19 and Maritime Transport: Impacts and Responses*" (UNCTAD, 2020a), an extensive data set on liner shipping connectivity and fleet capacity deployment as well as high-frequency data such as automatic identification system (AIS)-based data on weekly port calls.

¹ The term "countries" also includes the many territories mentioned in this publication.

² UNCTAD, COVID-19: A 10-point action plan to strengthen international trade and transport facilitation in times of pandemic, *Policy Brief* No. 79, April 2020.

³ IMO and UNCTAD: Joint statement in support of keeping ships moving, ports open and cross-border trade flowing during the COVID-19 pandemic, 8 June 2020.

⁴ ILO, IMO, UNCTAD and WHO Joint Statement, Joint statement urging continued collaboration to address the crew change crisis, safeguard seafarer health and safety, and avoid supply chain disruptions during the ongoing COVID.19 pandemic, 22 February 2022, https://unctad.org/system/files/non-official-document/un-joint-statement-on-crewing-crisis_en.pdf.

Additionally, the present report draws upon insights gained during regional webinars held in the course of 2020 and 2021 and targeting stakeholders from Asia, Africa, and Latin America and the Caribbean (LAC), together with input gathered through an online survey distributed widely among various stakeholders and across regions in May-July 2021.

Part I of this report provides a global overview of how the COVID-19 pandemic and related restrictions affected shipping across different segments, and highlights challenges arising from the disruption across ports and hinterland connections. Part I also examines response and mitigation measures implemented by various stakeholders. Part II considers the regional perspectives of Africa, Asia, LAC. Part III concludes with a set of lessons learned which can inform future efforts towards resilience-building in maritime transport.

Overview of impacts and challenges

After the initial shock that hit China, the world economy and global trade, faced a dramatic turn for the worse after COVID-19 was declared a pandemic in mid-March 2020. A demand shock followed the supply shock. The first half of 2020 was marked by widespread lockdowns, travel restrictions, fast-rising unemployment, government rescue packages, and oil and stock market crashes (figure 1). The third phase – progressive adaptation – which included a rebalancing of supply and demand, led to a fourth phase marked by diverging trends in different economies.

Figure 1: The four phases of the pandemic-induced supply and demand shocks



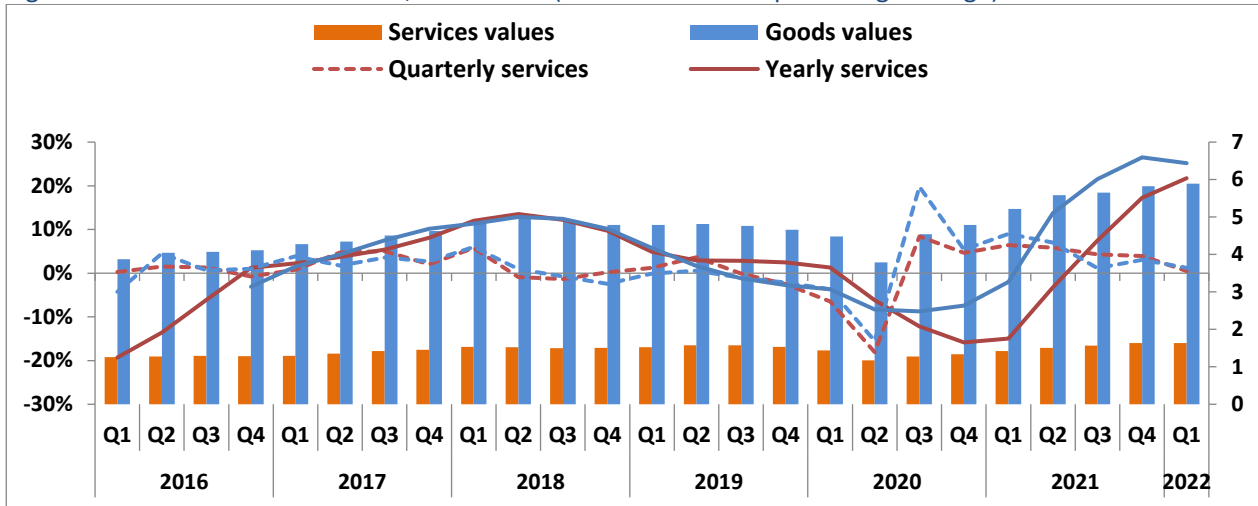
Source: Notteboom et al. (2021).

Global merchandise trade

World merchandise trade contracted by –9 per cent in 2020 (UNCTAD, 2021a). Merchandise trade fell by –5 per in Q1 2020 cent while transactions in March (–10 per cent) and April (–27 per cent) were remarkably fewer. A substantial decline of –15 per cent occurred in Q2 2020 (UNCTAD, 2020b).

A quick recovery followed in the second half of the year, largely reflecting a rebound in goods trade (figure 2). Trade in services continued to lag below averages. In Q4 2020, goods trade grew by about 8 per cent on a quarter-over-quarter basis, while trade in services stagnated. As a result, amid economic disruptions from COVID-19, global trade, including merchandise and services, held up relatively well in 2020.

Figure 2: Global merchandise trade, 2016–2022 (trillion dollars and percentage change)



Source: UNCTAD (2022).

Note: Quarterly growth is the quarter over quarter growth rate of seasonally adjusted values. Annual growth refers to the last four quarters. Figures for Q4 2021 are preliminary. Q1 2022 is a nowcast.

Developing and developed countries were both affected, with developed countries experiencing the sharpest annual drop in Q2 2020 (over –20 per cent decline) (table 1). It was only in Q4 2020 that trade in these economies rebounded, with both imports and exports reaching their 2019 levels. Trade in developing countries fell in Q2 and Q3 but at a relatively lower pace. The rebound in Q4 2020 was relatively more dynamic in these economies, leading to a 6 per cent growth of imports and an 8 per cent growth of exports in Q4 2020. Rapid recovery in East Asia was the main driver. When East Asian countries are excluded, imports of the remaining developing countries fell by –12 per cent during Q3 2020 while exports lowered by –14 per cent. While reduced exports from developing countries (excluding East Asia) reflected lower demand in destination markets, falling imports were caused by suppressed demand and factors such as exchange rate movements, concerns regarding debt and shortage of foreign currency.

Table 1: Global merchandise trade 2019–2020 (percentage change)

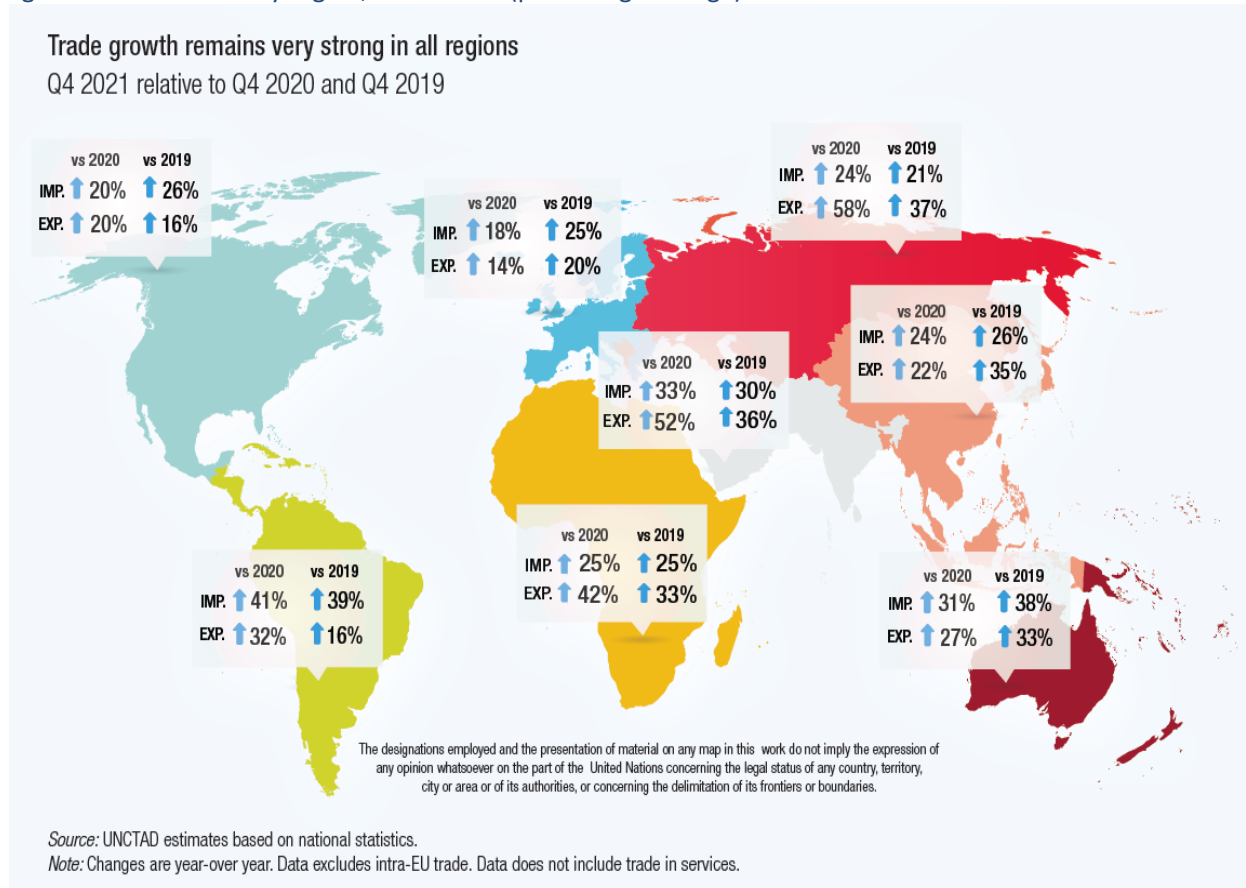
	Q1 2020		Q2 2020		Q3 2020		Q4 2020	
	Import	Export	Import	Export	Import	Export	Import	Export
Developed countries	-6	-3	-20	-22	-5	-9	1	-1
Developing countries	-2	-7	-18	-17	-5	-2	6	8

Source: UNCTAD estimates based on national statistics.

Note: Changes are year-over-year. Data exclude intra-European Union trade. Data do not include trade in services.

East Asian economies capitalized on a booming global demand for COVID-19-related products (figure 3). Meanwhile, Western Asian countries registered declines of up to –40 per cent and continued to register double-digit percentage export declines until the end of the year. Starting in Q2 2020, trade was negatively impacted in sub-Saharan Africa, LAC, North Africa, North America and the European Union. In East Asia and the Pacific region trade declined at a relatively less severe pace, and there was an increase in Q4 2020 in both imports and exports, as compared with the same period of 2019. China performed better than other major economies, recording growth in goods exports in the second half of 2020. Following a decline of –6 per cent in the first half of the year, when all major economies experienced significant downturns in both imports and exports of goods, China’s exports increased by 18 per cent in Q3 2020. In Q4, China’s exports surged by 17 per cent compared with Q4 2019. By the end of the year, exports by South Africa, Japan, the Republic of Korea and the European Union all recorded more positive trends (UNCTAD, 2021a).

Figure 3: Global trade by region, 2019–2021 (percentage change)



Source: UNCTAD (2022).

During Q1 2020 trade across sectors fell, with some sectors being more affected than others (table 2). In Q1 2020 textiles and apparel declined by –11 per cent. Trade in office machinery and automotive fell by about –8 per cent. In contrast, the value of international trade in the agri-food sector grew by about 2 per cent. Trade in transport equipment and fuels fell, respectively, by –30 and –50 per cent in April. Sharp contraction in energy trade (–40 per cent) and automotive (–50 per cent) products were also recorded (UNCTAD, 2020b).

As the pandemic forced store closures in major economies, lower demand induced major apparel brands to delay and cancel orders. Suppliers in garment-producing countries faced order cancellations, reduced order volumes, and extended payment terms, leaving many having to reduce operations or stop them altogether. As it is standard practice for brands not to pay for products until after they are shipped, when an order was put on hold or cancelled payments were also held or cancelled. Some brands even asked for discounts on orders already shipped.⁵

The trade recovery of the second half of 2020 permeated most sectors of goods, except for energy (Q3: –34 per cent; Q4: –33 per cent) and transport equipment (Q3: –29 per cent; Q4: –32 per cent). Trade in these two sectors was still about one third lower in the second half of 2020 relative to the same period in 2019. While in Q3 2020 trade recovery was sustained by goods for which demand had increased due to COVID-19, i.e. textiles (including personal protective equipment) and (home) office equipment, the recovery was much more broad-based in Q4 2020, with trade in most sectors recording an expansion (UNCTAD, 2021a).

⁵ See <https://www.workersrights.org/issues/COVID-19/tracker>.

Table 2: Global trade by sector 2019–2020 (percentage change)

	Q1 2020	Q2 2020	Q3 2020	Q4 2020
Agri-food	2	0	3	7
Apparel	-11	-6	-6	1
Chemicals	0	-13	-3	6
Communication Equipment	-6	0	1	11
Energy	5	-52	-34	-33
Machinery various	-8	-14	2	10
Metals	-2	-10	2	13
Office Equipment	-8	9	16	14
Precision instruments	-3	-13	0	7
Road vehicles	-8	-49	-5	12
Textiles	-11	3	40	16

Source: UNCTAD, Global Trade Update, various issues.

Note: Percentage changes in world trade are year-over-year. Changes are estimated from HS6 digits data of China, the European Union and the United States of America. Data exclude intra-European Union trade.

Maritime transport has been essential in ensuring access to essential food and medical items and keeping trade flowing. That said, levels of maritime trade and the frequency of the maritime services were also affected. International maritime trade volumes contracted by -3.8 per cent in 2020, a drop not as dramatic as initially feared (UNCTAD, 2021c). This is because after the initial shock, by Q3 2020, containerized trade experienced a swift return in volumes supported by the unlocking of the pent-up demand, shifts in consumer spending towards goods (pharmaceuticals, health, and home office), changes in shopping patterns and growth in e-commerce. Improved sentiment due to the roll-out of vaccines later in 2020, easing economic impacts and restocking and inventory-building, also contributed to the bounceback.

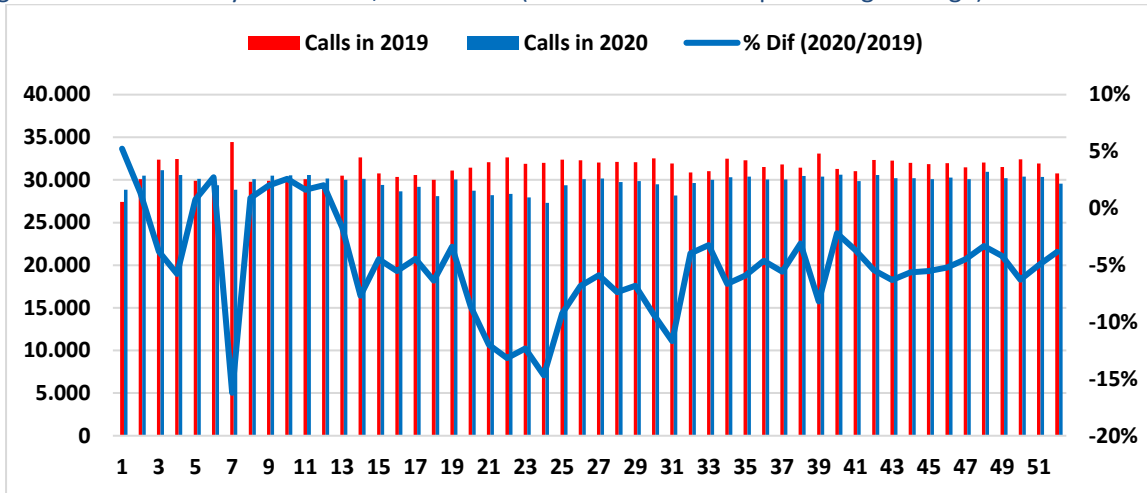
Global vessel calls⁶

In 2020, cargo vessel calls fell by -5.1 per cent compared with the previous year.⁷ When passenger vessels are also included, the drop in global port calls is nearly double. The decline in vessel calls started in week 12 of 2020 when the pandemic was declared (figure 4). By Q2 2020, the number of vessel calls fell by -8.3 per cent (figure 5) as compared with 2019. The overall situation remained unchanged at the start of Q3 2020, though by July 2020 signs of the social and economic adaptation to the new conditions as described in figure 1 became more visible. Adaptation to the new conditions occurred across regions as governments implemented new measures and protocols that replaced lockdowns. Compared with Q4 2019, global vessel calls were -4.7 per cent lower in Q4.

⁶ Throughout this document and unless otherwise specified, vessel calls and cargo vessel calls refer to calls by vessels carrying goods/cargo and Ro-Ro ships, excluding passenger vessels.

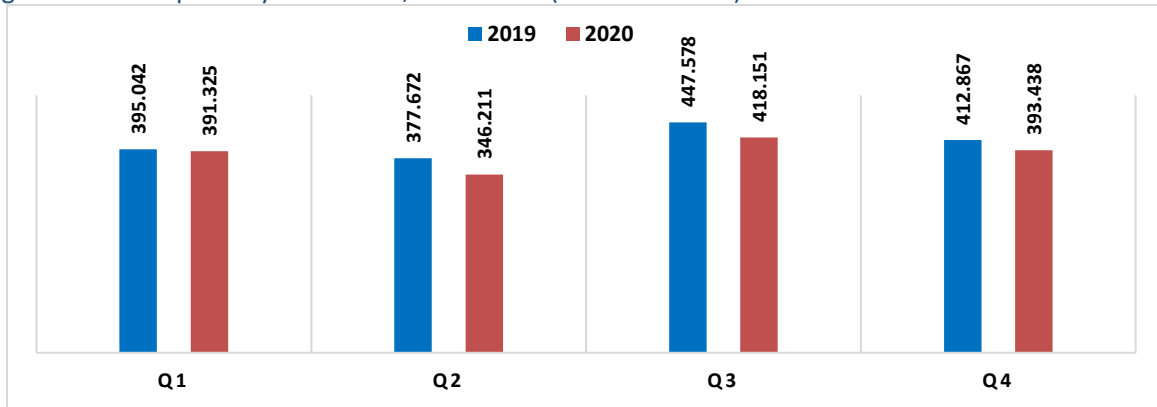
⁷ UNCTAD, 2021, UNCTADstat, Port call and performance statistics: number of port calls, annual, <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=194889>.

Figure 4: Global weekly vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

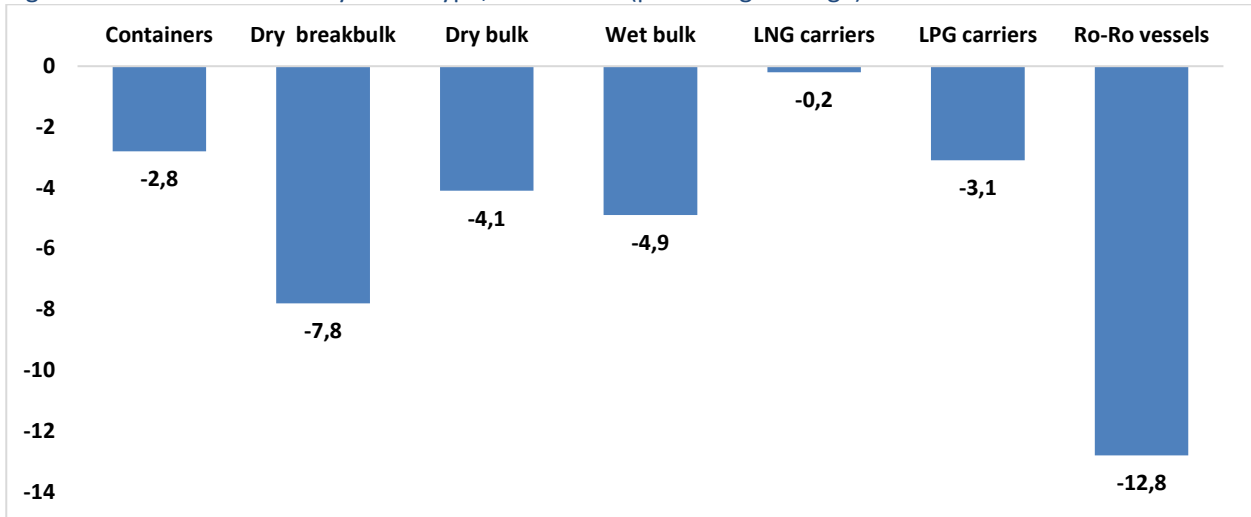
Figure 5: Global quarterly vessel calls, 2019–2020 (number of calls)



Source: Cargo vessels; passenger vessels excluded; UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

A more complex picture emerges when looking at port calls by cargo type (figure 6). Impact on the shipping markets varied. Container ships continued to trade worldwide in 2020. Despite the cancellation of some scheduled sailings, the scale of the so-called “blank sailings” was relatively low. In 2020, port calls by container vessels were down by –2.8 per cent compared with 2019. Impact on other shipping segments was higher. Calls by dry bulk and wet bulk carriers fell at double the rate of container ships (–4.1 and –4.8 per cent, respectively). Larger declines were observed among dry breakbulk carriers (–7.8 per cent) and roll-on/roll-off (Ro-Ro) vessels (–12.8 per cent). As liquified natural gas (LNG) and liquified petroleum gas (LPG) are used for the purposes of electric power plants and household energy, port calls by LNG and LPG carriers were less affected. Calls by LNG- and LPG-carrying vessels declined by –0.2 and –3.1 per cent, respectively.

Figure 6: Global vessel calls by vessel type, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Vessel calls by region

Regional variations were observed across shipping market segments (figure 7) and regions (table 3), with Asia being the least affected. The decline in container vessel calls relating to intra-Asian trade (–0.8 per cent) was marginal while ports in Oceania (–12 per cent) and Europe (–6.8 per cent) recorded significant drops in cargo and passenger vessel calls. Calls at all Asian ports by passenger vessels contracted by –12 per cent.

Europe and North America, two regions where maritime trade includes plenty of consumable goods, saw cargo vessel calls drop by –8.2 and –6.9 per cent, respectively. The initial shock, in both cases, was more significant than any other part of the world (figure 8). The impact remained substantial in Q3 2020 (approximately –9.8 per cent) before moderating in Q4. Meanwhile, by Q4 2020, cargo vessel calls in North America had returned to their 2019 levels. The fall in container vessel calls at European ports was larger than any other region except for Oceania (table 3). In North America, container vessel calls fell by –2.6 per cent while calls by dry breakbulk carriers fell by a marginal –1.2 per cent. In 2020, wet bulk carriers and Ro-Ro vessels recorded port call declines of –11.3 and –16.8 per cent, respectively, compared with the previous year. In contrast, North American port calls by LNG and LPG carriers increased in 2020.

Vessel calls in LAC fell by –8.6 per cent. Port calls by container vessels performed relatively better with a drop of –4.3 per cent. A different trend occurred in the smaller shipping market of LNG and LPG carriers. In 2020, calls by LPG carriers fell by –5.3 per cent while calls by of LNG-carrying vessels increased by 3.2 per cent as compared with 2019. Asian economies saw a relatively marginal decline in cargo vessel calls (–2.6 per cent). Their early success in managing the pandemic helped them maintain much of their production and exporting activities. A strong start during Q1 2020 and continued intraregional trade throughout the year helped the region sustain the overall calls in 2020. Container vessel calls fell marginally (–0.8 per cent) while calls by dry bulk, wet bulk and LNG carriers was marginal. Calls by LPG carriers declines by –2.2 per cent while calls by Ro-Ro vessel recorded a double-digit drop of –13 per cent.

Elsewhere in Africa, vessel calls declined –5.2 per cent. Container ship calls in Africa declined by –3.9 per cent in 2020. Calls by dry breakbulk vessels was more severe than any other type of cargo vessel (–8.3 per cent). Remaining segments showed some resilience. Port calls by wet bulk carrying vessels declined by –2.8 per cent. Calls by dry bulk vessels and LNG carriers dropped by –4.9 and –5.0 per cent, respectively. The LPG sector performed better than any other shipping market with calls in 2020 increasing by 7.5 per cent. As to Oceania, it was also largely affected by the crisis as vessel calls in the region were –8.3 per cent

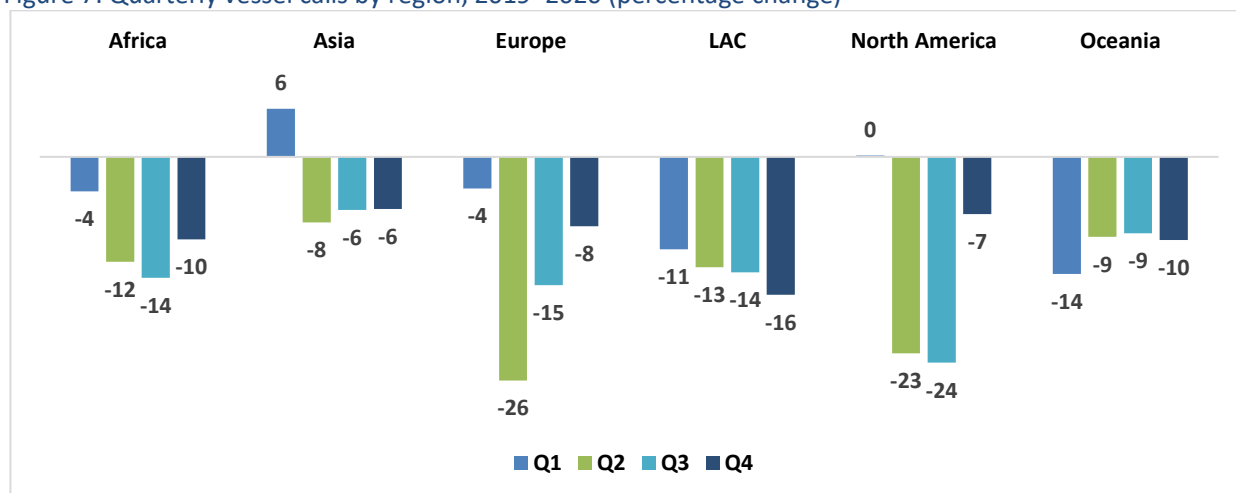
less than in 2019. This significantly affected the region’s economies given their maritime links with other parts of the world. The decline moderated in Q2 2020, except for calls by wet bulk carriers that saw a marginal reduction. The remaining vessels called less frequently at Oceania’s ports with container vessels recording a drop of –12 per cent. Dry breakbulk carriers were affected the most (–17.6 per cent).

Table 3: Vessel calls by region and vessel type, 2019–2020 (percentage change)

	All	Africa	Asia	Europe	LAC	North America	Oceania
Total (2020)	-5.2	-5.3	-2.6	-8.5	-8.6	-6.9	-8.3
Containers	-2.8	-3.9	-1.0	-6.8	-4.3	-2.6	-12
Dry breakbulk	-7.8	-8.3	-5.5	-10.0	-14.8	-1.3	-17.6
Dry bulk	-4.1	-4.9	-1.4	-9.5	-8.6	-5.8	-6.3
Wet bulk	-4.9	-2.8	-1.8	-6.5	-10.0	-11.3	-0.6
LNG carriers	-0.2	-5.0	1.1	-4.6	3.2	19.9	-6.2
LPG carriers	-3.1	7.5	-2.3	-11.6	-5.3	12.2	11.7
Ro-Ro vessels	-12.8	-18.2	-13.0	-11.0	-16.8	-17.8	-13.1

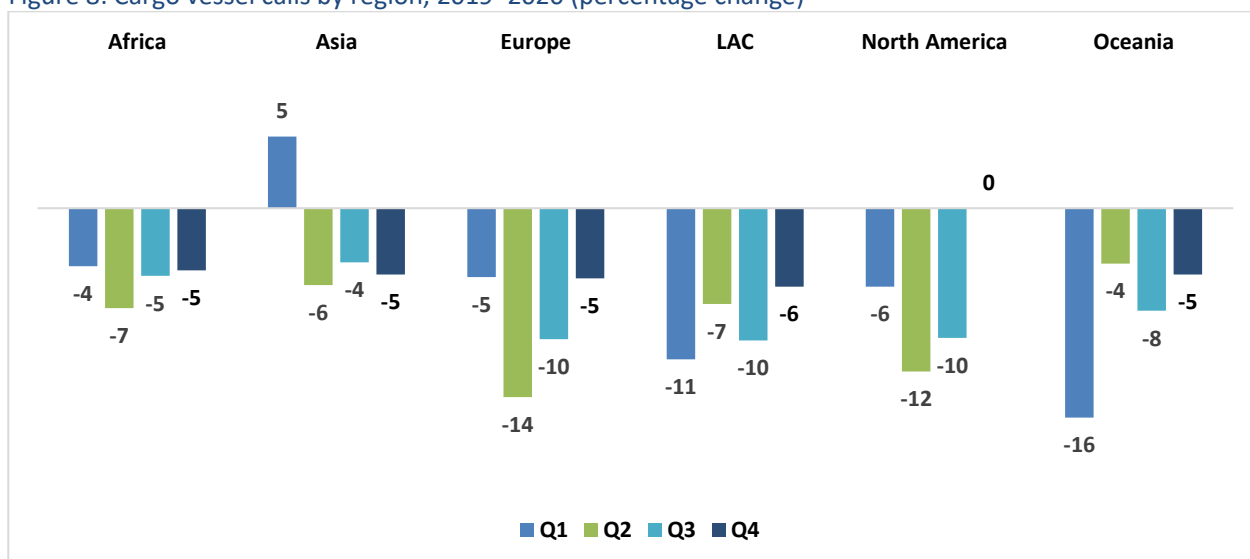
Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Figure 7: Quarterly vessel calls by region, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Figure 8: Cargo vessel calls by region, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Vessel calls by economy grouping

Vessel calls in developed economies fell by –11.7 per cent in Q2 2020 compared with the same period in 2019 (table 4). The initial shock did not last long, as lockdowns were removed and economies started progressively reopening. The overall picture improved in Q3 2020 (–9.4 per cent) with Q4 2020 pointing to a recovery (–4.7 per cent). In the full year 2020, vessel calls in developed countries declined by –7.3 per cent. Meanwhile, calls fell by –8.0 per cent in the economies in transition, more than double the rate in developing economies (–3.8 per cent). Least developed countries (LDCs) experienced comparatively fewer negative trends than other economies, with the number of calls in 2020 being just –0.2 per cent lower than the same period in 2019.

Table 4: Quarterly cargo vessel calls by economy type, 2019–2020 (percentage change)

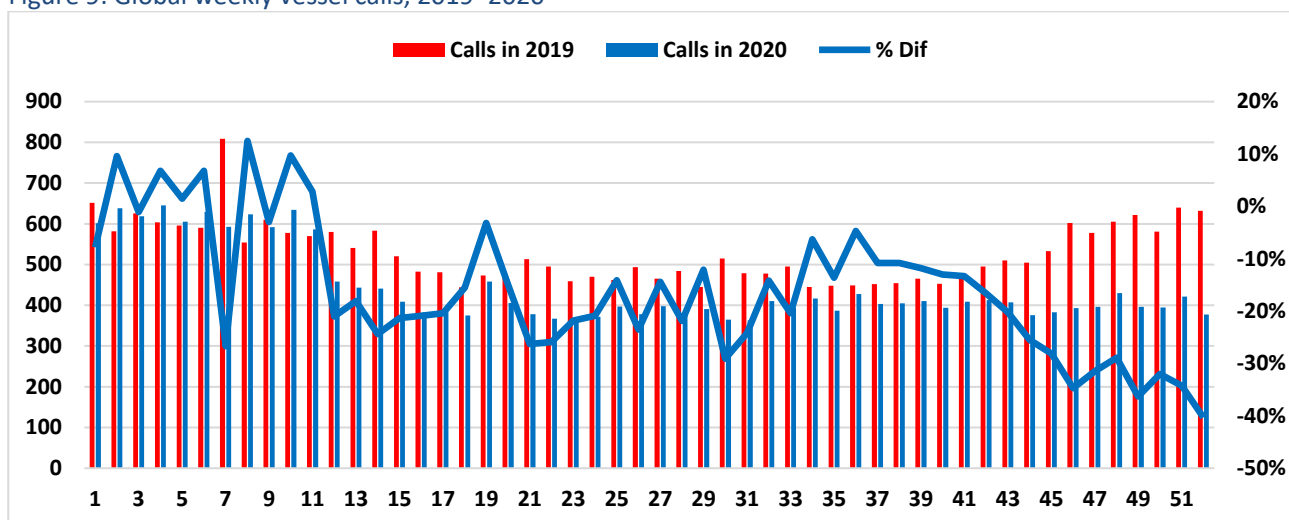
	Developed countries	Developing countries	LDCs	Transition economies	Small island developing States
Total (2020)	–7.3	–3.8	0.2	–8.0	–16.1
Q1	–3.3	1.4	–2.9	–14.6	–2.8
Q2	–11.7	–6.6	2.2	–6.3	–20.1
Q3	–9.4	–4.8	–1.4	–9.7	–15.1
Q4	–4.7	–5.2	3.3	–1.0	–28.2

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Vessel calls in SIDS

Small island developing States were significantly affected by the COVID-19 disruption (figure 9 and table 5). While in Q1 2020, the decline was relatively limited (–2.9 per cent), vessel calls slipped rapidly afterwards. The situation deteriorated as vessel calls in Q2 dipped by –19.7 per cent, on the back of the rapid drop in container vessel calls (–29.3 per cent). Nearly all vessel types recorded a slump in the number of calls made in the second half of 2020. Total vessel calls dropped by –28.2 per cent in Q4. SIDS were among the countries most affected in the second half of the year.

Figure 9: Global weekly vessel calls, 2019–2020



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 5: Vessel calls by vessel type in SIDS, 2019–2020 (percentage change)

	All	Containers	Breakbulk	Dry bulk	Wet bulk	LNG	LPG	Ro-Ro	Passenger
Total (2020)	-16.1	-0.1	-16.3	-31.5	-5.5	-17.7	-13.0	-8.3	-33.5
Q1	-2.9	3.4	-13.1	-16.2	7.0	-18.5	18.4	-7.4	-5.3
Q2	-20.1	2.5	-29.3	-42.4	-10.9	-16.1	-27.3	-1.4	-40.9
Q3	-15.1	-2.0	-15.6	-35.6	-4.0	-11.5	-15.3	-14.2	-34.2
Q4	-28.2	-4.3	-8.5	-34.5	-15.2	-25.0	-22.2	-9.0	-63.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

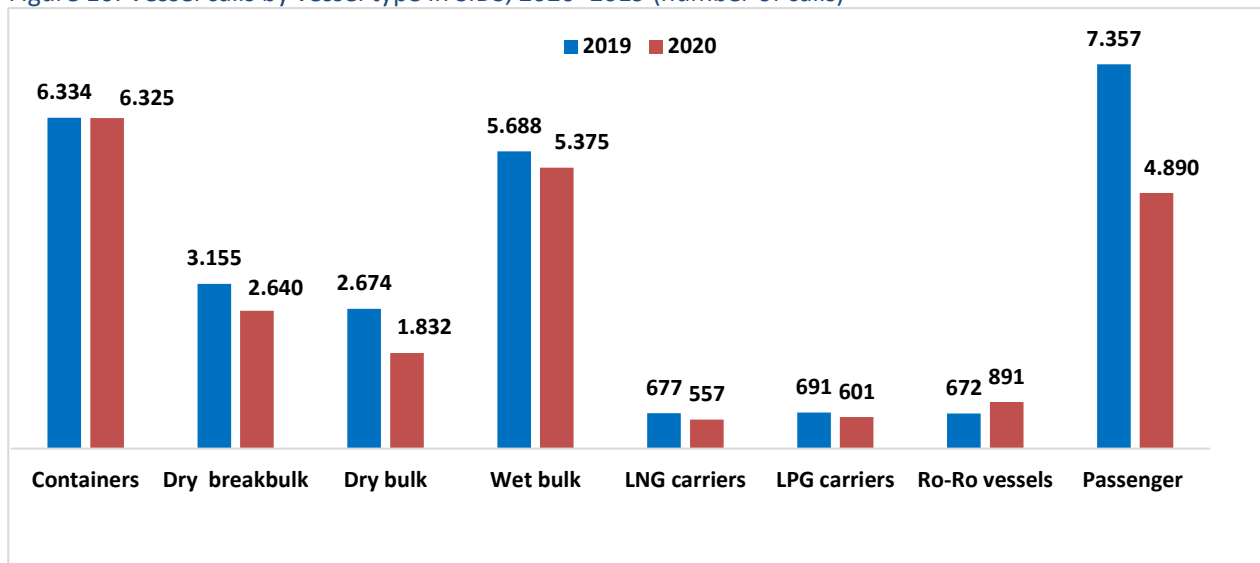
In the first half of 2020, container vessel calls in SIDS increased (Figure 10:). Carriers continued to deliver essential cargoes and maintain trade to and from SIDS. In Q1 and Q2, container vessel calls exceeded those recorded in the first half of 2019. Despite few blank sailings in the second half of the year, container port calls were sustained. By the end of 2020, container vessel calls in SIDS were -0.1 per cent, or nine vessels less than the previous year. Dry bulk vessel calls declined -31.5 per cent in 2020. Substantially lower calls were recorded in the case of LNG (-17.7 per cent) and LPG (-13 per cent) carriers. Port calls by Ro-Ro vessels, often considered the lifelines of SIDS,⁸ declined by -8.3 per cent. Calls by passenger vessels slumped by -33.5 per cent. Following a moderate decline in Q1 2020, calls dropped by -40.9 per cent in Q2 as compared with the same period in 2019. The drop intensified in Q4, with passenger vessel calls dipping by -63 per cent. Unlike other country groupings, for SIDS the decline in vessel port calls occurred mainly in the last part of the year.

Considering cargo-carrying vessels only, SIDS in the Caribbean region suffered a major decline included Grenada (-17.8 per cent), Saint Kitts and Nevis (-19 per cent) and Trinidad and Tobago (-11.4 per cent) (Table 6:).

⁸ See, for example, UNCTAD (2014).

The remaining SIDS in the region recorded drops in cargo vessel calls of less than –4.0 per cent. When accounting for passenger vessel calls, however, the picture alters dramatically, with for example Antigua and Barbuda, the Bahamas, Grenada, and Saint Kitts and Nevis recording large reductions. SIDS in Africa experienced a significant decline in cargo vessel calls (–26.1 per cent) in 2020. All SIDS experienced a decrease in vessel calls including Cabo Verde (–47.8 per cent) and the Comoros (–33.6 per). Asian SIDS, namely Maldives and Timor-Leste, also experienced a significant decline in cargo vessel calls (–13.5 per cent). The drop heightens (–17 per cent) when passenger vessels are included. In 2020, five Pacific SIDS suffered substantial cargo vessel call declines. These included Kiribati (–18.3 per cent), the Marshall Islands (–11 per cent), Samoa (–12.2 per cent), Solomon Islands (–12.6 per cent) and Tonga (–10.1 per cent). The decline in Fiji, which together with the Marshall Islands receives the largest number of cargo vessel calls in the Pacific SIDS, stood at –6.1 per cent. Pacific SIDS receiving fewer vessel calls each year, i.e. approximately 100 cargo vessels, did not see a substantial shift compared with the previous year.

Figure 10: Vessel calls by vessel type in SIDS, 2020–2019 (number of calls)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 6: Vessel calls by vessel type in SIDS, 2020–2019 (number of calls and percentage change)

	All types of vessels			Cargo vessels only		
	2019	2020	Δ(2020/2019) (%)	2019	2020	Δ(2020/2019) (%)
All SIDS	27 548	23 111	-16.11	20 191	18 221	-9.76
Africa	4 020	2 954	-26.52	3 852	2 847	-26.09
Cabo Verde	563	300	-46.71	501	273	-45.51
Comoros	1 000	664	-33.60	1 000	664	-33.60
Mauritius	2 053	1 683	-18.02	1 993	1 642	-17.61
Sao Tome and Principe	52	43	-17.31	50	43	-14.00
Seychelles	352	264	-25.00	308	225	-26.95
Asia	577	479	-16.98	541	468	-13.49
Maldives	372	320	-13.98	342	311	-9.06
Timor-Leste	205	159	-22.44	199	157	-21.11
LAC	19 670	16 721	-14.99	13 084	12 397	-5.25
Antigua and Barbuda	675	476	-29.48	339	348	2.65
Bahamas	5 638	3 959	-29.78	2 815	2 744	-2.52
Barbados	1 088	1 165	7.08	665	639	-3.91
Dominica	316	239	-24.37	177	177	0.00
Grenada	466	318	-31.76	281	231	-17.79
Jamaica	4 287	3 951	-7.84	3 827	3 757	-1.83
Saint Kitts and Nevis	699	403	-42.35	310	251	-19.03
Saint Lucia	1 056	836	-20.83	666	666	0.00
Saint Vincent and the Grenadines	487	421	-13.55	342	341	-0.29
Trinidad and Tobago	4 958	4 953	-0.10	3 662	3 243	-11.44
North America	26	4	-84.62	16	4	-75.00
Saint Pierre and Miquelon	26	4	-84.62	16	4	-75.00
Oceania	3 255	2 953	-9.28	2 698	2 505	-7.15
Fiji	1 066	1 034	-3.00	692	650	-6.07
Kiribati	104	85	-18.27	104	85	-18.27
Marshall Islands	731	653	-10.67	726	646	-11.02
Micronesia	103	112	8.74	103	112	8.74
Nauru	51	72	41.18	51	72	41.18
Palau	63	78	23.81	63	78	23.81
Samoa	180	151	-16.11	171	150	-12.28
Solomon Islands	447	390	-12.75	446	390	-12.56
Tonga	204	163	-20.10	178	160	-10.11
Tuvalu	23	22	-4.35	23	22	-4.35
Vanuatu	283	193	-31.80	141	140	-0.71

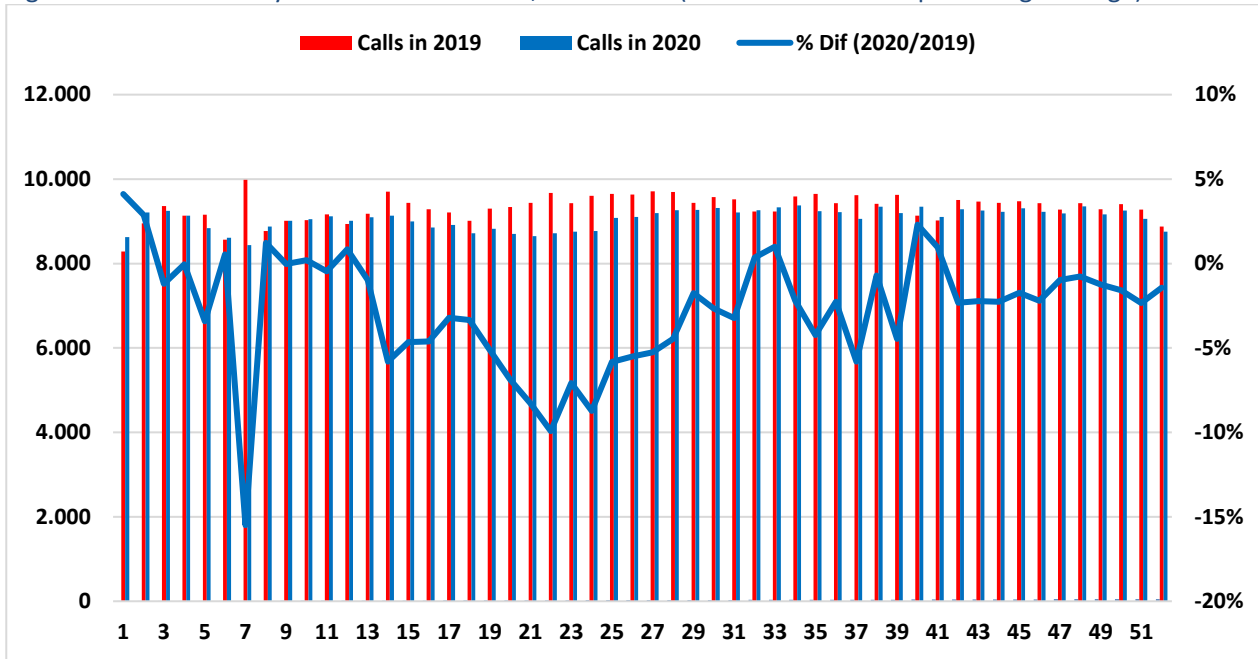
Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Vessel calls by shipping market

Container vessel calls

With carriers introducing a series of blank sailings, the number of container vessels declined in the first half of 2020 (Figure 11:). Blank sailings can serve as a leading indicator of changes in demand. In recent years a correlation between blanked capacity (i.e. services cancelled and port calls skipped) and actual drop in demand has been observed, as carriers have become better at capacity management. However, following the initial shock inflicted by the pandemic, in at least half of the container ports around the globe the sector demonstrated a rapid adaptation to the new conditions and container vessel calls progressively approached the pre-COVID levels. Overall, container vessel calls were -2.8 per cent lower in 2020 compared with the previous year.

Figure 11: Global weekly container vessel calls, 2019–2020 (number of calls and percentage change)

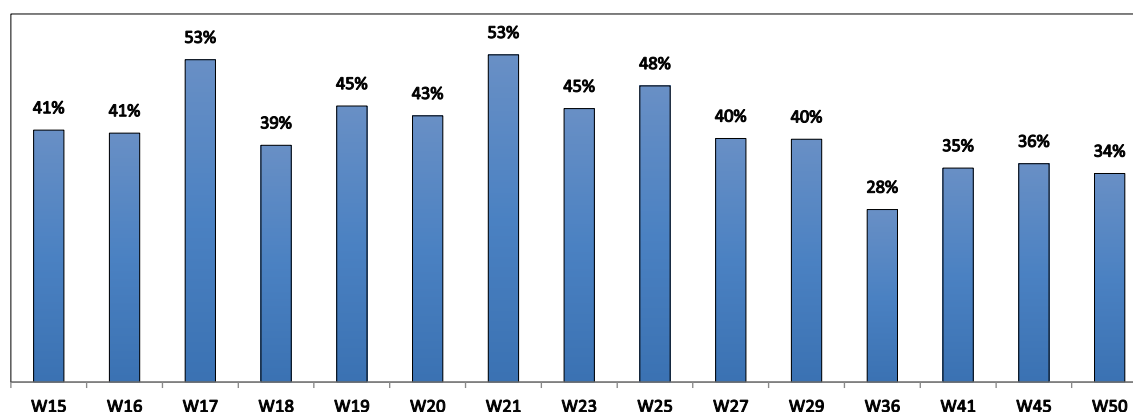


Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

The COVID-19 Port Economic Impact Barometer, developed by the International Association of Ports and Harbors (IAPH), with contributions from over 100 ports, reveals that at a global level starting in week 12 of 2020 (when WHO declared COVID-19 a pandemic), about 45 per cent of the ports faced a drop of more than –5 per cent in container vessel calls compared with normal conditions (Figure 12:). In April and May 2020, main ports saw less containers being discharged during a given ship call. Some service providers used smaller vessels since cargo volumes had decreased. As a result, regional feeder services increased. On a global scale, up to 11 per cent of ports witnessed a decline in container vessel calls of more than 25 per cent. The situation slightly improved after week 21, when the negative impact was at its peak.

Consequently, most world container ports recorded negative growth throughput figures in the first half of 2020. Empirical evidence suggests that the largest world ports, i.e. those handling more than 10 million twenty-foot equivalent units (TEUs) per year, experienced on average a smaller throughput decline (–4 per cent) than ports handling 3 million–10 million TEUs per year (–10 per cent) (Notteboom et al., 2021). Worst performers among the large Asian container hubs in the first half of 2020 were Dalian (–31 per cent), Shenzhen (–10.8 per cent), Port Klang (–9.3 per cent), Shanghai (–6.9 per cent) and Kaohsiung (–6.8 per cent). On the other hand, Tianjin (+2.9 per cent), Qingdao (+0.3 per cent), Singapore (–1.1 per cent), Busan (–1.1 per cent), and Guangzhou (–1.6 per cent) were among the least affected. As to North American ports, all the top 10 recorded negative growth. Seattle Tacoma (–18.3 per cent), Los Angeles (–17.1 per cent) and Norfolk (–12.4 per cent) saw double-digit rates of decline. In Europe, the port of Antwerp was the only large gateway port that was able to maintain volumes (+0.4 per cent in 2020 compared with 2019). Algeciras and Bremerhaven recorded a relatively modest decline, while others such as Le Havre and Barcelona saw their TEU throughput drop by more than 20 per cent.

Figure 12: Container shipping, 2020 (percentage of ports affected by blank sailings)



Source: Notteboom and Pallis (2021).

Variations in throughput performance also reflect local conditions. For many shippers and forwarders, the pickup of import cargo from the port was particularly challenging due to hinterland transport limitations (Notteboom et al., 2021). This was mainly due to border crossing complications caused by new measures or shortage of truck drivers and temporary suspension of road, rail and barge services. Port cargo traffic was further maintained by shipping lines using some of the world's leading trans-shipment hubs (such as Bremerhaven, Busan, Panama, and the like) to serve as advance yard storage. The aim was to convince shippers to begin moving goods early in anticipation of a demand recovery (see below). Therefore, shipping lines contributed to the system's resilience by offering flexible storage solutions to shippers that minimized booking cancellations and helped to limit congestion in ports of discharge. In addition to improving efficiency, products were placed closer to distribution networks. At the same time, in some cases blank sailings combined with the use of large vessels, meaning less frequent calls but larger volumes to handle at once when a vessel calls at a port. This was particularly the case in large container ports. Port calls by ultra-large container ships may have declined in frequency but not in cargo size, as these megaships carry higher volumes. Irrespective of the challenges to ports and inland carriers as less frequent calls were associated with larger call exchanges,⁹ the resulting overall container volumes were less affected.

As the recovery started in late 2020, container vessels started calling in most ports around the globe. Along with a growing demand, the scheduled vessels started unloading more goods per call, and before the end of 2020 several container ports and terminals started to face congestion, a situation that amplified in 2021 and 2022. Table 7 indicates trends in container vessel calls by quarter. The patterns reflect the pandemic waves and its asynchronous spread across geographical regions. For countries and regions distant from China, the effects became more visible in Q2 of 2020. The negative trend in Europe peaked in Q2 2020 (-12.3 per cent), remained substantial throughout Q3 (-6.5 per cent), and was almost reversed in Q4 2020. In North America, the full impact of COVID-19 was felt during Q2 2020 (-9.6 per cent). The situation started to improve in the second half of the year. Trends in Africa matched those in North America; negative trends also lasted one quarter (Q2 2020) with a speedy recovery during Q3 and the return of vessel calls to 2019 levels in Q4 2020. However, the drop in vessel calls in Africa was lower compared with consuming markets of Europe and North America. Asia saw a minor decrease in Q2 2020 (-3.2 per cent), before improving in the remaining quarters. Meanwhile, the LAC region saw its container vessel calls drop much later compared with other regions.

⁹ Indicative is the new "world record" registered by the Port of Los Angeles. The port recorded the largest number of container movements during a single ship call. This occurred in late June 2020 as the port reported that longshoremen successfully moved 18,465 containers from the MSC *Isabella* during a single ship call at APM Terminals Pier 400 (Port of Los Angeles (2020)).

Oceania was the hardest hit. Lower container ship capacity deployed in the region was evident from the beginning of 2020. As a result, container vessel calls declined by –12 per cent in 2020 compared with 2019, with a double-digit percentage decline recorded even in the second half of 2020 when all other economies were experiencing a reversing situation.

Table 7: Quarterly container vessel calls by region, 2019–2020 (percentage change and number of calls)

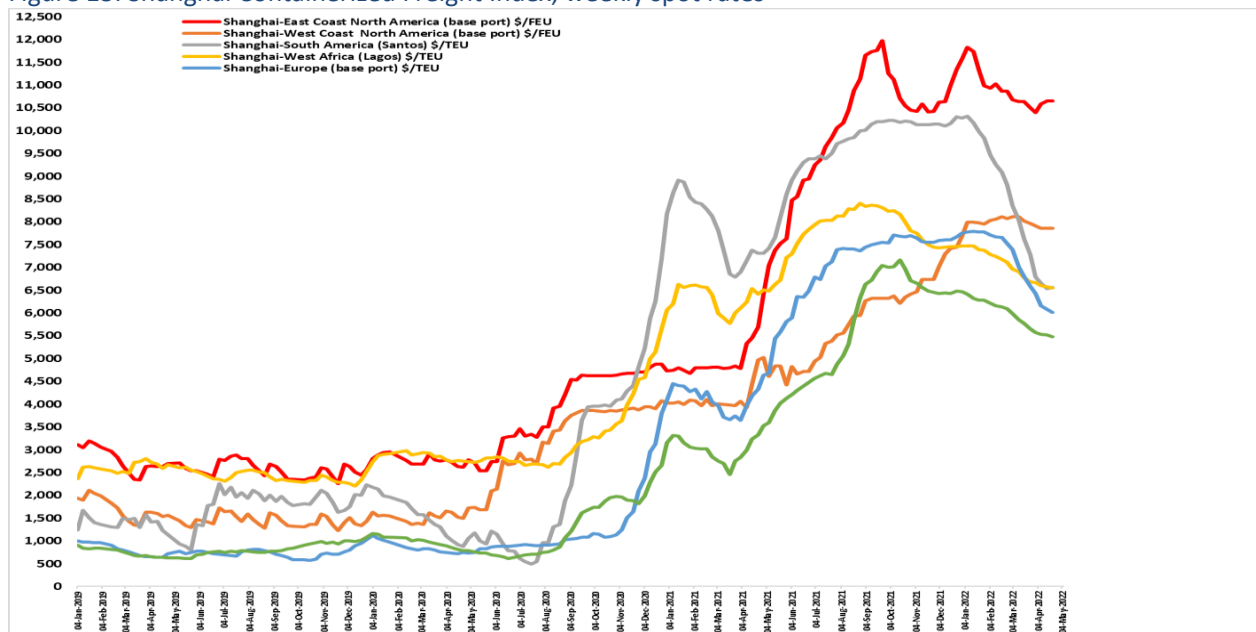
	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	30 157	281 037	95 823	45 926	22 140	9 875
Calls 2020	28 988	278 796	89 286	43 964	21 556	8 692
Total 2020 (Δ%)	-3.9	-0.8	-6.8	-4.3	-2.6	-12.0
Q1 (Δ%)	-4.7	2.9	-6.9	-4.1	-6.5	-13.1
Q2 (Δ%)	-9.9	-3.2	-12.3	-5.2	-9.6	-11.5
Q3 (Δ%)	-1.3	-1.1	-6.5	-8.3	-0.7	-9.9
Q4 (Δ%)	-0.1	-1.6	-1.6	0.7	5.7	-13.5

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Initial expectations were that maritime trade, including containerized trade, would suffer a substantial downturn (UNCTAD, 2020a). However, the reopening of the economies and the increased demand that accompanied it led to the restoration of demand for containerized maritime services. Easing out of lockdowns in many consumption markets unleashed a pent-up demand as of Q3 2020, while stimulus packages supporting consumer demand, especially in the United States, and front-loading in anticipation of new pandemic waves as well as inventory-building contributed to helping containerized trade flows. However, the higher-than-expected demand was not met by a sufficient supply of shipping capacity. Empty containers to move Chinese exports to overseas destinations became unavailable, as they were left in places where they were not needed, and the repositioning had not been planned for. Congestion reduced the velocity of containers and had a contagion effect on other shipping routes as container scarcity increased rates irrespective of whether shipping capacity was fully used. As carriers skipped port calls, the mismatch between demand and supply of empty containers was exacerbated as empty containers were left behind and failed to be repositioned. The “lack of containers” crisis also reflected a slowdown across the supply chain due to bottlenecks resulting from port workers testing positive for COVID-19, inland transport operators (trucks and other intermodal connections) undergoing necessary testing, and factories delaying the return of containers. These factors meant that container dwell times increased further, and empty containers could not return to the system where they were most needed (UNCTAD, 2021d). Empty container scarcity implies that an importer must pay not only for the transport of the full import containers but also for the inventory holding cost of the empty box itself; furthermore, the lack of return cargo meant that it was costly for carriers to ship empty containers back to China.

All these factors combined led to increased freight rates for transporting containers as well as to increased operating profits for both shipping lines and port terminal operators (Notteboom et al., 2021). Container freight rates reached historic heights from August 2020 (figure 13). The surge in freight rates that spread across developing regions, such as Africa and Latin America, outpaced that observed on the main East–West routes. The early 2021 peak freight rates were higher on all routes. The lowest relative increase in freight rates was recorded on the Asia–East Coast North America (63 per cent). In comparison, freight rates from China to Latin America were 443 per cent higher than the median for that route.

Figure 13: Shanghai Containerized Freight Index, weekly spot rates



Source: UNCTAD, based on data from Clarksons Shipping Intelligence Network.
 Note: Period: 4 January 2019 to 6 May 2022.

Strong market consolidation, particularly the 2014–2017 mergers and acquisition wave, together with improved capacity management and a fast bounceback in demand post-lockdown can help explain the sharp contrast with the situation during the 2008/09 global financial crisis. Unlike the financial crisis, container freight rates surged. Despite the disruption, most liner shipping companies enjoyed greater profitability. This was further facilitated by sharing slots on vessels, a stagnant orderbook, returns of chartered tonnage to lessors, low bunker fuel prices, and, to a certain extent, the lack of regulations allowing liner shipping lines to manage and control capacity.

Container vessel calls by type of economy

Trends in container vessel calls by economy type (table 8) indicate that developed economies recorded the largest declines (–5.2 per cent) in 2020. Developing countries were comparatively less affected (–1.6 per cent), as were LDCs (–2.6 per cent). Economies in transition experienced their own distinct trend, as the strong growth of Q4 (9.1 per cent) partially erased the slump experienced during first nine months of 2020. In 2020, total container vessel calls in SIDS were just nine calls lower than the previous year. However, as the quarterly breakdown of this aggregate reveals, the initial stages of the pandemic had a more significant impact on vessel calls.

Table 8: Quarterly container vessel calls by economy type, 2019–2020 (number of calls and percentage change)

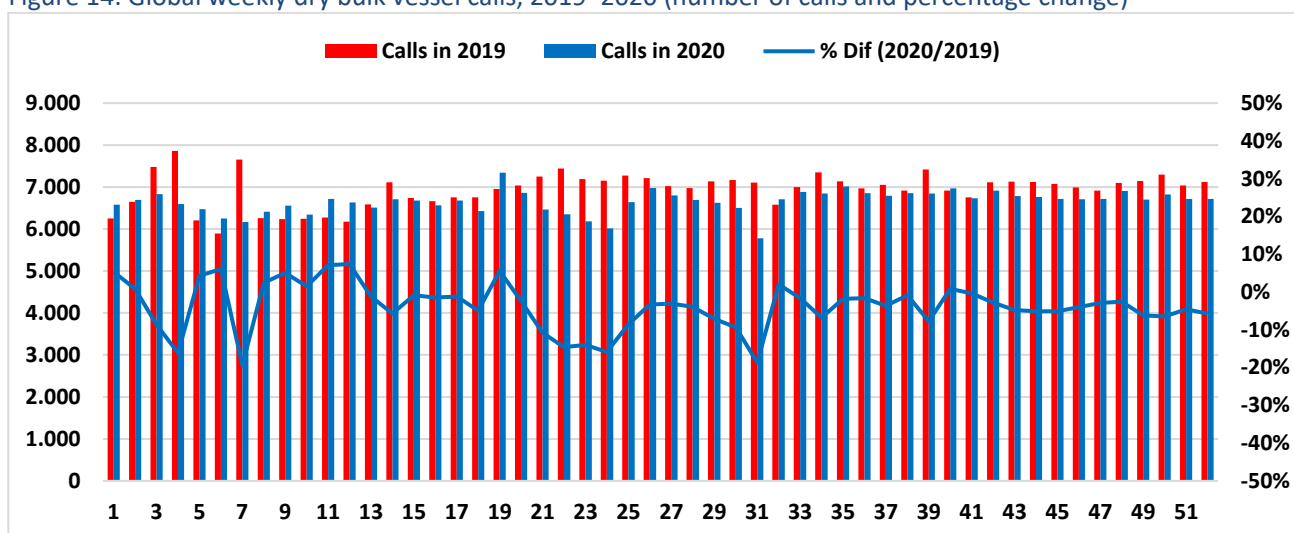
	Developed	Developing	LDCs	Transition	SIDS
Calls 2019	157 796	312 192	9 321	5 649	6 334
Calls 2020	149 581	307 174	9 056	5 471	6 325
Total 2020 (Δ%)	-5.2	-1.6	-2.8	-3.2	-0.1
Q1 (%)	-5.1	1.1	0.1	-6.5	3.4
Q2 (%)	-8.7	-4.9	-3.2	-9.0	2.5
Q3 (%)	-5.2	-1.8	-5.5	-6.0	-2.0
Q4 (%)	-2.0	-1.0	-2.6	9.1	-4.3

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Bulk, breakbulk and Ro-Ro vessel calls

The number of dry bulk vessel calls around the globe declined in 2020 at a rate equivalent to that of container vessels. The aggregate number of calls stood at -4.1 per cent compared with the year before (figure 14). Following a weak first quarter, when the number of dry bulk vessels was -1.2 per cent lower than the same period in 2019, the decline reached its peak in Q2 (-6 per cent) and Q3 (-5.3 per cent). An improvement was recorded in Q4 2020 bringing dry bulk shipping market closer to its pre-pandemic levels (-3.9 per cent). Following the initial shock, dry bulk operations were only moderately impacted by the pandemic.

Figure 14: Global weekly dry bulk vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Trends in dry bulk shipping mirrored, to some extent, those observed in container shipping (table 9). The negative effect was more pronounced in Europe (-9.5 per cent), followed by the LAC region (-8.6 per cent) and Oceania (-6.3 per cent). In Europe, the decline was observed in Q2 2020 (-15.2 per cent). Trends in North America followed a similar pattern, with a significant difference lying in the recovery observed in North American during Q4 (6.2 per cent). Meanwhile, Europe continued to record drops in dry bulk vessel calls (-9.3 per cent). The impact was less dramatic on dry bulk vessel calls in Africa and Asia.

Table 9: Quarterly dry bulk vessel calls by region, 2020 (percentage change and number of calls)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	360 883	23 250	199 880	47 225	37 912	32 354	20 262
Calls 2020	346 065	22 114	197 090	42 745	34 663	30 476	18 977
Total 2020 (Δ%)	-4.1	-4.9	-1.4	-9.5	-8.6	-5.8	-6.3
Q1 (Δ%)	-1.2	-7.4	8.0	-7.8	-15.4	-12.1	-19.1
Q2 (Δ%)	-6.0	-6.1	-5.2	-15.2	0.5	-8.7	1.5
Q3 (Δ%)	-5.3	-2.6	-3.5	-7.3	-9.0	-10.6	-5.5
Q4 (Δ%)	-3.9	-3.6	-4.1	-8.1	-9.3	6.2	0.5

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

In contrast to the containerized trade segment, countries with economies in transition and LDCs experienced the steepest declines in bulker vessel calls with -10.8 and -12.8 per cent, respectively. Developed and developing countries registered port call declines of -7 and -2.3 per cent, respectively (table 10). Dry bulk vessel calls observed in the last quarter of 2020 highlighted the nascent recovery across all country groupings.

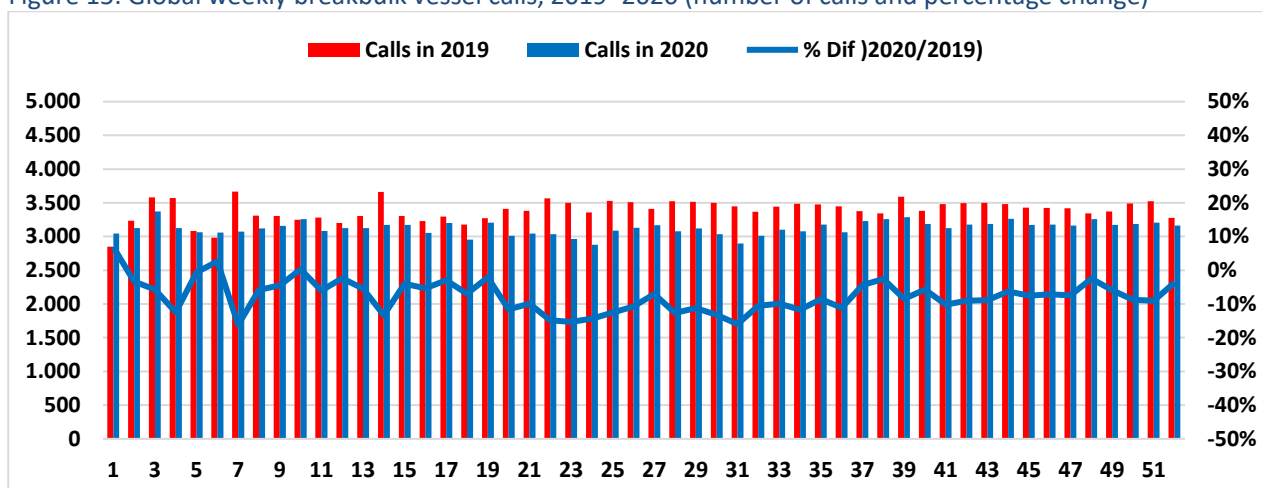
Table 10: Quarterly dry bulk vessel calls by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	Total
Calls 2019	107 706	232 928	7 502	12 747	2 674
Calls 2020	100 154	227 503	7 034	11 374	1 832
Total 2020 (Δ%)	-7.0	-2.3	-6.2	-10.8	-31.5
Q1 (Δ%)	-4.7	2.5	-11.8	-26.1	-16.2
Q2 (Δ%)	-8.6	-4.4	-13.7	-7.4	-42.4
Q3 (Δ%)	-9.9	-3.3	-2.1	-5.3	-35.6
Q4 (Δ%)	-4.5	-3.9	3.3	-1.5	-34.5

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Calls by ships transporting breakbulk cargo fell by -7.8 per cent in 2020 compared with the previous year (figure 15). Breakbulk vessel calls declined by -9.4 per cent in Q2 of 2020 and by -10 per cent in Q3 of 2020. A slight improvement occurred during the last quarter (-7 per cent). As a result, the total number of vessel calls made by breakbulk carriers at ports worldwide in 2020 were below the 2019 level.

Figure 15: Global weekly breakbulk vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Oceania (-17.6 per cent), LAC (-14.8 per cent) and Europe (-10 per cent) recorded double-digit declines in breakbulk vessel calls within 2020 (table 11). The decline was less pronounced in Africa and Asia. Asia was the only continent that saw increased breakbulk vessel calls in early 2020. North America was less affected with vessel calls reducing by a marginal -1.3 per cent.

Table 11: Quarterly breakbulk vessel calls by region, 2019–2020 (number of calls and percentage)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	176 307	15 918	87 533	46 470	13 752	8 108	4 526
Calls 2020	162 592	14 604	82 712	41 830	11 711	8 007	3 728
Total 2020 (Δ%)	-7.8	-8.3	-5.5	-10.0	-14.8	-1.3	-17.6
Q1 (Δ%)	-4.4	-8.6	5.0	-12.2	-19.3	-8.1	-19.5
Q2 (Δ%)	-9.4	-8.8	-5.4	-15.8	-16.4	-2.0	-15.1
Q3 (Δ%)	-10.0	-6.7	-10.0	-11.6	-9.7	-4.1	-19.3
Q4 (Δ%)	-7.0	-9.0	-10.2	-0.3	-13.7	7.9	-16.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

The impact was more significant in developed economies (table 12). Breakbulk vessel calls fell by -9.4 per cent in 2020 over the previous year. While calls in developing economies were reduced by -8.0 per cent, the economies in transition registered a decline of -3.4 per cent, reflecting in particular the strong rebound (11 per cent) in breakbulk vessels activity in Q4. LDCs have remained totally unaffected, as the number of breakbulk vessels remained dynamic throughout the first half of 2020 and most of the second half of the year. As a result, these countries recorded an increase in breakbulk vessel calls in 2020 (6.1 per cent).

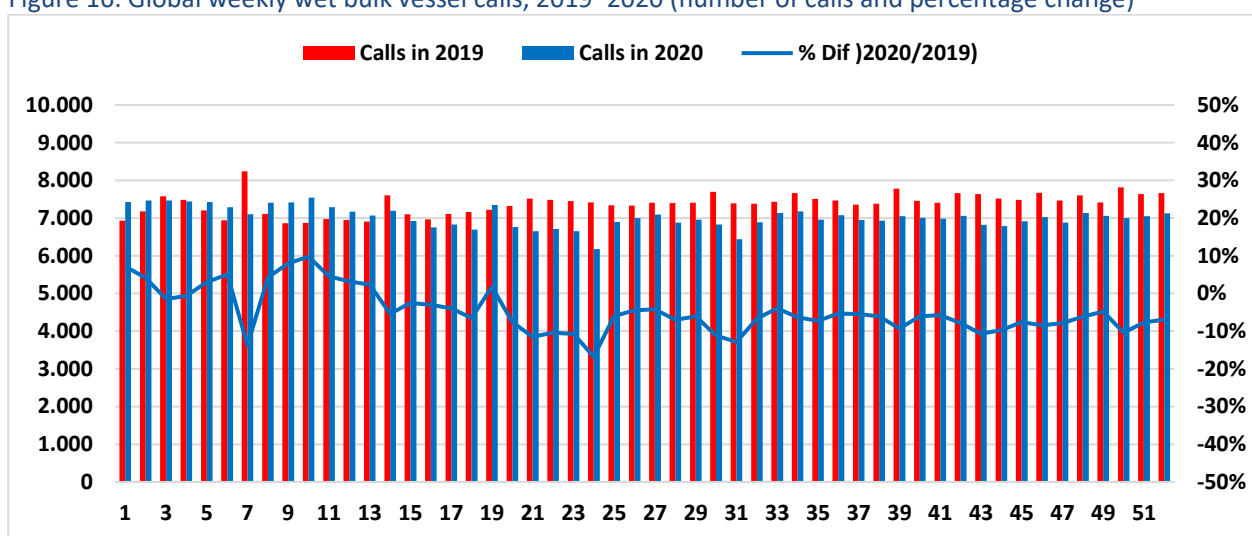
Table 12: Quarterly breakbulk vessel calls by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	Total
Calls 2019	64 363	97 377	6 470	8 097	3 155
Calls 2020	58 303	89 604	6 825	7 820	2 640
Total 2020 (Δ%)	-9.4	-8.0	6.1	-3.4	-16.3
Q1 (Δ%)	-8.7	-1.3	8.8	-17.4	-13.1
Q2 (Δ%)	-12.0	-9.3	11.7	-6.2	-29.3
Q3 (Δ%)	-12.7	-9.4	-2.6	-2.8	-15.6
Q4 (Δ%)	-4.1	-11.5	6.8	11.0	-8.6

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

In line with developments in dry bulk shipping, port calls by ships carrying wet bulk cargo also declined in 2020 (figure 16). While at the beginning of the year, wet bulk carriers were serving global maritime flows at a greater frequency than the year before (Q1 2020, up 2.3 per cent), amid the pandemic, trends were reversed. Vessel calls by wet bulk carriers fell by -6.7 per cent in Q2 of 2020 as compared with the equivalent period in 2019. This pattern continued during the remaining part of the year. There were no signs of recovery and total vessel calls by wet cargo carriers dropped by about -5 per cent in 2020 over the previous year.

Figure 16: Global weekly wet bulk vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

In 2020, Africa and Oceania fared relatively better than other regions as they recorded declines of -2.8 and -0.6 per cent, respectively in wet bulk vessel calls. In Asia, which receives half of the annual port calls, North America and LAC, wet bulk vessel calls were markedly less in 2020 compared with 2019 (table 13). The decline in North America was significant, followed by LAC and Europe.

Table 13: Quarterly wet bulk vessel calls by region, 2019–2020 (percentage change and number of calls)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	383 918	24 444	178 785	96 501	42 435	35 986	5 767
Calls 2020	365 314	23 755	175 498	90 245	38 178	31 907	5 731
Total 2020 (Δ%)	-4.9	-2.8	-1.8	-6.5	-10.0	-11.3	-0.6
Q1 (Δ%)	2.3	1.6	9.0	0.4	-11.8	-3.0	-7.8
Q2 (Δ%)	-6.7	2.3	-5.9	-6.9	-10.0	-14.9	12.3
Q3 (Δ%)	-7.0	-7.4	-2.8	-11.4	-10.3	-14.2	2.0
Q4 (Δ%)	-7.7	-6.8	-7.0	-7.6	-7.8	-12.8	-5.9

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Developed economies (-7.2 per cent) and the economies in transition (-10.4 per cent) experienced the largest decline since the pandemic was declared. Wet bulk vessel calls in developing country ports declined by -3.4 per cent while in the LDCs calls increased by 4.5 per cent (table 14).

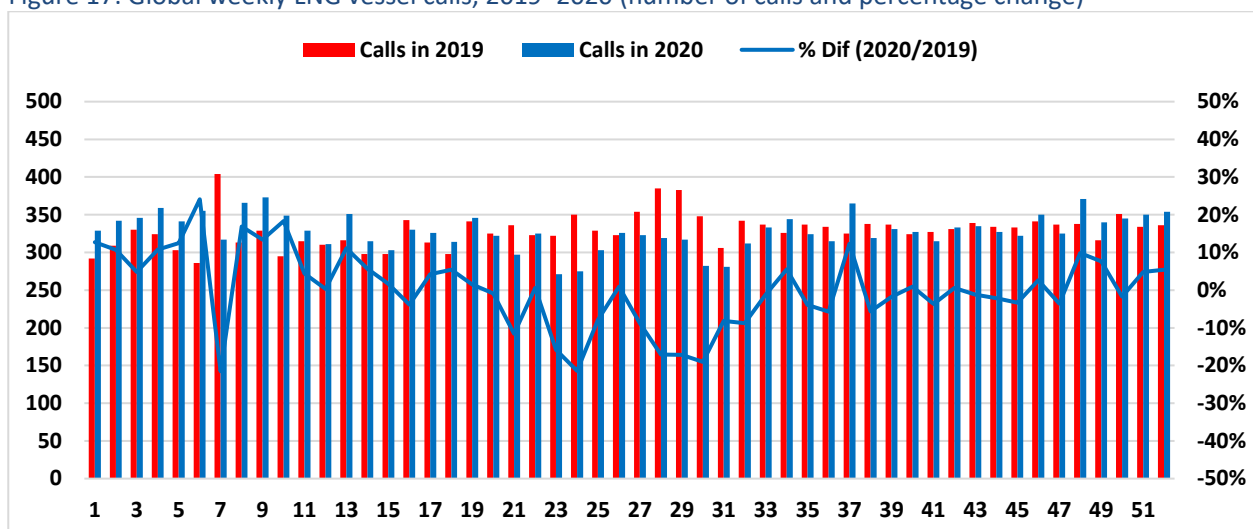
Table 14: Quarterly wet bulk vessel calls by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	SIDS
Calls 2019	121 836	22 508	7 221	13 749	5 688
Calls 2020	131 294	230 364	6 908	15 352	5 375
Total 2020 (Δ%)	-7.2	-3.4	4.5	-10.4	-5.5
Q1 (Δ%)	0.7	4.1	-2.7	-6.6	7.0
Q2 (Δ%)	-8.5	-6.3	17.3	-7.6	-10.9
Q3 (Δ%)	-11.2	-4.2	2.4	-17.0	-3.9
Q4 (Δ%)	-9.4	-7.0	3.2	-9.6	-15.2

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

At the global level the pandemic's impact on LNG- and LPG-carrying vessels has been minor, with LNG carrier calls just 100 lower, or -0.22 per cent, than 2019 levels (figure 17). Calls by LNG carriers increased by 8.3 per cent in Q1 2020 as compared with Q1 2019; however, the pandemic upended this trend before a nascent recovery was observed in Q4, with LNG-carrying vessels increasing their calls by 1.2 per cent compared with Q4 2019.

Figure 17: Global weekly LNG vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Trends in the relatively small LNG shipping market reveal some regional variations as regards the level of disruption (table 15). LNG vessels had a good start in 2020, reflecting the increased traffic in North America and Europe and a stable situation in Asia. The latter region is where about half of the global annual LNG vessel calls occur. Oceania was heavily affected with consecutive two-digit declines during Q2 and Q3 2020 (–11.1 and –10.8 per cent, respectively). Europe (–4.9 per cent) is another region that recorded an annual drop in LNG vessel calls during the period. North America saw a 19.9 per cent growth in LNG vessel calls despite the negative performance of Q3.

Table 15: Quarterly LNG vessel calls by region, 2019–2020 (number of calls and percentage change)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	17 118	1 687	8 242	3 739	943	958	1 549
Calls 2020	17 080	1 603	8 336	3 566	973	1 149	1 453
Total 2020 (Δ%)	-0.2	-5.0	1.1	-4.6	3.2	19.9	-6.2
Q1 (Δ%)	8.3	9.1	0.0	25.6	-13.4	51.4	-0.8
Q2 (Δ%)	-3.1	0.0	-3.3	-2.7	-7.3	10.6	-11.1
Q3 (Δ%)	-6.6	-10.3	-2.5	-14.6	14.1	-23.4	-10.8
Q4 (Δ%)	1.2	-15.7	10.5	-21.9	17.3	36.6	-1.8

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Despite the negative trends of Q2 and Q3 2020, over the full year LNG vessel calls increased by 1.1 per cent in developing economies. In contrast, LNG vessel calls declined in developed economies (table 16). While the economies in transition (3.9 per cent) and even more so, the LDCs (32.2 per cent) handle a relatively smaller number of LNG vessel calls, they both saw their LNG vessel calls increase in 2020 despite the disruption caused by the pandemic.

Table 16: Quarterly LNG vessels by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	SIDS
Calls 2019	6 969	9 518	90	541	677
Calls 2020	6 772	9 627	119	562	557
Total 2020 (Δ%)	-2.8	1.1	32.2	3.9	-17.7
Q1 (Δ%)	15.2	2.9	-31.2	18.5	-18.5
Q2 (Δ%)	-5.2	-2.0	-5.0	4.0	-16.1
Q3 (Δ%)	-14.0	-2.4	90.0	-7.8	-11.5
Q4 (Δ%)	-6.9	6.7	122.2	2.7	-25.0

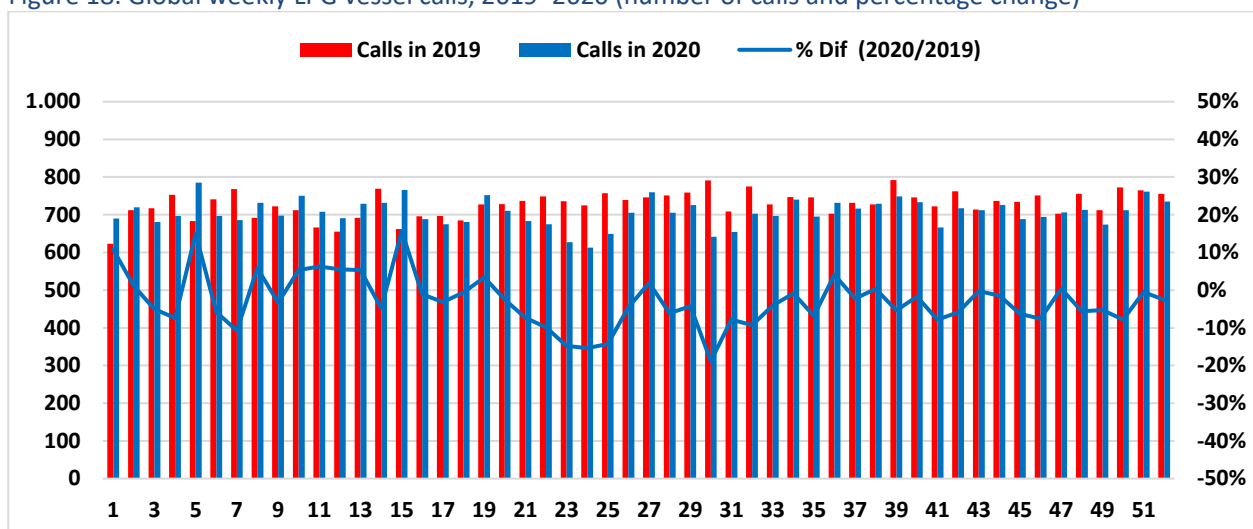
Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Global port calls by LPG vessels had a good start in the early weeks of 2020 (up 1.4 per cent) (table 17). However, the gains achieved evaporated with the onset of COVID-19. Calls declined across the remaining three quarters. Despite the positive beginning before the outbreak of the pandemic, the total number of port calls made by LPG carriers was reduced by more than -3 per cent compared with 2019 (figure 18).

Trends in LPG vessel calls varied across regions (table 17). The smallest world LPG market, Oceania, recorded growth in its LPG vessel calls during Q1 2020. The arrival of the pandemic held back that growth despite the strong recovery of Q4 of 2020 (22.2 per cent). North America saw firm growth in LPG vessel calls during Q1 2020 (28.6 per cent) before decelerating in Q2 (1.4 per cent) and Q3 (5.3 per cent) and recovering (15.7 per cent) in Q4. The number of port calls by LPG vessels also increased throughout the year, with much of the growth occurring in the first half of 2020. LPG vessel calls in Asia and Europe exhibited different patterns. In 2020, these two major markets recorded less vessel calls by LPG carriers. In Asia, the biggest market, calls declined by -2.2 per cent in the full year, reflecting the contractions in Q1 through Q4. Similarly, Europe LPG vessel calls dipped by -11.6 per cent in 2020, reflecting the plunge after Q2 that intensified as the year progressed.

More than 60 per cent of global LPG vessel calls are located in developing countries, where the calls declined by an annual -1.8 per cent in 2020 (table 18). The decline started from the outbreak of the pandemic and intensified in Q3 (-3.5 per cent) and Q4 (-4.5 per cent). Another third of LPG vessel calls take place in developed countries where they fell by -8.3 per cent in Q2 and -9 per cent in Q3. The decline moderated in Q4 (-4.8 per cent). LPG vessel calls in the economies in transition slumped by -21.6 per cent in 2020, reflecting the double-digit declines observed over three quarters. LDCs, which account for a relatively small share of the world LPG vessel calls, recorded an increase of 17.5 per cent in 2020 and do not seem to have been affected by the disruption. However, in terms of absolute numbers, the change in the LPG vessel calls has been rather moderate.

Figure 18: Global weekly LPG vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 17: Quarterly LPG vessel calls by region, 2019–2020 (number of calls and percentage change)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	37 876	3 938	16 219	10 514	4 352	2 485	368
Calls 2020	36 705	4 232	15 854	9 299	4 121	2 788	411
Total 2020 (Δ%)	-3.1	7.5	-2.2	-11.6	-5.3	12.2	11.7
Q1 (Δ%)	1.4	13.2	6.3	-7.8	-16.5	28.6	19.0
Q2 (Δ%)	-4.0	11.8	-2.8	-12.0	-6.1	1.4	3.4
Q3 (Δ%)	-5.4	4.1	-4.8	-14.9	-0.9	5.3	4.5
Q4 (Δ%)	-4.1	2.1	-6.7	-11.3	3.6	15.7	22.2

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

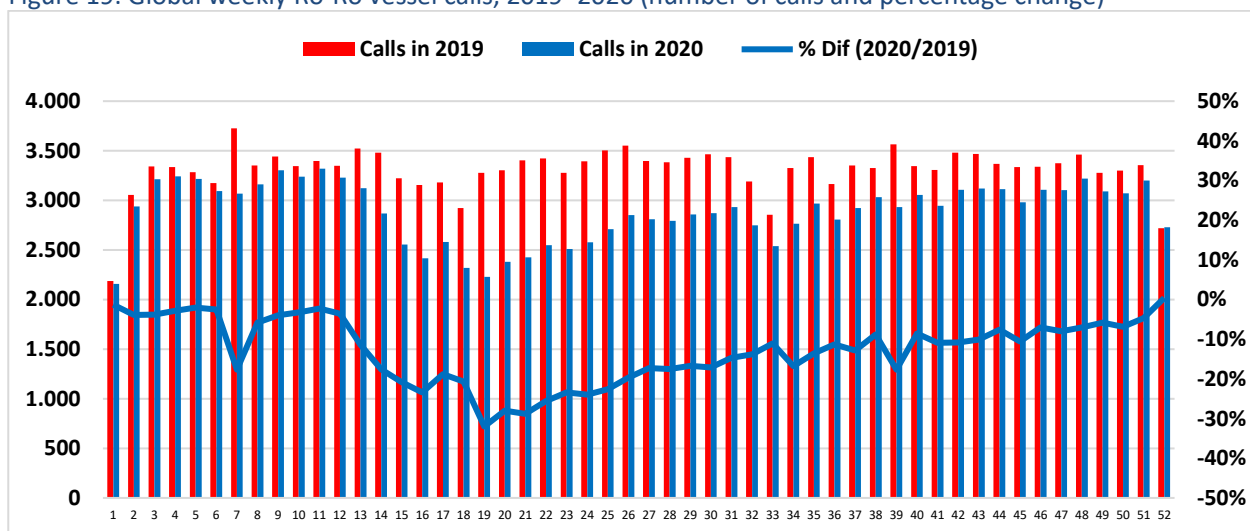
Table 18: Quarterly LPG vessel calls by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	SIDS
Calls 2019	13 764	22 639	778	695	691
Calls 2020	13 009	22 237	914	545	601
Total 2020 (Δ%)	-5.5	-1.8	17.5	-21.6	-13.0
Q1 (Δ%)	0.4	2.9	-6.0	-18.6	18.4
Q2 (Δ%)	-8.3	-1.5	36.6	-31.2	-27.3
Q3 (Δ%)	-9.0	-3.5	21.1	-24.6	-15.3
Q4 (Δ%)	-4.8	-4.5	26.5	-9.2	-22.2

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

The COVID-19 pandemic significantly impacted Ro-Ro shipping (figure 19). Total port calls by Ro-Ro vessels dropped by -12.8 per cent in 2020 compared with the previous year. In Q2 of 2020 alone, one in four vessels was suspended as shown by the double-digit decline of -23.6 per cent. The situation started to improve in Q3 (-15.2 per cent) and Q4 (-7.6 per cent) as economies began reopening. During the last weeks of 2020, a total return to pre-pandemic levels was observed in world Ro-Ro vessel calls, indicating the start of a recovery.

Figure 19: Global weekly Ro-Ro vessel calls, 2019–2020 (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Drops in Ro-Ro vessel calls occurred across regions (table 19). Developing economies saw a -28.8 per cent decline in Ro-Ro vessel calls in Q2 and -27.3 per cent in Q3 2020. In developed countries these vessel calls also declined during both quarters (-22.6 per cent in Q2 and -10.6 per cent in Q3). Trends between these two groupings had diverged by the end of year, with developed countries recording a vessel call drop of -3.2 per cent as compared with -18.8 per cent in developing ones. The decline in Ro-Ro vessel calls in the LDCs reached double-digit levels in Q1 and Q2 2020 (-13.8 and -11.2 per cent, respectively) but improved during the second half of the year. Trends were more volatile in the economies in transition, with Ro-Ro vessel calls falling by -5.3 per cent during the year, reflecting the mitigating effect of the positive trends observed in Q2 (table 20).

Table 19: Quarterly Ro-Ro vessel calls by region, 2019–2020 (percentage change and number of vessels)

	Total	Africa	Asia	Europe	LAC	North America	Oceania
Calls 2019	172 055	8 660	60 966	80 836	9 604	8 380	3 609
Calls 2020	150 087	7 086	53 051	71 931	7 994	6 889	3 136
Total 2020 (Δ%)	-12.8	-18.2	-13.0	-11.0	-16.8	-17.8	-13.1
Q1 (Δ%)	-5.2	-11.5	-2.6	-4.4	-10.0	-12.2	-5.2
Q2 (Δ%)	-23.6	-35.3	-20.1	-23.7	-22.0	-37.3	-23.6
Q3 (Δ%)	-15.2	-17.6	-18.9	-10.7	-24.7	-18.5	-14.6
Q4 (Δ%)	-7.6	-9.3	-10.0	-6.0	-10.3	-4.3	-7.6

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 20: Quarterly Ro-Ro vessels by economy type, 2019–2020 (number of calls and percentage change)

	Developed	Developing	LDCs	Transition	SIDS
Calls 2019	118 449	48 168	1 944	3 494	972
Calls 2020	107 014	37 910	1 855	3 308	891
Total 2020 (Δ%)	-9.7	-21.3	-4.6	-5.3	-8.33
Q1 (Δ%)	-2.9	-10.0	-13.8	-13.0	-7.4
Q2 (Δ%)	-22.6	-28.8	-11.2	14.8	-1.4
Q3 (Δ%)	-10.6	-27.3	-0.6	-12.3	-14.2
Q4 (Δ%)	-3.2	-18.8	7.4	-6.0	-9.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Liner shipping connectivity

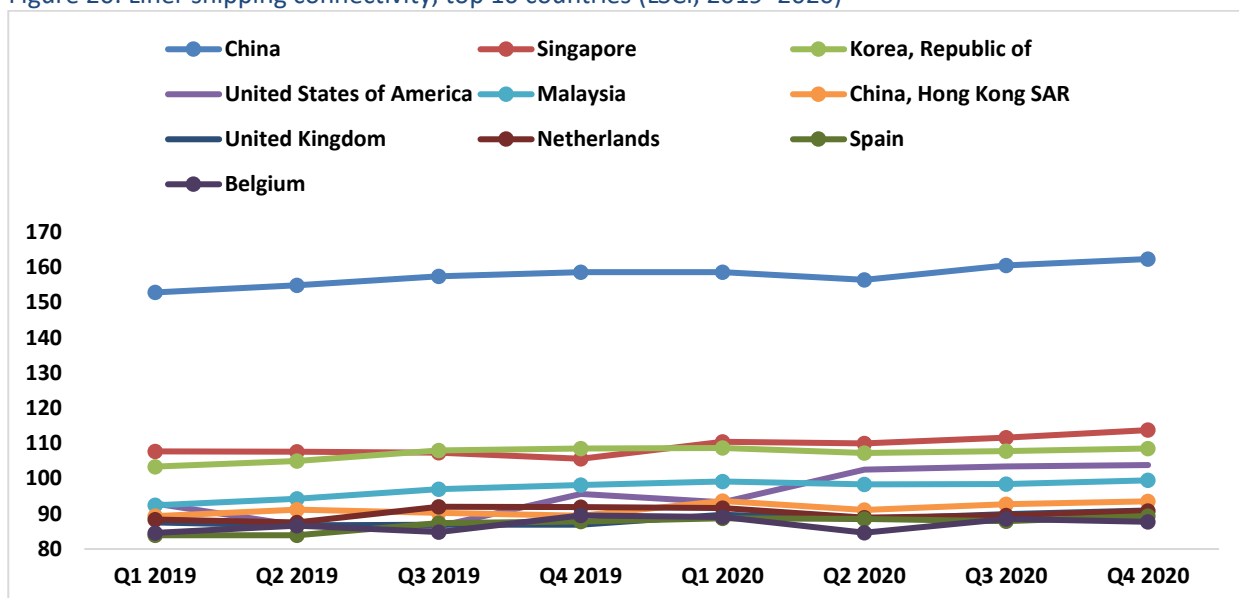
Countries with better liner shipping connectivity, as reflected in the UNCTAD Liner Shipping Connectivity Index (LSCI),¹⁰ generally have better access to overseas markets and so can be more competitive. Of the top 10 best-connected countries/territories by the end of 2020, five were in Asia and included China, Hong Kong (China), Malaysia, the Republic of Korea and Singapore, while the remaining five were Belgium, the Netherlands, Spain, the United States and the United Kingdom of Great Britain and Northern Ireland (figure 20).

Six of these top 10 best-connected countries/territories managed to improve their connectivity levels in 2020. Singapore and the United States recorded the largest improvements. China, Hong Kong (China), and the United Kingdom saw similar levels of connectivity increases. Malaysia saw a limited increase in its connectivity, while the LSCI of the Republic of Korea remained stable. The Netherlands and Belgium saw a marginally lower LSCI by end 2020 compared with the equivalent period in 2019.

¹⁰ UNCTAD developed the LSCI in 2004. In 2019, the LSCI was updated and improved, comprising additional country coverage including several SIDS, and incorporating one additional component, covering (a) the number of countries that can be reached without the need for trans-shipment; the remaining five components, notably (b) the number of companies that provide services, (c) the number of services, (d) the number of ships that call per month, (e) the total annualized deployed container carrying capacity, and (f) ship sizes, have remained unchanged. Applying the same methodology as for the country-level LSCI, UNCTAD has generated a new port LSCI.

Of the 25 least connected economies/territories at the end of 2020, 19 were islands.¹¹ For Cabo Verde, the Cook Islands, Palau, Saint Kitts and Nevis, and Tuvalu, the pandemic undermined their connectivity level. The remaining SIDS maintained their connectivity levels throughout the year.

Figure 20: Liner shipping connectivity, top 10 countries (LSCI, 2019–2020)

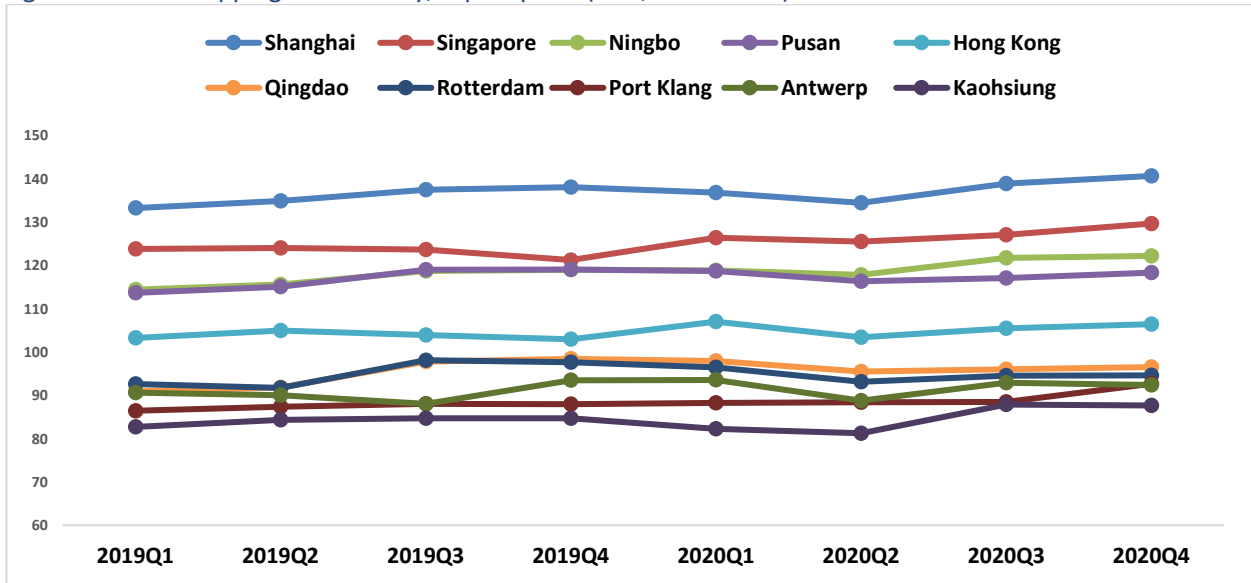


Source: UNCTAD, based on data provided by MDS Transmodal (2021). For the complete data set for all countries see <http://stats.unctad.org/LSCI>.

All in all, the pandemic widened the liner shipping connectivity divide. This is further illustrated when considering the top best-connected ports of the world (figure 21). Despite the pandemic, 8 of the top 10 improved their connectivity levels in 2020.

¹¹ These are Anguilla; Antigua and Barbuda; Bermuda; Bonaire; Cabo Verde; Cayman Islands; Christmas Island; the Cook Islands; Micronesia; Montserrat; Niue; Norfolk Island; Palau; Saint Kitts and Nevis; Sao Tome and Principe; Sint Eustatius and Saba; Timor-Leste; the Turks and Caicos Islands; and Tuvalu.

Figure 21: Liner shipping connectivity, top 10 ports (LSCI, 2019–2020)



Source: UNCTAD, based on data provided by MDS Transmodal (2021). For the complete data set for all countries see <http://stats.unctad.org/LSCI>.

An observed trend is the continued deployment of larger vessels. In 2020, the number of weekly calls, number of direct connections, and number of container services offered in LAC countries were reduced. The decline was at the scale of approximately one to two per cent. However, the decline was offset by an increase in the overall deployed capacity of container-carrying vessels (in TEUs). A similar trend was observed in Asia. The total number of weekly calls, number of operators, and number of direct calls decreased. However, increased deployed capacity in 2020 compensated for the reduction in the number of services and calls. In Africa, developments in the liner shipping connectivity per port were mixed, with many ports seeing their liner shipping connectivity improve while others recorded some deterioration. In line with the general trends, improved connectivity reflected increases in the maximum ship capacity deployed (15.5 per cent) in 2020 while other LSCI components declined.

Local disruptions with global implications

Disruptions at major world ports due to the pandemic, especially in the exporting Asian ports, were local phenomena with global consequences. Shanghai and Ningbo–Zhoushan provide illustrative examples. When unprecedented volumes of tankers, bulk carriers, and container ships remained idle due to a combination of increased COVID-19 cases and extreme weather at two of the largest ports in the world in terms of tons handled, havoc was created further along supply chains. The disruptions at Ningbo–Zhoushan alone had substantial ripple effects on global trade because the port operates 260 container shipping routes, including over 100 routes servicing the Belt and Road Initiative. When the situation started improving and exports resumed, officials limited the number of days containers could arrive at the port before their scheduled departure, with shipping lines claiming efforts to mitigate the impact on their clients’ supply chains where possible. Faced with terminal congestion, vessel delays, the prospects of continuing backlogs, and uncertainties, all the major shipping companies and their alliances (including the Mediterranean Shipping Company (MSC), Maersk, Ocean Network Express (ONE), The Alliance) omitted several calls along their itineraries to minimize the impact on vessel schedules. They also announced blanked calls, permitted customers to divert traffic, or even recommended shippers redirected to other ports to avoid delays. It took one month before operators announced the resumption of normal terminal operations, with hundreds of thousands of TEUs backlogged.

Restrictions and operational disruptions at ports in major export hubs such as those in China have deep impacts on container volumes on both the European and United States routes. Delayed cargoes, uncertainties of operating conditions, need for redirecting cargoes and lowering the number of options when shippers could not pick up cargoes and ultimately deliver them to consumers resulted in opportunities for excess rent-seeking by carriers. Container freight rates increased starting in late 2020 and soared in 2021. Rates continued to be high in early 2022.

Increased berthing time in major Asian ports combined with similar delays at ports at the other end of the supply chains (i.e. in the southern Californian ports of Los Angeles and Long Beach) undermined the reliability of maritime services and dented carriers' "on-time performance". All these factors, along with related measures and adaptation, hurt the efficiency performance of ports. India provides a revealing case of how the COVID-19 pandemic affected container port productivity. Container vessels turnaround time increased, container dwell times – defined as the time taken for exports inside terminal gates to be loaded onto a ship and imports onto a truck or train – shot up amid cargo clearance slowness following truck capacity shortages and warehouse closures. Longer dwell times caused harbour congestion while forcing cargo owners to face additional demurrage and storage fees – the subject of ongoing legal activity between importers and warehouse managers (Bency, 2020a).

Vessel rerouting

The pandemic had an additional impact – the restructuring of vessel schedules. In April 2020, oil demand collapsed and oil prices hit record lows. This led to the falling cost of bunkers, thus providing container lines incentives to save costs by rerouting many of their services. An example is the rerouting of several services around the Cape of Good Hope to avoid the Suez Canal and its associated costs (Baker, 2020). Eventually, the Suez Canal responded by extending its discount offer for container ships transiting the canal on backhaul voyages.

A second reason for the reorganization of container lines itineraries was the indirect impact of the surge of freight rates. Shipping lines started deploying greater tonnage to the profitable East–West, trans-Pacific, and transatlantic trade lanes. An example is MSC, which shifted some 13,000-TEU-capacity vessels from African trading routes in favour of the Pacific. The primary reason behind the shift was the high revenue earned along the East–West trade routes. This increase has been higher than rate indexes estimate, as spot rates do not include the premiums that shippers are willing to pay to secure a booking guarantee. With historic port bottlenecks compounded by a surge in freight rates and less service shipping operations, African shippers faced more challenges in liner services. In addition, routes between Asia and North America attracted extra tonnage with impressive capacity growth that did not match actual cargo growth. Carriers needed much more tonnage as ships were delayed in congested ports in both the United States and Asia.

Other challenges to shipping

Trends shaping liner shipping connectivity, port calls and trade flows amid the pandemic provide an indication of the challenges faced by the shipping industry to confront the new operating landscape and cope with the disruptions. However, the extent and nature of the challenges and responses implemented varied by region, country and role in the maritime supply chain.

The COVID-19-related expenses increased vessel operating costs at their fastest pace in over a decade. The average daily operating costs across the 47 different ship types in 2020 is estimated to have jumped by 4.5 per cent (Drewry Maritime Research, 2021). In comparison, the equivalent increases in the two previous years were estimated at 2 and 2.5 per cent, respectively. Operating expenses either stagnated or contracted over three consecutive years by –8 per cent for the period 2015–2017.

The 2020 period of the COVID-19 pandemic resulted in a reduction of operating expenses through the first half of the year as economic lockdowns and social distancing restrictions closed dry-docking and repair yards. In the face of reduced trade, owners postponed expenditures, except for essential ones. However, costs jumped through the second half of 2020 as repair facilities reopened, unleashing pent-up demand, while crewing costs escalated with the disruption to the crew repatriation arrangements. Crewing costs increased by 6.2 per cent in 2020, while hull and machinery, and protection and indemnity cover costs rose by 4.5 per cent. Disruption to supplies and labour availability pushed the stores, spares, as well as repair and maintenance cost inflation to around 3 per cent, while dry-docking spending soared by 5 per cent.

In this context, by May 2020, 6 out of the top 10 carriers (CMA CGM, COSCO, HMM, Evergreen, Yangming, PIL) had sought state aid. Eight out of the twelve largest container lines received financial support from their governments. Governments provided shipping aid packages with very few conditions attached. They imposed few conditions in terms of public policy objectives other than the immediate goal of mitigating the shipping sector's economic losses (International Transport Forum and Organisation for Economic Co-operation and Development, 2020).

Container ship sales increased, as did the prices for second-hand tonnage and charter rates. According to *Alphaliner*, 22 ships were sold per month in Q3 2020, with annual ship sales exceeding those for 2019. Renewed demand pushed prices up, with Panama vessel prices increasing by up to 30 per cent between May and November 2020. Increased prices affected the charter market as rates increased for all ship types on the back of an increasingly tight supply.

The above implications were not limited to container shipping. Chemical tankers were also in the front line. However, the diverse nature of the cargoes carried meant the situation was not as bad as might have been expected. When the full force of the COVID-19 outbreak hit China in early 2020, the country's production and demand for chemicals slowed, with plants shutting down or reducing operating rates to alleviate oversupply. However, some plants continued to operate, boosting domestic organic chemical supply. Overall, the impact on the chemical tanker sector was limited, with some decline in spot rates that were more than offset by collapsing bunker prices. In addition, few chemical tankers have scrubbers installed, meaning most operators benefited from low sulfur heavy fuel oil prices.

In the four months of 2020, cargoes available to the chemical tanker sector registered a net decline (–2.2 per cent).¹² Then as the Chinese economy resumed operations, concerns shifted to the potential impact of reduced demand for manufactured goods on the output of the chemical sector. In addition, panic buying and lifestyle adjustments had increased short-term demand for packaging and hard plastics.

Pandemic-led slowdown held back LNG deliveries. An illustrative example is the case of cargoes from Africa to the rest of the world. Ships laden with liquefied natural gas have taken weeks longer than usual to land in Europe. One of Africa's top LNG producers, Nigeria, was hit hard by the slowdown in Europe's LNG demand in the early days of the pandemic. When gas prices crashed to a record low in May 2020, European buyers opted to defer deliveries. Consequently, cargo was stranded at sea for two months and was rerouted to India and Bangladesh. The ship demolition sector was also negatively affected across India, Bangladesh and Pakistan. As a result, recycling prices increased.

¹² Chemical tanker owners confront "second wave" impact of coronavirus, <https://splash247.com/chemical-tanker-owners-confront-second-wave-impact-of-coronavirus/>, 20 May 2020.

Landside operations

Challenges started at the first-mile stage of the maritime supply chain. The lockdowns and the pandemic-related restrictions stopped manufacturing of several items. Consequently, some of the worst disruptions hit the supply chains for those respective industries. These disruptions created, among others, some massive queues of vessels waiting to load exporting cargoes from East and South-East Asia.

Implementation of, and adjustment to, the measures applied to fend against the spread of the virus resulted in an increase in the time trucks required to move in and out of ports. Ports across regions reported an increase in delays on trucks crossing borders, as restrictions on transportation via transit countries had drastically reduced the connectivity, efficiency and service reliability. Some trucks took three months to access the filled-up terminals in Africa, as there was no space to drop export containers. The infrastructure on the ground could not cope with the volume of cargo accessing the port. This resulted in exporters hiring barges and berthing by the sides of vessels to load directly from the barges to vessels. Such operational inefficiencies at ports led to multiple blank sailings.

In addition, the implications of the measures to reduce the spread of the pandemic negatively affected customs operations. Particularly when paperwork was essential, customs clearing processes were slow, with trucks queuing, creating huge problems to respect deadlines with shipping companies.

Furthermore, last-mile vulnerabilities in distribution became more visible because of the lower availability of workforces in interlinked activities, such as lack of truck drivers and limitations in the provision of truck services due to COVID-19-related restrictions. In particular, the initial phase of the pandemic immediately exposed the potential fragility of the global supply chains and brought into focus possible severe shortages of products needed in the fight against the pandemic.

Picking up cargoes at destination and returning empty containers as initially scheduled created challenges at the last-mile stage of the supply chain. Immediately after the pandemic hit, some retailers and manufacturers failed to pick up their cargoes and containers as the imposed restrictive measures limited economic transactions and warehouses were overutilized or closed. Consequences on the supply chain were manifold. Availability and social distancing rules for trucking, handling, warehousing staff, or opening windows of facilities under lockdown and capacity constraints in truck and other inland transport systems due, for example, to delays in undergoing necessary testing or delays by factories in returning containers, reduced the fluidity of supply chains (Mongelluzzo, 2020a). Container dwell times increased, containers stayed on chassis at warehouses much longer than normal, and empty containers could not return to the system despite being badly needed. Repositioning containers started to be even more difficult as the same number of containers started rotating more slowly than before once trade regained the previous level. The global supply fell behind at a critical time, just before the peak shipping season in autumn. A spike in orders in July and August 2020 following the reopening of economies after the first coronavirus lockdowns became the root cause of the shortage.

Importing countries (destination) experienced some shortages of goods in the very first phase of the pandemic. In the early days of the pandemic, countries where life and economic transactions were interrupted found it hard to provide adequate medical care due to shortages of critical medical equipment such as ventilators, protective masks, and other gear. Before the pandemic, for instance, China produced approximately half of the world's face masks. As the infection spread across China, their exports came to a halt. Adjustments, however, took place; with the infection spreading globally and transmission in China slowing, China started shipping masks to other countries as part of goodwill packages. The delays to the essential cargo, including foodstuffs and medicals, proved minimal.

Some of the challenges were overcome by the synchronous substantial decrease of consumer demand. Subsequently, berth productivity became an important factor in unlocking the observed port congestion. The presence of round-the-clock operations, quality terminal assets, and sufficient physical capacity to handle sudden surges in demand was necessary to reverse the situation. Another consequence was the shortage of containers for exports.

Other implications

As the pandemic heightened the focus on supply chain risk and resilience, manufacturers and governments rethought the risks of over reliance on certain sources or logistics nodes. The issue of relocating out of specific countries and/or regions moved to the fore, even though there was no consensus on which country could act as a suitable replacement. Producers and manufacturers might focus more on regionalization to shorten supply chains, manage inventory differently and reach markets faster. Several countries were led to reassess supply chains, particularly for medical equipment and critical drugs.

Amid the pandemic, some observers argued that such considerations could accelerate the relocation of production from traditional global factories such as certain South-East Asian countries to regional manufacturing zones (UNCTAD, 2020c) This debate was reignited with the proliferation of shipping network disruptions including accidents, climate change impact issues, continued COVID-19 and related restrictions in China, and more recently the conflict in the Black Sea region. Diversifying away from existing production locations is not straightforward, however. Among other factors, the scale of production and the highly competitive transport and logistics costs in existing production locations relative to other low-cost locations make it difficult for these to readily act as full substitutes for China.

That said, should existing globalization patterns shift, resulting in more regionalized or closer-to-home production, shipping networks and configurations would be affected. For example, in many Asian ports, trans-shipment activities and hub-and-spoke could become a preferential service over relay trans-shipment. In these conditions, game changers could be intermodal seamlessness and efficiency between sea, rail, barge, truck and air, aided by digital continuity and control across transport modes.

Overview of responses and mitigation measures

This section draws upon the initiatives that are explicitly detailed in the three regional reports on the impact of COVID-19 on maritime supply chains and in Africa, Asia and the LAC regions respectively (see further below) developed under the UNDA project on “Transport and trade connectivity in the age of pandemics: Contactless, seamless and collaborative UN solutions”. It was also informed by feedback provided by industry stakeholders during the [UNCTAD regional webinars](#) on “COVID-19 and Maritime Transport” held in 2020 and 2021, in Africa, Asia and LAC. These events were organized in close collaboration with the United Nations regional economic commissions for Africa (UNECA), Asia-Pacific (UNESCAP), Latin America and the Caribbean (UNECLAC) and Western Asia (ESCWA). Information on responses and mitigation measures introduced amid the pandemic was further enhanced by the feedback received by way of the UNCTAD survey launched in May 2021 and which focused on “*COVID-19 and Maritime Transport: Resilience-Building and Preparedness*”. Together with the regional webinars, the survey was part of the project activities. It sought to gather input about the COVID-19 impact on the maritime supply chain, the response measures implemented and resilience-building capabilities and needs. Business and operational continuity.

When national quarantines and lockdowns were declared, several national administrations and relevant authorities considered it fundamental that ports and the maritime supply chain remained operational. As a minimum, they should continue to deliver essential provisions (i.e. critical medical components, foodstuffs, energy) and if possible, to deliver trade. General rules and protocols imposed on all economic activities were applied across the maritime supply chain. When the horizontal protocols were considered insufficient, additional measures were developed to ensure virus containment and the safe conduct of economic activities.

Immediate actions to ensure business continuity and continued port operations focused on three priorities, namely: (a) changes to working practices; (b) operational adjustments; (c) enhancement of communications with all stakeholders. Even in countries that decided not to implement strict measures in response to the pandemic (i.e. Brazil), port authorities opted to revisit the existing procedures in light of the emerging crisis.

Change to working practices

Changes to working practices aimed to contain the virus and limit its spread. These changes were underpinned by three key elements. First, the timely implementation of protocols. These provided guidelines for preventing the transmission of COVID-19 and for promoting the timely detection of cases ashore and on board. These protocols enforced physical distancing in the working environment, including gang shifts and functional practices ashore and on board the vessels to protect the well-being of employees. Protocols included sanitary measures, such as installation of alcohol gel dispensers in different strategic points of the port, screening processes to access the port supported by an epidemic questionnaire and temperature check, mass testing, prevention guidelines, monitoring and integrated reporting of COVID-19 cases and interaction with local and national sanitary agencies. Once vaccines were made available, prioritizing vaccination for port workers, seafarers and other frontline maritime personnel (such as harbour pilots, cargo officers, marine surveyors and marine superintendents) was seen as essential in several countries. These measures were intended to carefully balance preserving public health without compromising the respective country's capacity to participate in international maritime trade.

The second element involved the use of remote working practices for administrative personnel and the revisiting of working hours to reduce social interactions, crowding, the use of shared facilities and transportation. Teleworking was occasionally backed with financial support and more flexible benefits.

Third, relevant action included offering special care to the workers who were most vulnerable to contracting the virus, such as workers over 60 years old, pregnant women, and people with chronic diseases.

Operational adjustments

Many operational adjustments were implemented, including adjustments to port operations. The first set of measures included revising vessel and terminal access processes, online gate process options and gate hours, splitting working teams (dockworker gangs), and longer shifting breaks to ensure social distancing. A second set of initiatives focused on avoiding yard capacity overutilization that would eventually undermine efficient operations. The emphasis was on identifying, in partnership with other public authorities, ways to ensure the fluidity of cargo towards inland destinations. Measures that sought to enable companies to remove import containers, even if these companies were not allowed to produce due to the pandemic, included: (a) enabling the operation of companies offering support logistics critical for port operations, including those carrying out maintenance, repairs and value-added services; (b) conditions that would allow local cargo to be processed outside ports to avoid increasing container utilization; (c) exploring ways to lower vehicle restrictions to avoid further load release delays; (d) improving digital platforms for permits and licences and improving coordination between stakeholders and responsible public authorities.

There are also examples (i.e. India) where efforts to avert widespread congestion included coordinating terminal operators with customs officials to shift import containers to newly identified freight locations farther away from ports while sending direct port delivery shipments, usually cleared from the wharf itself, directly to rail yards. Those efforts paid off as yard inventory levels were sustained well within capacity limits.

New conditions for approaching vessels were imposed to prevent a widespread outbreak capable of overwhelming healthcare systems. With lockdowns came a ban on crew changes. Ports did not hesitate (or were obliged) to ban visits by incoming citizens beyond those assessed as essential workers. This practice went as far as banning seafarers whose vessels had called at other ports. There were also ports where the maritime sanitary authority had not established the protocol for crew change. In other countries, there was a clear distinction between vessels based on their flag, with crew changes being prohibited in the case of foreign-flagged vessels while nationally registered vessels could change nationals on board. Measures to ease the situation had to be coordinated to avoid duplication and overlapping, with national governments and institutions leading the coordination of a sectoral response.

In addition, ports applied advanced contingency plans, with all vessels following new protocols for clearance to enter the port. These protocols required vessels to quarantine for 14–28 days if they had previously berthed or performed a crew change within 14 days of arriving from countries that had recorded a significant number of infections. Such quarantines for cargo ships arriving from other countries became a disruptive factor that harmed inventory flows. Other countries required ships to declare to the port health office, within 48 hours before notice of readiness or arrival, the health status of the members of the crew and a voyage memo of the last 10 ports of call, information that was subjected to rigorous inspection, with crews not being allowed to leave the vessel. Similarly, in the early days of the pandemic, some countries did not hesitate to ban imported cargo (i.e. not importing food via reefers) before medical confirmation that such trade was safe and did not have the potential to import and spread the virus.

The increase in number of ships that faced longer stays at anchorage implied some additional safety concerns to be addressed by ports and terminals. These included higher probability of exposure to extreme weather conditions and associated grounding and collision risks. In response, ports had to formulate and proactively communicate their policies on the use of anchorage areas.

Shipping carriers prioritized business continuity via operational adjustments. Beyond applying similar protocols and guidelines, they applied operational adaptations (i.e. service and frequency changes) in a short period of time. In addition to blank sailings and the suspension of services, shipping lines had to innovate with new service and storage solutions to minimize booking cancellations by shippers. An example is MSC, which introduced a “suspension of transit” container shipping programme using some of the world's leading trans-shipment hubs, including Busan and King Abdullah Port, as advance yard storage to help shippers begin moving goods early in anticipation of a demand recovery (MSC, 2020). This provided flexibility and substantial cost savings as it enabled shippers to better control storage costs at the point of booking while adapting the delivery date to their own needs. It also helped decrease congestion in the ports of discharge and improve efficiency, as products were placed closer to distribution networks. At the same time, MSC also reintroduced services that had been discontinued in the past.

To mitigate congestion and delays – exacerbated by the confluence of surging demand, renewed cases of COVID-19 and restrictions at Chinese ports, and capacity constraints at destination ports – several carriers, including CMA CGM, Zim and Maersk Line, offered “premium services”, which guaranteed customers’ priority and reliable services at United States ports against additional costs (Mongelluzzo, 2020b). Carriers reduced free storage time at warehouses at destination, denied export bookings to quickly return the containers and get the empties back to Asia, and repositioned empty containers to Asia from other trade lanes. Many carriers also skipped several calls at Yantian port, for example, to minimize the impact on vessel schedules. Meanwhile, port customers were advised to divert traffic, or redirect the traffic to other Chinese ports to avoid delays.

As regards seafarers, establishing a mechanism to fight COVID-19 on board vessels via prompt identification, isolation and treatment was essential. Priority given to testing crews prior to joining a vessel as well as on departure and arrival at ports to avoid delays in obtaining the necessary permissions, was also important. This was a game changer in safeguarding seafarers on board and controlling surprise disruption related to COVID-19 (delays, demurrage, and more). It also provided assurances of health to port countries working to protect their citizens while keeping trade moving.

Effective communication of plans

A critical role in maintaining operations in 2020 was the timely communication of the adopted measures. Effective communication plans and practices were vital. Port authorities cooperated with several actors, less for the design of these protocols but mostly to reinforce their applications and secure proper implementation. Constant access to clear, accurate and correct information kept stakeholders and the local community informed and aware of measures. This was a multilayer effort that also included reinforced communication with the community in partnership with public authorities.

Financial support

Measures aimed at achieving financial sustainability were also implemented, with ports and terminals taking the following actions:

- Offering an extended period of free storage in port zones or terminals, even despite the scarcity of space, aiming to facilitate shippers continuing transport of cargoes and to be ready once economies reopened. In some cases, governments provided compensation to terminal operators as a relief for this move, with occasional announcements of sanctions in cases of any form of non-compliance.
- Adjustments of reservation systems (i.e. more extended periods available for the placement of booking guarantees or advance payment of reservation fees) to provide port users with added flexibility and relief.
- Revised contracts regarding payments and booking slots before the vessel initiates the transit, allowing flexibility to reduce the financial burden for customers so that all could be best prepared for the post-pandemic period.
- Early payment of supplies by port authorities to third party suppliers, especially the smaller ones, who were confronted with adverse financial conditions.
- Streamlining of port payments to contribute to mitigate the negative effects of the crisis on port users and providers, and provide liquidity to companies working for the port. Likewise, ports revisited their policies on rebates to users and reduction in port dues, concession fees, minimum activity rates and penalties affecting traffic thresholds.
- Actions to support local communities by strengthening humanitarian efforts. Port practices included, for example, purchasing, distribution and donation of medical supplies. For some ports, this was combined with the establishment of partnerships with port community stakeholders to financially support maintenance of medical equipment for COVID-19 treatment (for example, maintenance and repair of mechanical respirators) and the provision of hygienic kits to port workers and port commercial visitors (for example, truck drivers).
- Endorsement of strategies as regards labour zero layoffs or contract breaches, and provision of funds to implement measures to protect employees' health and maintain jobs.

In some cases, governments also intervened to facilitate financial sustainability, for example, by asking container terminal operators and ocean carriers to collaborate with other players in the supply chain (i.e. freight station owners) and suspending penalties and ground rent charges on containers caught up in the lockdown. There are also cases of national administrations that provided financial aid packages to support the local maritime cluster (i.e. financial support to maritime companies, seafarers and individuals, port dues concessions for cargo vessels, and the like).

Some ports declared force majeure to pre-empt claims, as legal liability for any disruptions in the supply chain would have been potentially detrimental for imports and exports. Despite efforts to maintain the operation of receiving ships, and to assure delivering and receiving goods at warehouses and yards and service facilities related to the port system, delays during the ordinary course of transit or while goods were in storage were inevitable. Cargo was held for longer at ports and storage locations saw volume increases while stocks awaited their next destination. Therefore, cargo owners, importers, risk managers and insurers closely monitored cargo accumulation, delays, demurrage charges, deviations of trade, and interruptions of transit and trade, to determine the main cause, i.e. whether due to force majeure. Given the force majeure declaration, the insurance implications from the disruption of shipping and logistics due to the pandemic were relatively minimal.

Hinterland connections

The coordination of relevant activities at the borders to facilitate trade flows from vessels to their final destination or from origin (i.e. production, hinterland connections involving transport to and from the port for transportation) were also in the front line. Efforts to coordinate customs operations, as well as border controls and inspections, were critical. Such coordination was important to offset the increased checks imposed by the need to contain the pandemic. Coordination was also important in the case of the quarantines required for cargo ships arriving at a port.

Support for a model shift, or diversifying the means of delivery such as through freight train operations, was pursued as a measure to mitigate the negative effects of the restrictions of operations and the more stringent requirements affecting international road freight drivers (for example, in China).

Digitalization

During 2020, the COVID-19 pandemic accelerated the transition to digitalization. With the onset of the pandemic, ports and other actors replaced paper-based processes with technologies that optimized resources, shared information, and enabled remote working and conclusion of processes. The scope of these initiatives was the escalation of information-sharing along the chain, with fewer manual interactions, the flexibility to adapt quickly in response to changing conditions and frequent adjustments.

Examples of such measures include the introduction of digital systems that enabled carriers to register vehicles and enter to remove the load, and remove import cargo without the need to present printed documents. These systems also allowed for online billing of all import and export services, booking processes, invoicing, and obtaining shifts for the withdrawal or delivery of empty containers; shipping companies could also consult the shipping lists of each vessel. Digitalization allowed carriers to issue authorizations and extensions for ships, conclude employment agreements involving seafarers, issue and validate certificates, and grant authorizations to implement remote inspections.

Digitalization proved useful for improved planning of tug and pilotage services in a way that helped increase the reliability of vessel departure or arrival times. In some cases, accelerated digitalization included setting up online platforms for key stakeholders to meet and discuss issues related not only to port operations but also to corridor transportation and trade facilitation (i.e. real-time updates on what was happening at each transit or transport node along the corridor, sharing experiences and exchanging views about challenges and opportunities arising with the pandemic) (Northern Corridor and the East African Community, 2020).

Accelerated digitalization imposed further challenges to some of those companies involved, especially regional medium-sized and small family-run shipping companies dominating several markets. While these may have recognized the need for urgent digital transformation, they also lacked access to technical expertise and funding sources available to bigger carriers operating on a global scale.

Perishable goods

The treatment of vulnerable goods and perishable items such as pharmaceutical products and their processing with a stringent and well-monitored schedule was among the priorities of public administrations and all stakeholders from the outbreak of the pandemic. Measures for the priority goods included fast clearance of anti-epidemic supplies via the opening of exclusive counters and green lanes 24/7. Imported pharmaceuticals, disinfection supplies, protective suits, treatment equipment and other supplies were released without delay, and green lanes provided 24/7 for exported supplies to minimize the clearance time. Additional measures included putting in place a no-stop, no-check, toll-free policy for vehicles transporting emergency supplies and essential personnel; and providing financial support to companies affected by the COVID-19 outbreak, particularly small and medium-sized enterprises and those tasked with transporting essential goods and daily necessities. Some countries strived to apply customs rules to facilitate the international trade of medical supplies, both to incentivize imports and disincentivize exports. Customs were part of the adjustment processes. They coordinated border efforts and provided solutions on faster clearance, minimum-interference customs control, certification services, and acceleration of market access processes to stimulate the free flow of essential goods, including medical and foodstuffs.

Cooperation and dialogue

Several ports created forums and joined intersectoral discussion committees. This included initiatives at the international but also national levels. The aim was to create task forces that analysed and managed the pandemic's impacts on the global port sector and shared the industry's experiences in actions to address the health crisis.

Beyond the strategic dialogues with government and other stakeholders through professional-sector associations, ports sought to work to exchange experiences and share best practices. An illustrative case is the Port Authorities Roundtable that was inaugurated via a virtual declaration of 20 leading ports from Asia, Europe, Western Asia and North America that vowed to keep their ports open.¹³

Ports started organizing strategic dialogues with public authorities at the national or regional levels to establish the basis for response measures collectively. This was particularly important as many governmental emergency measures needed to be implemented within a short period, even within a day. Cooperation between public and private organizations sitting on crisis committees that monitored developments, shared and disseminated information and protocols, enhanced overall knowledge on how to address COVID-19 and its implications, and proposed mitigation guidelines, were also frequent.

¹³ The 20 ports that signed the declaration are Abu Dhabi, Antwerp, Bangkok, Barcelona, Busan, Guangzhou, Hamburg, Klang, Kobe, Le Havre, Long Beach, Los Angeles, Montreal, Ningbo-Zhoushan, Rotterdam, Seattle, Shanghai, Singapore, Tokyo and Yokohama.

PART II:

COVID-19 AND MARITIME TRANSPORT – REGIONAL FOCUS AFRICA

Impacts and challenges

COVID-19 had a negative impact in Africa and on the maritime supply chains serving the continent. African countries experienced a decrease in vessel calls in every quarter of 2020. However, they performed relatively better than the world average. The container shipping segment was relatively less impacted despite the highly volatile market. However, recovery trends diverged. East and Southern Africa experienced drops in vessel calls. In African SIDS the positive trends of the pre-pandemic period evaporated, and for six months (March–September) the decline created major concerns. However, in the final part of the year, the number of calls started rising again towards levels present before the crisis. A mixed picture emerges when considering the impact on Africa’s liner shipping connectivity.

Africa’s pre-pandemic liner shipping connectivity levels were maintained in 2020 despite the negative impact of blank sailings on service frequency. However, the connectivity levels were maintained mainly by the increased vessel sizes deployed while the number of services, direct calls and number of operators providing services in African ports declined. Apart from blank sailing and suspending services, some carriers rerouted, benefiting from lower fuel costs. Meanwhile, increased freight rates remained a cause of concern, especially for food-import-dependent African countries.

The relatively weak performance and operational inefficiency of many African ports undermines their preparedness and ability to cope with disruptions, as was the case during 2020. Five of the bottom ten countries ranked according to their port performance (as measured by average port hours weighted by the size of vessels) are located in Africa. The continent requires improved infrastructure and implementation of requisite port and trade facilitation reforms that can help ports in the region handle the ever-growing demand effectively.

The conditions for forwarding cargoes to their destination via hinterland operations were also adjusted (i.e. trucks moving in and out of the port and border crossings). They were heavily affected by the nature of the pandemic and the need for social distancing and limited human interactions, several bans, restrictions and other practices (i.e. changing drivers at the borders). These factors proved to be a major challenge.

Response measures to the COVID-19 pandemic varied; they included operational adjustment measures that sought to maintain the continuity of port operations; the endorsement of sanitary measures and their implementation; changes to working practices; and the implementation of testing protocols. That said, COVID-9 infections in ports in many countries continued to occur and disrupt operations. Other response measures focused on improving collaboration, including between public administrations and ports.

The following sections present in more detail key trends shaping the maritime transport of Africa during the 2020 period of the COVID-19 pandemic.

Trade and vessel calls

Africa, the second most populated continent, and the maritime supply chains that serve its 1.37 billion population did not remain unaffected. In the second quarter of 2020, UNCTAD estimated the drop in Africa’s exports at –35 per cent and the drop in imports at –25 per cent. There were some improvements by the end of Q2, but double-digit declines of –17 per cent for imports and –21 per cent exports remained.

In Q3 imports decreased by –7 per cent and exports by –12 per cent, before, in Q4, importing goods trade rebounding, standing 1 per cent higher than 2019, and exports were at a better level (–8 per cent).¹⁴

Africa’s international trade relies heavily on shipping and ports. While about one third of African countries are landlocked, maritime transport remains the main gateway to the global marketplace. Africa accounts for a small share of world merchandise trade by value but contributes relatively larger shares to globalized maritime trade volumes.

In 2020 the pandemic caused disruptions to the movement of both imports to and exports from Africa. Several African countries (for example, Ghana, Nigeria, Sierra Leone, South Africa, the Sudan, Uganda, the United Republic of Tanzania, Zambia, Zimbabwe) imposed lockdowns (Haider et al., 2020). The Sudan closed airports, ports and land crossings. The United Republic of Tanzania kept ports open but imposed restrictions against unnecessary movements between and within affected regions. Ghana closed national borders to international travellers. Nigeria suspended international air passenger travel, imposed geographic containment of Abuja and Lagos, and imposed other interstate travel restrictions across the country. In other countries, varying degrees of geographic containment were applied.

African countries experienced a decrease in seagoing vessel calls across 2020. Total vessel calls at African ports fell by –5.25 per cent (table 21), a rate close to the global average (–5.15 per cent). When only cargo-carrying vessels are accounted for, the drop moderates slightly to –4.3 per cent. Passenger transport was hit hard – in 2020, Africa’s passenger vessel calls declined by –48.7 per cent compared with 2019.

Africa maintained its share (9 per cent) of world total vessel calls (cargo and passenger included). The decline started in Q1 2020 (–4.1 per cent), before intensifying in Q2 and Q3. The negative trend moderated by Q4 when vessel calls fell by –9.7 per cent. When passenger vessel calls are excluded, the decline lowers in magnitude (figure 22).

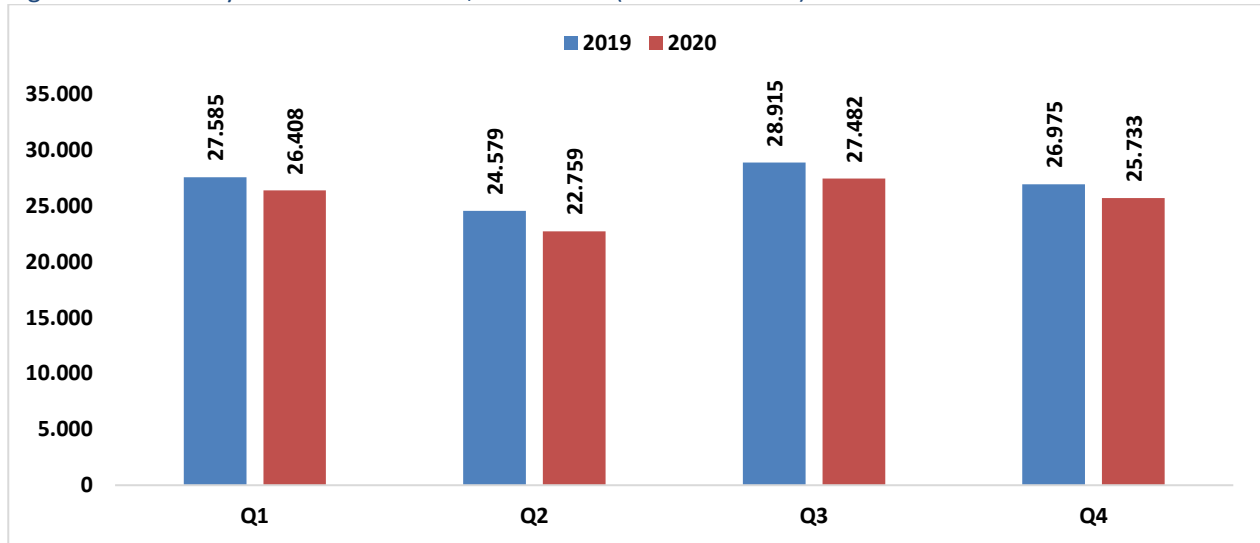
Table 21: Cargo vessel calls by vessel type in Africa, 2019–2020 (number of calls and percentage change)

	Container ships	Dry breakbul	Dry bulk	Wet bulk	LNG carriers	LPG carriers	Ro-Ro
Calls 2019	172 055	8 660	60 966	80 836	9 604	8 380	3 609
Calls 2020	107 014	37 910	1 855	3 308	891	107 014	37 910
Africa (total) (Δ%)	–3.9	–8.3	–5.0	–2.8	–5.0	7.5	–18.2
East Africa (Δ%)	–12.9	–12.0	–12.2	2.1	1.6	48.7	–9.1
North Africa (Δ%)	–2.0	–9.7	2.8	–7.0	–2.1	9.5	–23.4
Southern Africa (Δ%)	–9.7	–24.4	–12.4	2.3	–56.1	–19.0	–17.1
West Africa (Δ%)	–0.5	–4.0	–7.9	–0.5	–5.8	1.0	–7.8

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

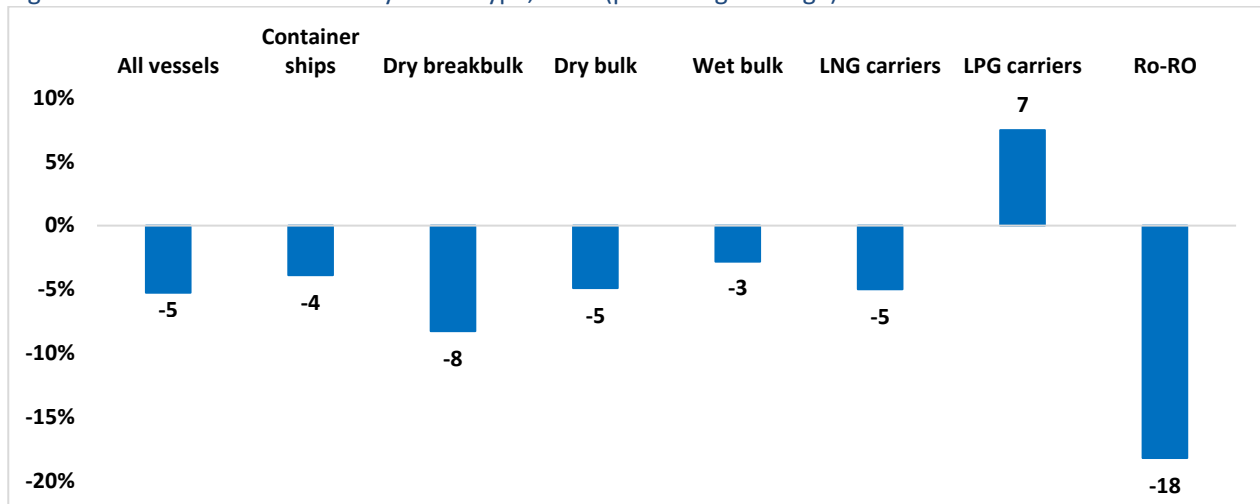
¹⁴ From UNCTAD, *Global Trade Update*, various issues.

Figure 22: Quarterly vessel calls in Africa, 2019–2020 (number of calls)



Source: All types of cargo-carrying vessels; passenger vessels excluded; UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Figure 23: Vessel calls in Africa by vessel type, 2020 (percentage change)



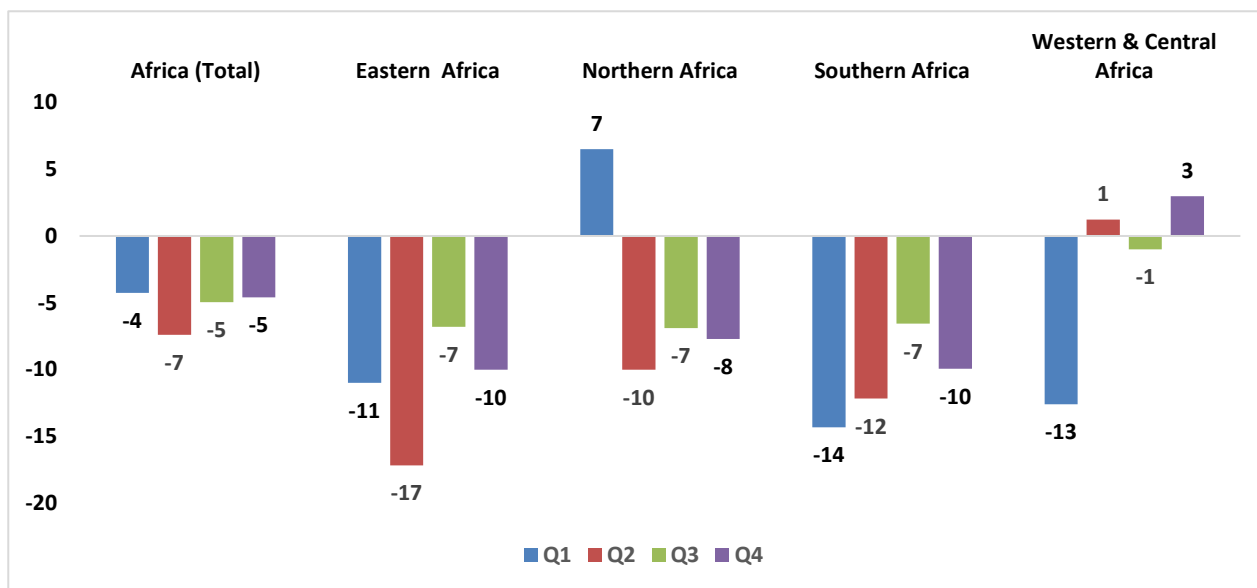
Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Except for the relatively small market of LPG carriers, pressure was felt across all maritime shipping segments (figure 23). In 2020, container vessel calls fell by –3.9 per cent compared with 2019. Port calls by dry breakbulk vessels fell by –8.3 per cent while calls by wet bulk and dry bulk carriers as well as LNG vessels fell by –2.8 per cent, –4.9 per cent, and –5.0 per cent, respectively. The LPG sector performed relatively better with calls increasing by an annual 7.5 per cent in 2020. Port calls by Ro-Ro vessels dipped –18.2 per cent while passenger vessel slumped by –48.7 per cent.

The impact was not homogeneous across the continent. Trends in vessel calls also varied by African region (figure 24).¹⁵ North Africa had a good start to the year with an increase of 6.5 per cent before the pandemic hit. By Q2 vessel calls in the region had declined by –10 per cent. Vessel calls in East Africa dipped by –17.2 per cent in Q2 2020 while calls in Southern Africa declined by –12.2 per cent in the same quarter. These three parts of the continent continued to experience a drop in calls for the rest of the year. In East Africa, which accounts for approximately 11 per cent of the total cargo vessel calls in Africa, the decline was significant in four out of the five countries that host more than one thousand calls, i.e. Kenya (–9.2 per cent), Mauritius (–18 per cent), Mozambique (–19.4 per cent) and the United Republic of Tanzania (–11.3 per cent).

North Africa hosts about half of the total vessel calls in Africa. Its total vessel calls fell by –4.7 per cent in 2020. A negative trend was recorded in almost all countries, including Egypt, which hosts one out of four vessel calls in Africa. Vessel calls fell by –6.3 per cent in Egypt. Morocco, which hosts 10 per cent of vessel calls in Africa, managed to navigate through the initial shock (–13 per cent in Q2 2020), and recorded a moderate decline rate by end of year (–2.9 per cent in Q4 2020). Algeria experienced an increase in vessels calls (3.8 per cent), while vessel calls in Tunisia fell by –11.5 per cent in 2020. One third of vessel calls in Africa are hosted by West African ports. Even during Q2 2020, calls in the region increased by 1.2 per cent. The decline observed in the third quarter of the year (–1.0 per cent) proved short-lived. In Q4 2020, the number of calls was again higher (3.0 per cent) than the same period in 2019. In Nigeria calls declined by –1.7 per cent in Q2 and by –2.4 per cent during the full year. The Congo (–13.9 per cent) and Senegal (–11.9 per cent), which host at least 1,000 calls per year, experienced double-digit percentage declines in vessel calls.

Figure 24: Change in vessel calls by African region, 2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021); only cargo-carrying vessels; passenger ships calls are not included.

¹⁵ East Africa: the Comoros, Djibouti, Eritrea, Kenya, Madagascar, Mauritius, Mayotte, Mozambique, Reunion, Seychelles, Somalia, the United Republic of Tanzania; North Africa: Algeria, Egypt, Libya, Morocco, the Sudan, Tunisia; Southern Africa: Namibia, South Africa; West and Central Africa: Angola, Benin, Cameroon, Cabo Verde, the Congo, Côte d'Ivoire, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Saint Helena, Togo.

In 2020, SIDS in Africa experienced a significant decline in their vessel calls (-26.1 per cent). In Q1 2020, the number of calls declined by -8.3 per cent, before dipping in Q2 (-35.4 per cent). The negative trend continued in Q3 (-36.4 per cent) and Q4 (-26.1 per cent). All SIDS experienced a decrease in vessel calls. Cabo Verde and the Comoros saw the number of their vessel calls in 2020 cut by half and over one third, respectively. Trends varied by shipping segment (table 22). Container vessel calls fell by -17.5 per cent compared with 2019, mainly reflecting Q2 and Q3 blank sailing (-33.0 and -22.8 per cent, respectively). By Q4, container vessel calls reversed trend and increased by 7.4 per cent. This reflected increased traffic in Port Louis, Mauritius (18.5 per cent), which hosts 60 per cent of the container vessel calls in all African SIDS. In 2020, dry breakbulk vessel calls decreased by -22.7 per cent while calls by dry bulk carriers fell by -35.4 per cent. Declines in calls were also steep across wet and dry bulk carriers as well as LNG and LPG cargo-carrying vessels.

Container vessel calls

Container vessel calls in the continent were reduced by -3.9 per cent in 2020. The market was resilient despite being highly volatile. In 2020, container vessel traffic in East Africa and Southern Africa declined (-12.8 and -9.7 per cent, respectively). The demand shock produced by the pandemic and the subsequent lockdowns contributed to this decline. However, East Africa managed to recover, unlike Southern Africa. In West Africa, the overall impact on the total number of container vessel calls was marginal (-0.4 per cent). Container vessel calls in North Africa declined by -2 per cent. Eight of the 15 countries that host most calls in Africa experienced a decrease in container vessel calls in the full year 2020: Egypt (-7.9 per cent), Kenya (-10.9 per cent), Mauritius (-14.8 per cent), Mozambique (-28.4 per cent), Nigeria (-9.5 per cent), Senegal (-10.7 per cent) and South Africa (-9.7 per cent). Algeria, Morocco and Togo increased their container vessel calls in 2020 (by 18 per cent, 5.7 and 8.4 per cent, respectively).

Bulk, breakbulk and Ro-Ro vessel calls

Calls by ships transporting dry breakbulk cargoes in Africa declined in 2020 by -8.2 per cent overall compared with the calls in 2019. Dry breakbulk vessel calls decreased significantly in Southern Africa (-24.4 per cent) and East Africa (-12.0 per cent). However, they declined at a lower rate in North Africa (-9.7 per cent) and Western Africa (-4 per cent). During first year of the pandemic, 13 out of the 15 countries that host most breakbulk calls in Africa recorded a decline of such calls. Double-digit decreases were recorded across 11 countries. Focusing on the major markets, i.e. countries with more than one thousand calls, Algeria (-13.2 per cent), Egypt (-13.5 per cent) and Morocco (-7.3 per cent) experienced drops in breakbulk vessel calls. On the other hand, the biggest market of all, Guinea, which hosts one quarter of the total breakbulk vessel calls in Africa, experienced a remarkable increase of 28 per cent in 2020. The United Arab Emirates was the only other country that experienced a positive growth (17.4 per cent) in breakbulk vessel calls in 2020.

Dry bulk operators, in particular, faced an ever-longer list of port restrictions that had considerable impact on voyages. A major coal exporting hub, South Africa was in lockdowns and all mines in the country were closed in March 2020. Mines reopened after a few weeks but returning to normal took months (Basquill, 2020). The country's main ports continued to operate, but some berths at Durban, Cape Town, Port Elizabeth and the deep-water Port of Ngqura in the Eastern Cape were closed, as were Richards Bay, one of the world's top coal ports, and East London during the COVID-19 lockdown. Cargo was later allowed at eight of South Africa's ports but cargo from high-risk countries had to be sanitized.

COVID-19 reduced South Africa's exports and adversely affected job numbers (Arndt et al., 2020). In the initial lockdown regulations, exporting wine from South Africa was considered non-essential. Moreover, the necessity of shortsea Ro-Ro services was recognized, and in some countries, subsidies were being considered in the early days of the pandemic.

Calls of dry bulk carriers declined in 2020 (-4.9 per cent) compared with 2019. Declines were observed across the African regions – West Africa (-7.9), East Africa (-12.2 per cent) and Southern Africa (-12.4 per cent). In contrast, North African ports recorded growth (2.8 per cent). The latter region hosts almost half of the total dry bulk vessel calls in the continent. Egypt, which hosts one third of the total dry bulk vessel calls in Africa, sustained a yearly growth of calls by 2.8 per cent. The two other major markets in North Africa, Algeria and Morocco, also recorded growth with their dry bulk vessel calls. In Cameroon, the Comoros, Côte d'Ivoire, Djibouti, Ghana, Guinea, Kenya, Mauritius, Mozambique, Nigeria, Senegal and South Africa, dry bulk vessel calls also decreased in 2020.

Table 22: Vessel calls in African SIDS, 2019–2020 (percentage change and number of calls)

	Total calls		Containers		Dry breakbulk		Dry bulk		Wet bulk		LNG carriers		LPG carriers		Ro-Ro	
	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)	Calls 2020	Δ (2020/2019)
All SIDS in Africa	2 954	1 025	849	-180	431	-127	864	-468	523	-132	63	-66	85	-19	32	-13
Cabo Verde	273	-7	92	-49	41	-32	75	-99	37	-28		-3	26	-13	2	-4
Comoros	664	-228	69	0	186	-46	284	-174	114	-111	7	4	2	-9	2	0
Mauritius	1 642	-336	547	-95	112	-4	495	-188	354	11	53	-66	54	1	27	-10
Sao Tome and Principe	43	-83	7	7	34	-11		0		-1	2	-2		0		0
Seychelles	225	-351	134	-43	58	-34	10	-7	18	-3	1	1	3	2	1	1

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021); only cargo-carrying vessels; passenger ship calls are not included.

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Container vessel calls in the continent were reduced by –3.9 per cent in 2020. The market was resilient despite being highly volatile. In 2020, container vessel traffic in East Africa and Southern Africa declined (–12.8 and –9.7 per cent, respectively). The demand shock produced by the pandemic and the subsequent lockdowns contributed to this decline. However, East Africa managed to recover, unlike Southern Africa. In West Africa, the overall impact on the total number of container vessel calls was marginal (–0.4 per cent). Container vessel calls in North Africa declined by –2 per cent. Eight of the 15 countries that host most calls in Africa experienced a decrease in container vessel calls in the full year 2020: Egypt (–7.9 per cent), Kenya (–10.9 per cent), Mauritius (–14.8 per cent), Mozambique (–28.4 per cent), Nigeria (–9.5 per cent), Senegal (–10.7 per cent) and South Africa (–9.7 per cent). Algeria, Morocco and Togo increased their container vessel calls in 2020 (by 18 per cent, 5.7 and 8.4 per cent, respectively).

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The pandemic-generated crisis had a major toll on oil demand and tanker markets. The problem, however, only amplified a tendency that was already underway, with climate change imperatives already driving a turn away from fossil fuels. The COVID-19-related lockdowns hit consumption of oil in Europe, leading to reduced need for tankers and thus lower Suez Canal tanker transits (Watkins, 2021). This decline has not been automatic. In the first period of the crisis, the oil price war was estimated to work positively for freight rates because of a sharp rise in spot market demand. By October, due to the second wave of the COVID-19 cases, European countries imposed lockdowns and the oil freight market reversed, leading to reduction of vessels going through the Suez Canal by a quarter. The impact of some of these underlying trends becomes apparent when considering trends in port calls.

Africa's port calls by wet bulk vessels also declined in 2020. Total calls by wet bulk vessels in Africa dropped by 3,287 calls in 2020 or -2.8 per cent compared with 2019. By the end of the year, North and West Africa, the two regions with the most wet bulk vessel calls (40 per cent each), had experienced a very different situation. In North Africa, calls declined by -7.9 per cent. In West Africa, they had remained at the levels of 2019 (-0.5 per cent). On the other hand, the smallest two markets of East and Southern Africa increased calls by wet bulk carriers (by 2.1 and 2.3 per cent, respectively). Egypt, which accounts for 30 per cent of the wet bulk vessel calls in Africa, saw a drop of -5.1 per cent. Togo experienced a decline of -4.1 per cent. Algeria (16.8 per cent), Nigeria (1.8 per cent) and South Africa (7.7 per cent) and all recorded increases in wet bulk vessel calls in 2020. Ghana, Libya, Mozambique and Tunisia all received fewer wet bulk carriers in 2020. Libya and Tunisia experienced the largest declines with -45.7 and -12.5 per cent, respectively. In contrast, Angola, Cameroon, Djibouti, Liberia and Mauritius registered some growth compared with 2019.

Trends in wet bulk vessel calls are also driven by developments in LNG and LPG shipping markets. Despite the disruption, African port calls by LNG and LPG carriers increased in 2020 (2.8 per cent) compared with 2019 (figure 13). However, this overall positive trend is the outcome of the market dynamism of the first quarter of 2020. The impact of the crisis was more pronounced in the second half of the year. In Q3 2020, calls by LNG and LPG vessels in Africa fell by -0.4 per cent. During the last quarter of the year, they declined by -3.0 per cent. Pandemic-led slowdown held back LNG deliveries from Africa to the rest of the world. Ships laden with LNG took longer to land in Europe. For example, as a top LNG producer in Africa, Nigeria was hit hard by the slowdown in Europe's LNG demand from the start of the pandemic. LNG carriers laden with cargoes from Nigeria's Bonny Island resorted to super slow steaming speeds or were diverted to the Indian subcontinent as demand for the fossil fuel in Europe evaporated. When gas prices crashed to a record low in early May 2020, Nigeria accounted for as much as half of the world's floating LNG cargoes. Buyers in Europe opted to defer deliveries. Meanwhile, undelivered LNG cargoes that remained onboard vessels at sea for two months were redirected to India. LNG shipments from Nigeria were also rerouted to Bangladesh.

East Africa recorded an increase of LNG and LPG vessel calls (32.7 per cent) while in Southern Africa, for these calls a reduction of -26.9 per cent was reported. In West Africa, the decline was marginal (-0.8 per cent). North Africa hosted more LNG and LPG vessel calls in 2020 than in 2019 (5.8 per cent). The two major markets, Egypt and Algeria, recorded a drop of -5.3 per cent and a growth of 24.4 per cent, respectively. Nigeria, the third largest market, saw port calls by LNG and LPG vessels drop by -1.0 per cent in 2020. Libya and Morocco registered growth rates of 12.9 and 11.2 per cent, respectively. Meanwhile, LNG and LPG vessel calls in South Africa and Tunisia slumped by -20.1 and -62 per cent, respectively.

Ro-Ro vessels that carry cars, trucks and any other wheeled vehicles were heavily affected by the pandemic in 2020. Calls by Ro-Ro vessels at African ports declined by -11.5 per cent. All African regions experienced a reduction in their Ro-Ro vessel port calls. The magnitude of the decline in Q2 2020 was as high as 44.7 per cent in North Africa and 32.7 per cent in Southern Africa. The decline was relatively more modest in West Africa (-14.7 per cent) and East Africa (-15.1 per cent). The situation in all regions improved in Q3 2020. At country level, the decline in Ro-Ro vessel calls was acute in Morocco (-32.7 per cent), Egypt (-26.1 per cent), Tunisia (-18.1 per cent) and South Africa (-16.9 per cent). Drops in vessel calls were recorded in Benin, Côte d'Ivoire, Kenya and the United Republic of Tanzania. Ro-Ro vessel calls increased in Djibouti, Libya, Nigeria, the Sudan and Togo. In Ghana vessel calls by Ro-Ro vessels remained unchanged.

Liner shipping connectivity

In 2020, Africa expanded its liner shipping connectivity, reflecting the rise in the sizes of the vessels calling at African ports. During the first year of the pandemic, Africa saw a shift in maritime services reaching the continent. By the end of 2020, the total number of services decreased by almost –4 per cent compared with the beginning of 2019 (table 23). The number of operators serving the continent fell by –7.5 per cent. While the number of direct calls also declined, shipping companies deployed larger vessels to and from Africa. By the end of 2020, the maximum container ship capacity increased by 15.5 per cent compared with 2019. The deployed capacity increased only because the increased vessel sizes compensated for the reduction in the number of services, direct calls and operators. The increase in vessel sizes also resulted from cascading larger vessels from main routes to secondary ones, including trades to Africa. Consequently, total container vessel capacity deployed in Arica increased by 12.1 per cent in 2020. The shift in call sizes and, most notably, the consequent change of the number of containers handled per call resulted in operational challenges to many ports (Maree, 2021).

Positive trends were observed in the five most connected African ports (Durban, Lomé, Port Said, Tanger Med and Tema) (figure 25). Yet significant regional variations were recorded. In West Africa, only three of the five best-connected ports experienced some improvements in the LSCI (Lomé, Pointe Noire and Tema) in 2020. Abidjan and Luanda saw LSCI deteriorating. The LSCI in the five best-connected East African ports did not improve in 2020. Port Said and Tanger Med had increased their LSCI by 2020. The situation was mixed in the five best-connected Southern African ports; Port Elisabeth increased its LSCI, which offset the decline in Cape Town.

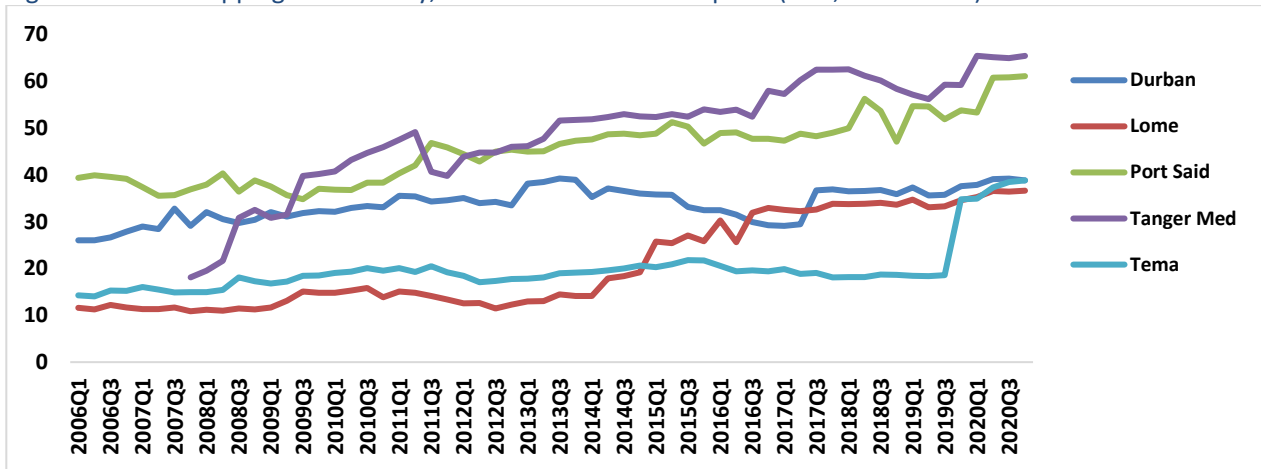
As shown in figure 26, the number of ports that saw their connectivity improve in 2020 (45 ports) was almost identical to the number of ports that recorded a deterioration in their LSCI (46 ports). Twenty-four African ports improved their connectivity by more than 10 per cent. Another 24 saw their connectivity performance drop by over –10 per cent. In eight African ports, namely Malongo in Angola, Palmeira in Cabo Verde, Banana in the Democratic Republic of the Congo, Ehoala and Toliary in Madagascar, Port Mathurin in Mauritius, Luderitz in Namibia, and Richards Bay and East London in South Africa, connectivity levels remained unchanged in 2020 despite the disruption.

Table 23: Liner shipping connectivity components in Africa, 2019–2020 (Q1 2019 LSCI = 100)

Indicator	Δ (%) (Q4, 2020/Q1, 2019)	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Total number of services	–2.6	100	100.2	98.6	100.9	98.4	96.8	97.8	96.1
Total number of weekly country calls	–0.1	100	101.6	101.5	103.7	103.5	101	100.9	101
Sum of operators	–3.9	100	100.6	99.2	100.3	98.6	97.2	96.1	92.7
Max ship capacity (TEU)	15.5	100	100.0	100.0	100	115.5	115.5	115.5	115.5
Total deployed capacity	5.9	100	100.6	101.7	102.7	105.5	105.2	106.4	112.1
Total number of direct calls	–2.6	100	99.3	98.9	100.5	98.8	95.9	98.8	94.8
LSCI	6.2	100	98	98	103	104	105	109	106

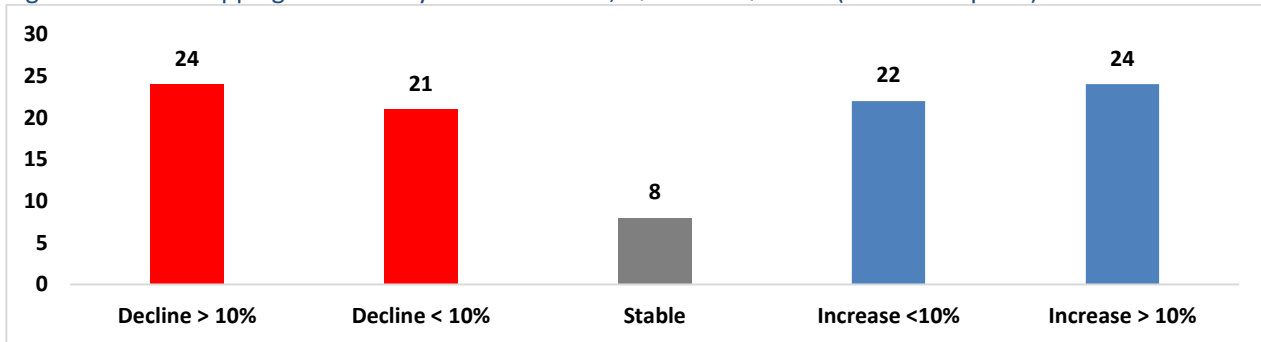
Source: UNCTAD calculations based on AIS data collected and provided by MDS Transmodal (2021).

Figure 25: Liner shipping connectivity, best connected African ports (LSCI, 2006–2020)



Source: UNCTAD calculations based on AIS data collected and provided by MDS Transmodal (2021).

Figure 26: Liner shipping connectivity trends in Africa, Q1 2019–Q4 2020 (number of ports)



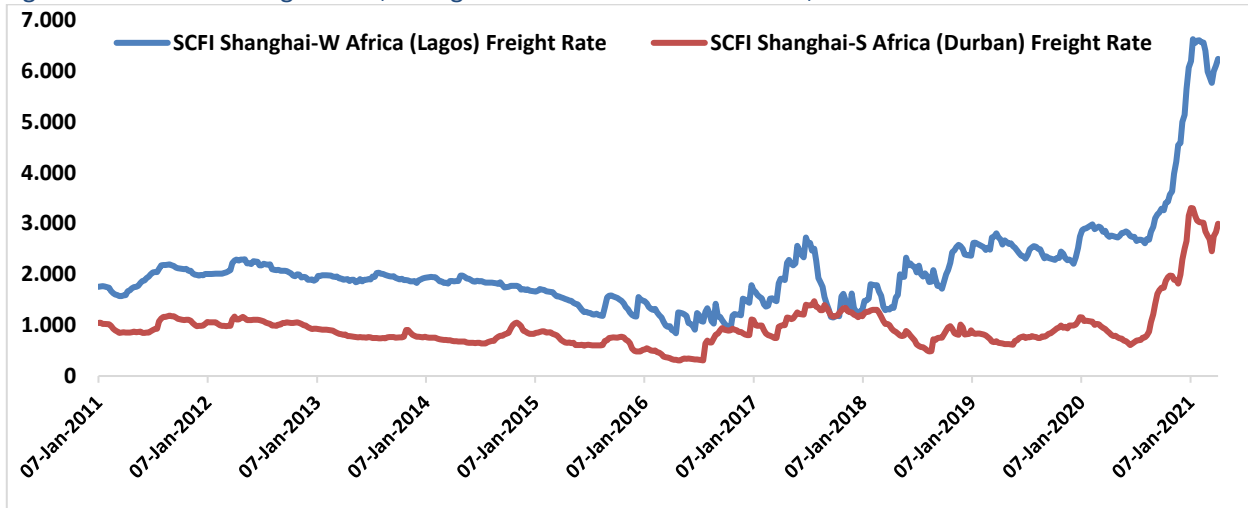
Source: UNCTAD calculations based on AIS data collected and provided by MDS Transmodal (2021).

Freight rates

The manufacturing sector in Africa was hit by the rise in sea freight rates as costs of imported raw materials from international markets soared. Container freight rates around the globe surged due to rapid demand upswing, congestion reducing the velocity of containers, and a contagion effect on other shipping routes as container scarcity increased rates irrespective of whether shipping capacity was fully used. Liner shipping market consolidation that had accelerated over the past decade, carriers’ more disciplined management of capacity, and a fast bounceback in demand post-lockdown all contributed to soaring freight rates and costs.

One-way China-to-Africa container prices were in the range of \$2,000–\$2,500 in 2019, but they doubled to \$4,000–\$5,000 in 2020, before increasing further in 2021 (figure 27). When there is a shortage of containers or ship carrying capacity, freight rates tend to increase. Importers in Africa often have to pay twice for their containers: the journey of the fully loaded containers from, for example, Shanghai to Durban or Lagos, and then the return journey of the mostly empty containers. Consequently, several companies reported having laid off a part of their workforce or adjusted salaries of their employees owing to reduced productivity (*The Maritime Executive*, 2021a).

Figure 27: Container freight rates, Shanghai – Selected African markets, 2011–2021



Source: Shanghai Containerised Freight Index, 2021.

Rerouting of shipping

Africa was also affected by the restructuring of vessel schedules, which increased freight rates. One research relates to the carriers taking advantage of low fuel costs to reroute their services. In April 2020, demand collapsed, and oil prices hit record lows. These led to the falling cost of bunkers and provided container lines incentives to save on canal costs by rerouting many of their services (Baker, 2020). For example, carriers navigated around the Cape of Good Hope to avoid the Suez Canal and its associated costs. With the fees for a 20,000 TEU container ship to transit the Suez Canal costing around \$700,000, the amount saved by rerouting covered the additional fuel costs even on non-scrubber-fitted vessels burning low sulfur fuel.¹⁶

The Suez Canal responded by extending its discount offer for container vessels transiting the canal on backhaul voyages. Ships heading eastbound from the United States East Coast had received discounts since 2016, but these were, for the first time, extended to cruises from Northern European ports destined for terminals east of Port Klang. In addition, vessels whose voyages started in north-west Europe, as far south as Tanger Med and Algeciras, were offered a 17 per cent discount on standard Suez Canal tolls.

A second reason for the increased freight rates was their surge, indirectly, in other parts of the world. Shipping lines started deploying greater tonnage to the more profitable East–West, trans-Pacific and transatlantic trade lanes. Increased consumer demand in the United States supported by stimulus packages and ecommerce boosted rates on these trade lanes. An example is MSC, which shifted some 13,000 TEU capacity vessels from African trading routes favouring the Pacific. The primary reason behind the shift was the high revenue earned along the East–West trade routes, with more shipping lines considering such types of redeployment. This increase was higher than rate indexes estimate, as spot rates do not include the premiums that shippers are willing to pay to secure a booking guarantee.

Alliances continuously shift capacities between trade lanes to adapt to changes in demand even if there are no fundamental changes in direction. With historic port bottlenecks compounded by a surge in freight rates and less service shipping operations, African shippers faced more challenges in liner services.

¹⁶ French carrier CMA CGM was the first carrier to use the longer route on the headhaul westbound route from Asia to northern Europe, but others followed suit, particularly for backhaul voyages. The 2M alliance carriers Maersk and Mediterranean Shipping Co rerouted the last of its suspended AE2/Swan voyages via South Africa, while Evergreen took the Cape routing for one of its return voyages. A number of Ocean Alliance and The Alliance voyages from the East Coast of North America were also routed directly to Asia on the backhaul.

In addition, routes between Asia and North America attracted extra tonnage with impressive capacity growth that does not match actual cargo growth. Carriers needed much more tonnage as ships got stuck in congested ports in both the United States and Asia. Some carriers reported that they needed at least 20 to 25 per cent more fleet capacity to continue carrying the same amount of cargo. This disruption contributed to the lowering of calls around the globe, including in Africa.

Response and mitigating measures

Despite the escalation of COVID-19 cases, maintaining ports open and maritime supply chains functional was a priority. African countries are importers of food and other essential products and the risk of a major disruption to their maritime supply chain would have been challenging.¹⁷ Following a series of initiatives, which extended beyond sanitary measures and teleworking, the majority of African ports and terminals managed to keep operations going and to service at least the essential cargoes.

Following the outbreak of COVID-19, ports and health authorities issued relevant guidelines on COVID-19 preparedness. In South Africa, the government announced a 21-day nationwide lockdown in March, which was later extended to the end of April 2020. Although none of the country's eight seaports were closed, goods coming in from high-risk countries had to be sanitized. This called for changes in terminal operations to scale down transportation services and operations of non-essential cargo, which included the closure of all automotive and multipurpose terminals at the ports of East London, Saldanha, Port Elizabeth and Maydon Wharf in Durban, with a single berth for handling essential breakbulk goods and containers. The intention was to carefully balance preserving public health without compromising South Africa's participation in international maritime trade.

Public administrations and ports collaborated closely to resolve practical issues and communicate the message to all stakeholders. An example is the Nigerian ports that remained operational through the two-week lockdown of Lagos. Immediately after the first cases of COVID-19, the President of Nigeria issued a directive followed by statements of the Nigeria Ports Authority (NPA) to the two main ports of Lagos Port Complex – Apapa and Tin Can Island.

Proactive action was also taken to ensure business continuity and that potential financial impacts were mitigated while taking care of the well-being of staff. For example, the Maputo Port Development Company engaged with all relevant stakeholders to monitor possible operation and business impacts. Consequently, the company adapted and adjusted contingency plans as the pandemic progressed. Measures were not limited to implementing remote working, placing staff on annual leave and maintaining minimum preventive maintenance of equipment and infrastructure; the company also decided to defer non-initiated investments in infrastructure or equipment and negotiate adjustments on the suppliers' contracts (Maputo Port Development Company, 2020).

Mass testing for COVID-19 of workers at work and returning to work was essential for all ports, primarily upon the reopening of any closed terminals (i.e. Sudan). Sanitization and hand washing at the gates and entrance to buildings also had to be maintained. In Kenya a programme kicked off at the Port of Mombasa for the Kenya Ports Authority (KPA) employees, with testing kits deployed to KPA (Kenya News Agency, 2020).

As in several other countries (for example, Nigeria, South Africa), KPA also implemented several measures, including disinfection of key equipment, operations areas, offices, and workshops; social distancing during gang shifts; and modified working practices. KPA put in place strict measures in conjunction with the port health authorities to ensure that all necessary protocols were observed by ships scheduled to call at the Port of Mombasa. Sensitization of KPA employees and the port community was supported through internal communication channels and the local radio stations (KPA, 2020a).

¹⁷ Africa lost its status as a net exporter of food and agricultural products in the early 1980s. In the late 2000s, African countries' agricultural imports exceeded agricultural exports by about \$22 billion. For recent data see FAOSTAT <http://fenix.fao.org/faostat/dev/internal/en/#home>.

Despite all these efforts, the increase in COVID-19 infections in ports in many countries was not rare and disrupted port operations, causing vessel delays to ships operating in the region. In addition, services were disrupted by the outbreak of COVID-19 among the crew on board vessels that had to anchor under quarantine guidelines either in an African country or elsewhere (as far as Hong Kong, China), which disrupted the entire supply chain. In July 2020, ONE announced that the increase in COVID-19 infections in South Africa disrupted port operations in Durban, causing vessel delays to ships operating its South Africa Central service.¹⁸ The same month, Hapag-Lloyd and ONE announced that Asia-South Africa services were disrupted by an outbreak of COVID-19 among the crew on board container ships transiting from China. Another ship deployed on the same route was delayed after a seafarer tested positive. As, in the context of liner shipping companies' agreements, the vessel operated in conjunction with Zim Integrated Shipping Services, the disruption of the supply chain was broader and, not least, beyond the control of decision makers and stakeholders in the continent (Wallis, 2020).

New conditions for approaching vessels and ship-port interface

New conditions for approaching vessels were imposed. In Kenya, from April 2020 ships were required to declare to the port health office within 48 hours before notice of readiness or arrival their crew health status and a voyage memo of the last 10 ports of call. Those that came from countries infected by coronavirus were subjected to rigorous inspection, and crews were not allowed to leave the vessel (KPA, 2020b). Nigeria allowed only cargo vessels that had been at sea for more than two weeks to dock in its ports after the crew had been tested and confirmed disease-free by the port health authorities. In addition, all ships would commence operations after issuing a "certificate of free pratique", which confirms to port authorities that a vessel is free from infectious diseases and can enter a port.¹⁹ These restrictions did not apply to ships carrying oil and gas products because of the minimal human contact on such vessels (Akabogu, 2020).

Special provisions were applied for vessels registered under national flags to facilitate the safe continuation of maritime services. For example, the Nigerian Maritime Administration and Safety Agency extended the validity of statutory and trading certificates for all Nigerian-registered vessels, which included "standards of training, certification and watchkeeping" certificates for seafarers issued by the agency, safety certificates, certificates of medical fitness and other statutory and trading certificates related to SOLAS 1974 as amended by MARPOL 73/78.²⁰ As amended, certificates of ship registry and the Maritime Labour Convention 2006 were also applicable to all sailing on board Nigerian-flagged vessels and foreign-flagged vessels. These measures were taken to reduce the difficulties seafarers were confronted with and served the need to keep them on the job and thus ensure uninterrupted shipping.

Hinterland connections

Restrictions of operations immediately after the start of the COVID-19 outbreak were followed by measures strengthening requirements for international road freight drivers. Additional cross-border controls were introduced to deal with COVID-19 in landlocked African countries.

¹⁸ ONE ships operating its South Africa Central service, including the 4,250 TEU *Cosco Surabaya* and the 4,800 TEU *Zim Shanghai*, were delayed by up to a week before being allowed to berth in Durban due to an increase in virus infections.

¹⁹ Vessels usually obtained a certificate of free pratique on arriving at a berth as a matter of course, and thus valid permission was issued before the inspection. However, where a vessel has called at a port affected by COVID-19, free pratique ceased to be a mere formality, and valid permission could be issued on arrival. A permission could not be issued until a certificate of free pratique was granted.

²⁰ Convention for the Safety of Life at Sea (SOLAS) 1974 as amended by the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78).

In East Africa two central transport routes lead from major seaports in Kenya and the United Republic of Tanzania to the landlocked countries in the African heartland, making the region an important gateway into the whole continent. COVID-19-related driving restrictions generated delays along both the 1,300-km-long Central Corridor that links the Port of Dar es Salaam (United Republic of Tanzania) with Zambia, Rwanda, Burundi, Uganda, and the Democratic Republic of the Congo, and also the 1,700-km-long Northern Corridor that links the Port of Mombasa (Kenya) to Uganda, Rwanda, Burundi, South Sudan, and the Democratic Republic of the Congo. Border crossing points across the region saw longer waiting times and truck queues growing after governments unilaterally changed border processes to curb the spread of COVID-19 (Everstream Analytics, 2020).

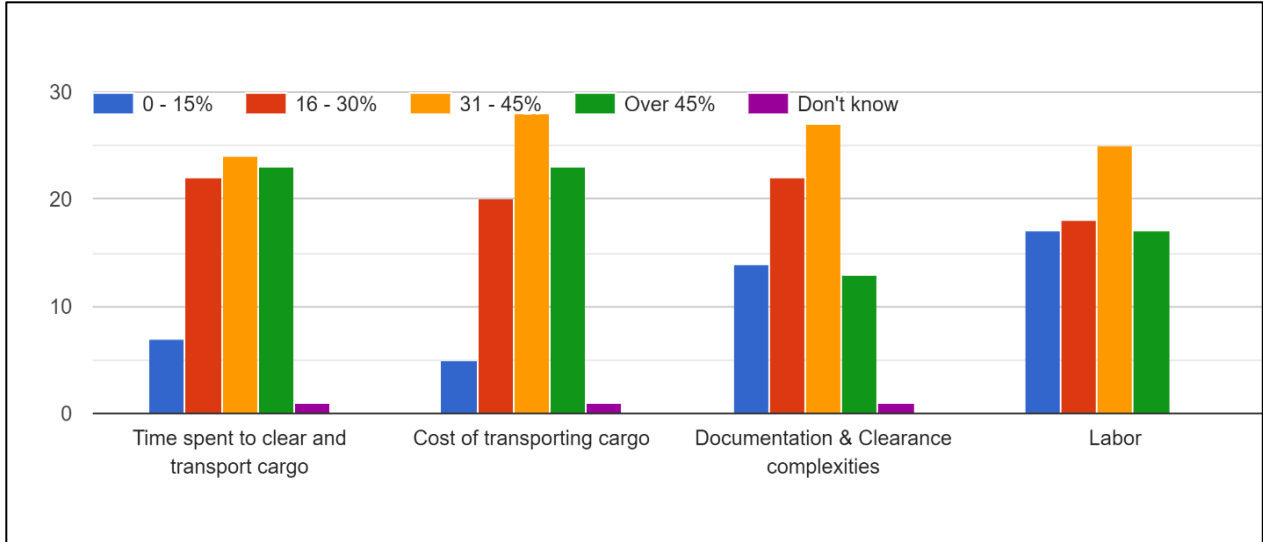
In April 2020, Rwanda banned truck drivers from the United Republic of Tanzania and Uganda from entering its territory. Around the same time, the Central African Republic temporarily banned truck drivers from Cameroon. Zambia closed the central Tunduma–Nakonde border crossing with the United Republic of Tanzania for cargo movement for several days in mid-May. While Rwanda had eased some restrictions on Kenyan and Tanzanian truck drivers by May, the latter country banned all foreign truck drivers from entering its territory in mid-May, requiring all goods to be picked up by a Tanzanian truck at the entry point. Trucks at the borders of Kenya were severely delayed due to the restrictions to enter neighbouring countries. Truck drivers were required to stay in quarantine for 14 days before the trip continued, while operations by many truck companies were suspended due to a shortage of public health staff at borders (Langat, 2021). Administrative problems due to the different approaches of neighbouring countries occurred as cooperation between national administrations during the crisis was somewhat limited, a situation reported by several ports in Africa (Langat, 2021).

Several governments (for example, Rwanda and Kenya) reacted by implementing a relay system on truck drivers, which required foreign drivers to hand over their trucks to a native driver waiting at the entry point to continue the journey to keep cargo moving across national borders. Uganda did not ban any specific drivers from entering. Nevertheless, from early May 2020, the country required all of them to provide a negative COVID-19 test result and continued to debate the implementation of a relay system.

Some governments also changed customs clearance processes resulting in a slowing down of the processing of foreign drivers allowed to enter or leave a country. In April, Rwanda moved customs clearance processes previously only conducted in its capital Kigali to its border crossings. Kenya first introduced mandatory mass testing for its drivers in April 2020 before they left Kenya after several tested positive for COVID-19 in neighbouring countries, but it then extended testing to everyone wanting to enter or leave the country. Uganda implemented a testing regime at its borders in April, while Rwanda followed in May with a similar approach. As a result of these new measures, several border crossings, such as the Busia and the Malaba crossings between Kenya and Uganda, reported truck queues of up to 30 km from mid-April. At the same time, more and more drivers were stuck in border areas across the region for times varying from a few days to a whole week due to processing delays at customs offices. Some drivers reported that round trips had increased from around three days to up to two weeks due to the delays.

In East Africa, the COVID-19 containment measures increased the time, cost, documentation and labour costs. According to a survey contacted by the Shippers Council of Eastern Africa (Figure 28) in late 2020, 62 per cent of transport and logistics players estimated that clearance time had increased by more than 30 per cent and more, while 67 per cent estimated that the cost of transportation had risen by more than 30 per cent. In total, more than 75 per cent of the transport and logistics businesses in East Africa were significantly affected by the COVID-19 pandemic.

Figure 28: Impact of COVID-19 response measures on clearance time and costs in East Africa, 2020



Source: Langat G. (2021) using data from the Shippers Council of Eastern Africa survey of 2020.

There was, for example, a general increase in truck turnaround time for Mombasa–Kampala from 2 to 4 days to a range of 7 to 9 days, which resulted in an increase in transport rates from \$2,100 to \$2,500 and either an extra driver or delay cost of \$100 to \$200 per day (Table 24:). Dwell times at ports worsened – due to a compounded factor of new and revised cargo clearing processes, adjustments of cargo owners’ documentation and delivery delays due to the pandemic – from a range of 94–100 hours in October/November 2019, to 110–129 hours in October/November 2020. Dar es Salaam benefited from the minimal Tanzanian COVID-19 containment measures to record a higher cargo throughput than in 2019 at the expense of Mombasa. The delays on the Northern Corridor of East Africa, especially at the loading ports and exit borders, were brought about by crossing two border points (Kenya–Uganda and Uganda–South Sudan) under strict COVID-19 rules, and transporters using this route had to absorb up to an estimated 48 per cent increase in transport costs. Those using the Central Corridor enjoyed lower transport costs due to the minor COVID-19-restriction-induced delays at border crossings (Federation of East African Freight Forwarders Associations and Shippers Council of East Africa, 2021).

Table 24: Impact of COVID-19 response measures on transit times in East Africa, 2020

	Pre-COVID-19 rates (US\$)	Post-COVID-19 rates (June 2020) (US\$)	Pre-COVID-19 average transit times (days)	Post-COVID-19 average transit times (days)
Mombasa–Kampala	2 100	2 500	2–4	7–9
Mombasa–Kigali	3 400	3 800	7–8	14–16
Mombasa–South Soudan	3 600	4 500	9–10	21–26
Mombasa–Bujumbura	5 000	6 000	9–10	19–20
Mombasa–Democratic Republic of the Congo	6 000	7 000	20–21	30–45

Source: Langat (2021) using data from Federation of East African Freight Forwarders Associations and Shippers Council of East Africa (2020).

In Nigeria, West Africa, some trucks took three months to access the terminals, which were full and had no more space to drop export containers. The infrastructure on the ground could not cope with the volume of cargo accessing the port, and at the same time costs were pronounced as “uncontrollable”. This resulted in exporters hiring barges and berthing by the sides of vessels to load directly from the barges to ships. Such operational inefficiencies at Nigerian ports led to multiple blank sailings. Sub-Saharan Africa's largest economy was unable to overcome persistent inefficiencies in port operations. All these factors had a significant impact on African shippers, and especially exporters that lost significant amounts in perishables and other damaged products due to gridlock at Apapa Port.²¹ These challenges produced shifting maritime trade patterns, allowing other West African ports, servicing far smaller markets, to eclipse Nigeria. Lomé, in Togo, is now, at the time of writing, the region’s busiest port, and cargo destined for Nigeria is increasingly offloaded or shipped via smaller vessels from ports in Cameroon, the Congo, Côte d’Ivoire and Ghana (*Financial Times*, 2020).

In the southern part of the continent, for Maputo, Mozambique, which mainly handles cargo in transit, and 65 per cent of the total cargo comes from South Africa, border restrictions imposed by the South African and Mozambican governments generated enormous challenges. This notably affected the movement of minerals by trucks, the flow of which declined by –37 per cent. Before the pandemic, turnaround time from the South African mines to Maputo port and back was just 25 hours. Under pandemic restrictions, the turnaround time increased to 96 hours. To overcome these challenges the port embarked on digitalization of its processes to reduce operational costs and improve the efficiency of arriving trucks (*AllAfrica*, 2020).

Another notable consequence of the restrictions was the social unrest among truck drivers in the region. Protests broke out at border crossings between the United Republic of Tanzania and Rwanda after the latter banned drivers from the former from entering. Cameroonian truckers protested against COVID-19 restrictions in the Central African Republic and at the Malaba border crossing between Kenya and Uganda. Discontent was also reported among customs officials, who felt increasingly overwhelmed by managing the growing number of trucks waiting to be processed at the borders (Everstream Analytics, 2020).

²¹ Shippers Association of Lagos President, Jonathan Nicol, as reported in *The Maritime Executive* (2021a) citing a report appearing in *The Guardian* (Nigeria).

Warehousing and distribution activities

Warehousing and distribution activities at African ports were altered. In South Africa, for example, port operations operated at 60 per cent capacity during the 2020 lockdown period (Luke, 2020). At the same time, with shippers failing to pick up cargoes, it was soon recognized that the coordination and facilitation of all stakeholders involved along the supply chain would ease the costs of the pandemic for the entire economy. Enabling free storage was part of the deliberate efforts of cushioning customers against the effects of the COVID-19, which affected the whole transport logistics chain.

In Kenya, KPA extended the free storage period for containers at its ports. The original free storage period was introduced in May 2020 for a period of three months and was extended in August based on business dynamics. In November 2020, KPA again announced the extension of the free storage period to its customers, increasing it for domestic export containers from 9 to 15 days and for transit export containers from 15 to 20 days. With the challenges imposed on hinterland transportation continuing, in December KPA announced a further extension for three or six months, depending on location.²²

In Nigeria, NPA directed all terminal operators in March 2020 to extend the suspension of all applicable terminal storage fees on consignments (such as demurrage) for an initial period of 21 days. Following the extension of the lockdown in response to the COVID-19 outbreak, the measure was extended after that every fortnight. This initiative recognized the pressure that the COVID-19 pandemic imposed on businesses and the responsibility falling on the NPA to relieve this burden on its customers and attain the objective of the Government of Nigeria's "ease of doing business policy" at this trying period. The NPA provided compensation to terminal operators as a compensatory relief for this move. On the other hand, public authorities announced sanctions in cases of any form of non-compliance.

Digitalization

Digitizing documents and booking processes, e-business tools and online equipment connectivity emerged as critical elements in increasing the resilience of maritime supply chains and securing business continuity during crises such as the COVID-19 pandemic. Thus, relevant initiatives emerged, with ports ranging from big (such as Tanger Med in Morocco) to relatively small (Cotonou, Benin) introducing increased digitalization (Agence Ecofin, 2021).

Egypt declared a race against time to finalize a national project to modernize and digitize the working system at all ports of entry. To provide a more detailed example, in late 2020 the Nigerian Shippers' Council (NSC) disclosed an acceleration of digitalization in ports in the country, which attained 70 per cent, somewhat lower than the 90 per cent targeted by NSC (NSC, 2020). This was the result of ports and shippers working with shipping companies and terminal operators to ensure improvements. The introduction of monitoring mechanism scorecards in every terminal and shipping company contributed to the improvement. According to NSC, challenges remained however, referring to reforms and claims processes that were primarily manual.

However, at the levels of the maritime sector's automation and technology, several African countries faced a "readiness gap". For example, in East Africa, developing digitalization infrastructure through integration and automation, and upgrading systems from receiving online submissions to complete digitalization was an immediate request of shippers' associations. In addition, integrated border management to include a platform to articulate shippers' needs for better coordination of border crossing procedures was also seen as essential (Langat, 2021).

²² For example, 90 days at Mombasa Port and the inland container depot in Embakasi, Nairobi (ICD-Nairobi); and for six months at the Naivasha ICD, where goods could be stored for free for up to 30 days, transit export goods were allowed 20 days of free storage, up from 15 days previously, domestic exporters continued to enjoy a 15-day free storage period instead of 9 days, while domestic importers were given a 5-day free storage period, up from 4 days.

Pre-pandemic challenges

African ports and maritime supply chains already faced persistent challenges that were not caused by the pandemic but which may have been accelerated or heightened by it. Pre-pandemic challenges that continued to put pressure on the maritime supply chain resilience included, among others, security issues (for example, the primary mining operation Rio Tinto ceased operating at Richards Bay Minerals in South Africa due to an escalation in security issues) and cybersecurity issues (for example, the South African logistics group Transnet declared force majeure at the country's key container terminals following a cyberattack), both being examples of generators of disruptions in African maritime supply chains.

Meanwhile, inadequate infrastructure and maintenance issues, capacity issues, congestion, and hinterland transportation limitations continued to weigh on the prospects of the African transport and logistics sector. The African continent includes 16 landlocked developing countries, and African developing countries continued to lag behind in developing key infrastructure, such as road and rail transportation, with service reliability issues driving up trade costs. The continent continued to grapple with poor quality roads connecting North–South and East–West, a low coverage of paved roads, unstable conditions due to conflicts, and high transportation costs. These pre-existing problems exacerbated the effects of the pandemic (Everstream Analytics, 2020).

The Nigerian Apapa and Tin Can Island ports, the main commercial entry points into Africa's largest economy, illustrate some of these challenges. Amid the pandemic, dock labour could not resume work as scheduled due to the lockdown and curfews. This lowered productivity in both ports and extended the stays of the vessels. Heightened congestion at the port in Lagos increased the costs to truck a container to the Nigerian mainland. As a result, dozens of ships idled at sea, while hundreds of trucks remained in traffic for days or weeks waiting to enter and exit the port, and storage costs added to problems for importers. The Seaport Terminal Operators Association estimated that congestion cost Nigeria \$55 million a day in lost economic activity. Nigerian businesses complained that higher costs were making it hard for them to compete, bearing in mind the African Continental Free Trade Area (*Financial Times*, 2020).

The concerns about operational efficiency in many African ports continued to undermine their resilience in the face of disruptions. A container port ranking study issued in May 2021 by the World Bank surveyed 351 ports worldwide, with no ports in sub-Saharan Africa ranking in the global top 50 (Humphreys, 2021). The Container Port Performance Index 2020 ranks the world's container ports, mainly based on dwell time reflecting the ports' processes and infrastructure. According to this index, Djibouti port ranks the highest of those in sub-Saharan Africa (sixty-first from a statistical point of view and ninety-third from an administrative point of view that also includes expertise and knowledge of local conditions). On the other hand, Durban was ranked the third worst port globally in terms of efficiency, where containers take more than three times as long to load or unload compared with many Asian ports. Ports in East and Southern Africa are considered less than half as productive as similar ports worldwide. Tanger Med (ranked twenty-seventh and fifteenth, respectively) is the notable exception of an African port placed among the higher-ranking ports in the World Bank's index.

Some decision makers realised the need to take measures to try to improve the situation. In South Africa, with the country's container ports ranking among the lowest globally in terms of efficiency, the government decided to proceed to the devolution of the National Ports Authority, which would henceforth operate as a stand-alone business under the aegis of State-owned freight logistics group Transnet (Roelf, 2021).

ASIA

Impacts and challenges

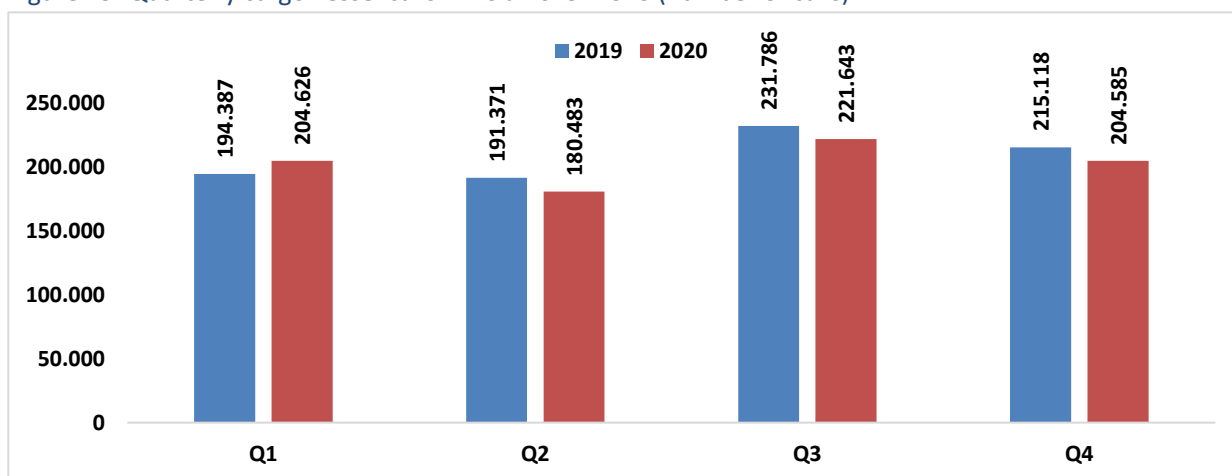
Asia was the first region of the world to be affected by the pandemic and the disruption it has caused. The disruption to the maritime supply chains in Asia occurred in early 2020 with the cases of COVID-19 being reported in Wuhan, China. The disruption affected the “first and the last mile” of China’s and neighbouring East Asian countries’ supply chains. With the spread of the virus in Q2 2020, a rapid drop in global consumer demand occurred in tandem with increased lockdowns and restrictions on mobility and economic activities. Factories were closed, production and consumption were cut, and shippers stopped picking up their cargoes at ports and, whenever possible, cancelled orders from producers in China and other Asian countries.

In 2020, labour shortages were not rare, especially during the first stages of the pandemic (Notteboom and Pallis, 2021). When the number of employees who had to self-isolate increased, supply chains were interrupted. Following the lockdown all major ports in India experienced delays. Although shipping had been deemed an “essential service” by the Indian government, and operations continued, shipments were postponed. Operations slowed because staff were often reluctant to resume work. Operators advocated that they had limited resources to ensure supplies of essential commodities, such as coal, crude oil and containers (Haranadh, 2020). The shortages in most countries were minor and did not last long. By the end of 2020, such shortages were limited to less than 5 per cent of Asian ports (Notteboom and Pallis, 2021).

Total vessel calls

Despite the severity of the initial shock, Asian port vessel calls declined by a moderate –3.8 per cent in 2020, i.e. less than the global decline in vessel calls. Asian ports increased their share of vessel calls in 2020 (41.1 per cent) as compared with the previous year (38.6 per cent). Cargo vessel calls declined by –2.5 per cent. The decline started in Q2 2020, after a strong performance in Q1 when vessel calls increased by 5.6 per cent compared with the same period in 2019. Vessel calls fell by –7.7 per cent in Q2 before moderating to –6.2 per cent in Q3 and Q4. If passenger vessel calls are excluded (figure 29), the decline in Q2 reduces to –5.7 per cent. The decline in Q3 and Q4 was –4.4 and –4.9 per cent, respectively.

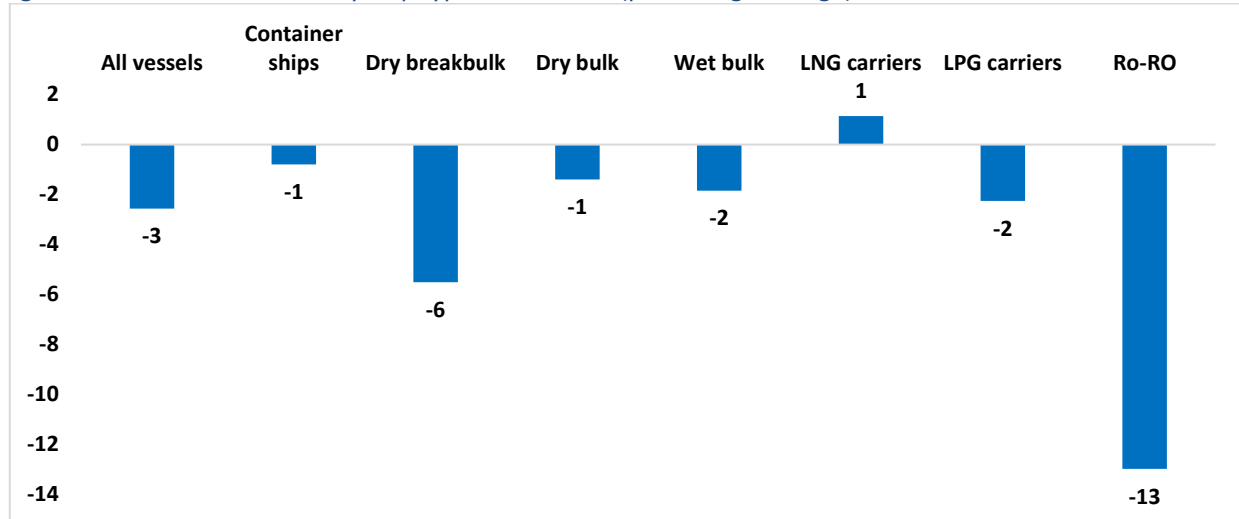
Figure 29: Quarterly cargo vessel calls in Asia 2019–2020 (number of calls)



Source: All types of cargo-carrying vessels; passenger vessels excluded; UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Container vessel calls fell only marginally (–0.8 per cent) in 2020 (figure 30). Dry breakbulk vessel calls declined significantly (–5.5 per cent). Port calls by LPG and wet bulk carriers as well as bulkers declined by –2.3, –1.8 and –1.4 per cent, respectively. LNG shipping performed better than any other shipping markets with calls increasing by 1.1 per cent. Ro-Ro and passenger vessel calls experienced the largest drops of –13 and –12 per cent, respectively (figure 30).

Figure 30: Vessel calls in Asia by ship type, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Note: "All vessels" includes passenger vessels.

Impacts varied across the various Asian regions²³ (table 25) and affected the overall trends in Asia's vessel calls (figure 31). After a positive first quarter, in Q2, cargo vessel calls slumped in South Asia (–21.4 per cent) and South-East Asia (–14.3 per cent). Calls also declined in West Asia (–9 per cent) while East Asia showed more resilience with vessel calls falling by a moderate –2.3 per cent. With the adjustments and the gradual reopening of the Asian economies,²⁴ economic activity restarted. As a result, in Q3 and Q4 of 2020, drops in all vessel calls moderated compared with Q2. South Asian countries saw an increase in vessel calls during Q4 (+0.7 per cent) compared with Q4 2019. Cargo vessel calls in South-East Asia and West Asia also improved and declined less in Q4 2020 (–4.6 and –3.7 per cent, respectively). East Asian countries, which had performed better in Q2 and Q4, experience a larger decline in Q4 (–8.4 per cent).

²³ Asian countries per region: East Asia: China (with Hong, Macao, Taiwan Province of China), the Democratic People's Republic of Korea, Japan, the Republic of Korea; South Asia: Bangladesh, India, Iran, Maldives, Pakistan, Sri Lanka; South-East Asia: Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, Viet Nam; West Asia: Azerbaijan, Bahrain, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, Turkey, the United Arab Emirates, Yemen; Central Asia: Kazakhstan, Turkmenistan.

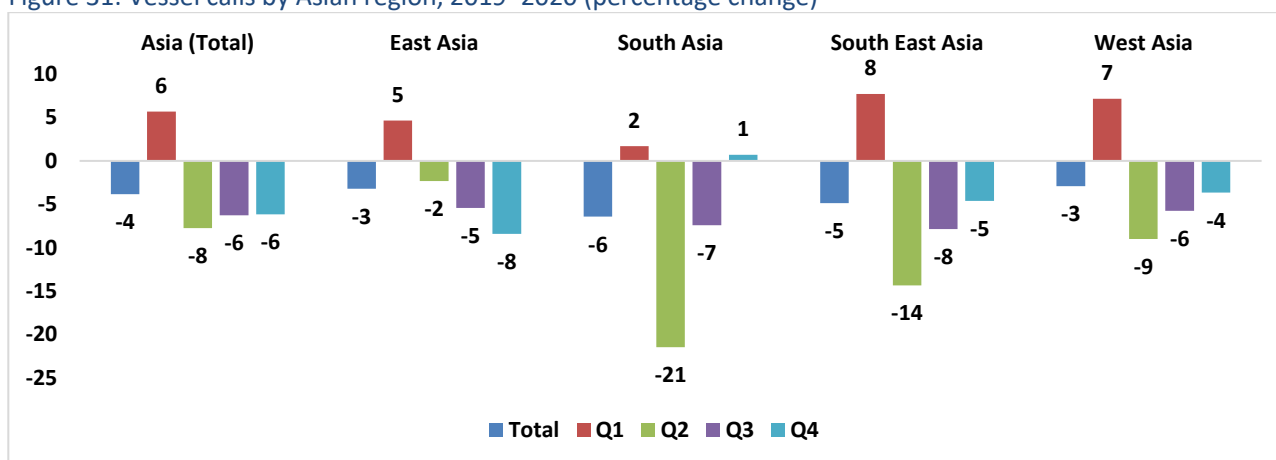
²⁴ The reopening of the economies and social life did not happen in the same periods in all Asian countries. For some it occurred in April (for example, China), for others in mid-2020 (for example, Singapore), and even in the autumn of 2020 (the Republic of Korea).

Table 25: Cargo vessel calls by vessel type in Asia, 2019–2020 (percentage change)

	Container ships (Δ%)	Dry breakbulk (Δ%)	Dry bulk (Δ%)	Wet bulk (Δ%)	LNG carriers (Δ%)	LPG carriers (Δ%)	Ro-Ro (Δ%)	Total (Δ%)
Asia (total)	-0.8	-5.5	-1.4	-1.8	1.1	-2.3	-13.0	-2.6
East Asia	-0.9	-3.7	2.4	-3.5	3.1	0.2	-9.6	-1.4
South Asia	-2.9	-19.5	-6.8	-4.8	21.3	8.5	-12.7	-5.4
South-East Asia	-3.0	-10.6	-8.3	0.9	-6.4	-11.2	-16.7	-4.5
West Asia	5.6	1.5	-4.2	-2.2	0.2	-2.0	-24.8	-2.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Figure 31: Vessel calls by Asian region, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Note: See footnote 23 for regional lists of countries.

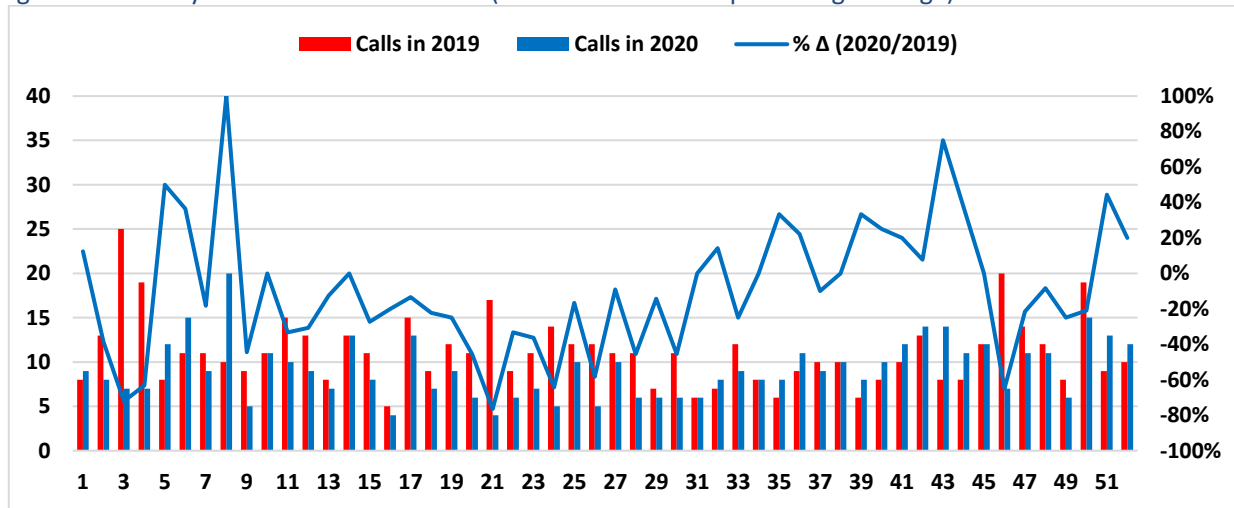
Vessels calling at ports in China increased by 2.7 per cent in 2020. With one third of maritime vessel calls in Asia taking place in China, this was pivotal for the maritime supply chain resilience of the region. Three more major Asian markets – i.e. countries among the 15 in Asia that receive the most calls – also recorded vessel call growth in 2020. These included the Philippines (12.8 per cent), the United Arab Emirates (1.8 per cent) and Saudi Arabia (0.8 per cent). Others saw one-digit declines, including Japan (-5.8 per cent) (which receives the second highest number of vessels in Asia after China), Singapore (-9.8 per cent) and Viet Nam (-2.7 per cent). Vessel calls in Hong Kong (China) (-11.4 per cent), the Republic of Korea (-17.3 per cent) and Thailand (-11.9 per cent) were heavily affected. All in all, the number of vessel calls in the 15 Asian countries that receive the largest number of calls dropped by -3.7 per cent in 2020. These 15 countries handle about 94 per cent of the total vessel traffic in Asia.

Meanwhile, and despite the positive start to 2020, the number of calls to the Caspian Sea countries, such as Kazakhstan and Turkmenistan, declined by -8.6 per cent in Q2 and by -20.6 per cent in Q3 2020. In Q4 2020, this trend continued at a reduced pace (-12 per cent). The 31.5 per cent decline in passenger vessel calls explains the overall negative performance. Dry bulk vessel calls fell by -20.7 per cent while calls by wet bulk vessels contracted by -9.1 per cent.

The two SIDS in Asia (Maldives and Timor-Leste) together experienced a significant decline of vessel calls (-17 per cent) in 2020 (figure 32). The impact of the disruption occurred as early as Q1 and amplified in Q2, with the number of vessel calls dipping by -37.4 per cent. Both the Maldives (-14 per cent) and Timor-Leste (-22.4 per cent) saw a large decline in the number of vessels calling at their ports.

Container vessel calls in the SIDS fell only marginally in 2020 (−0.6 per cent). The negative trend in Timor-Leste (−26 calls) was offset by the positive performance in the Maldives (+25 calls). During the lockdown in Male, the port continued operations with a total of 160 staff stationed at the port to maintain port functions, and a new service from India transporting breakbulk cargo and containers started operating in September 2020. Calls by dry breakbulk vessels decreased by −10 per cent. LNG and LPG carrier calls were reduced by −19 calls compared with 2019, while dry bulk vessel calls were reduced by −37 calls. Changes in the wet bulk segment were marginal (+1 call). Although the absolute number of lost calls is small, the impact was detrimental for SIDS that rely heavily on their sea links for their mobility and access to the global marketplace.

Figure 32: Weekly vessel calls in Asian SIDS (number of calls and percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Container vessel calls

Asian container vessel calls fell by only −0.8 per cent in 2020. The resilience of the market was notable, despite being highly volatile. During Q2 2020, calls declined by −3.2 per cent. In February 2020, the supply shock in China generated the first blank sailings. In March, cargoes scheduled to be transported from East and South-East Asia were further delayed by national lockdowns in destination countries and the reluctance of consignees to collect cargoes.²⁵ As the COVID-19 pandemic forced store closures in major economies around the globe, the suppressed demand induced major apparel brands to reportedly delay and cancel orders. Suppliers in garment-producing countries faced order cancellations, reduced order volumes and extended payment terms, which left many having to reduce operations or stop them altogether. As it is standard practice for brands not to pay for products until after they are shipped, when an order is put on hold or cancelled payments are also held or cancelled.

In April and May 2020, when lockdowns and restrictions on economic activity in Europe and North America undermined industrial production, with consumer and business demand reaching record lows, carriers were withdrawing network capacity on the main trade lanes and idling some of their vessels. For some ports, blank sailings implied more than 20 per cent fewer vessel calls between April and June 2020 (Notteboom and Pallis, 2021). The impact was mainly visible for ports on the main trade routes (i.e. Far East–Europe) and not on other trade routes.

Facilitated by a fast bounceback in demand post-lockdown, China saw its port vessel calls increase in 2020 by 2.1 per cent. The recovery reflected the increased demand for goods in major consumption markets, enabled by e-commerce and the policy support measures by governments (for example, the United States

²⁵ For a list of such cases see <https://www.workersrights.org/issues/COVID-19/tracker>.

and Europe). In Q4, container vessel calls in South and West Asia increased by 1.1 and 8.4 per cent, respectively.

On an annual basis, East Asia, which handled nearly 58 per cent of the total 2020 container vessel calls in Asia, experienced a slight decrease (-0.9 per cent) in container ship calls. China saw more container ships calling at its ports, and Japan sustained similar numbers of calls as the year before. On the other hand, Hong Kong, China (-4.5 per cent) and Taiwan Province of China (-8.8 per cent) were negatively impacted. In South Asia, container vessel calls fell by -2.8 per cent, reflecting the mitigating effect of the performances of India (up 1.2 per cent) and Pakistan (up 10.3 per cent). Container vessel calls in South-East Asia declined by -3 per cent with Cambodia (-9.8 per cent) and Singapore (-6.9 per cent) experiencing the largest drops. Calls in West Asia increased by 5.6 per cent. Growth occurred in almost all countries, except for Georgia (-27.7 per cent), Lebanon (-14.1 per cent), Jordan (-5.1 per cent) and Qatar (-4.3 per cent).

Ten out of the fifteen countries that received most vessel calls in Asia experienced a decrease in container vessel calls. Container vessel calls fell in Sri Lanka (-11.8 per cent), the Republic of Korea (-8.8 per cent) and Singapore (-6.9 per cent). Ports in the Republic of Korea and Singapore receive many intermediate calls of liner operators and services. Therefore, in addition to blank sailing, they suffered from scheduled services departing from China while being fully loaded and not picking up shipment in all ports that had been initially scheduled. In contrast, the United Arab Emirates experienced an increase of 10.1 per cent in 2020, with the establishment of new services linking the country with Israel contributing to this growth. Turkey and Indonesia also experienced a rise in container vessel calls (4.5 and 4 per cent, respectively).

Bulk, breakbulk and Ro-Ro vessel calls

Calls by ships transporting dry breakbulk cargoes in Asian ports declined in 2020 (-5.5 per cent). The number of calls declined in South Asia (-19.5 per cent) and South-East Asia (-10.6 per cent) and East Asia (-3.7 per cent). West Asia saw an increase in breakbulk vessel calls (1.5 per cent).

Of the 15 Asian countries that host the largest annual number of breakbulk vessels calls, 11 recorded a decline in 2020. Singapore (-22.2 per cent), the Republic of Korea (-17.1 per cent), Japan (-8.8 per cent), Indonesia (-4.3 per cent) and Turkey (-2.7 per cent) all saw vessel call declines. The biggest market of all, China, saw its vessel calls increase by 3.4 per cent. The United Arab Emirates saw significant growth (17.4 per cent).

Asian port calls by dry bulk vessels fell by between 1 to 4 per cent in 2020. The impact on East Asia was relatively positive (2.4 per cent), with dry bulk vessel calls in China increasing by 6.6 per cent. A significant drop in dry bulk vessel calls was observed in the remaining Asian regions. At country level, growth was observed in the Philippines (32.6 per cent) and Viet Nam (3.6 per cent).

Five of the fifteen Asian countries/territories hosting the largest annual number of dry bulk vessel calls recorded a double-digit decrease in the number of calls in 2020 over 2019. Ports in Bangladesh (-13.7 per cent), Hong Kong, China (-13.7 per cent), Indonesia (-10.1 per cent), Singapore (-16 per cent) and Thailand (-15.2 per cent) all received less calls by dry bulk carriers in 2020. Indonesia was the only country that experienced a decline in vessel traffic in each of the four quarters of 2020, reflecting the impact of the pandemic but also the export ban affecting dry bulk commodities (Walia, 2021).

Asian port calls by wet bulk vessels declined by -1.8 per cent in 2020. The largest decline was recorded in South Asia (-19.4 per cent) while the lowest was in East Asia (-0.93 per cent). China, which accounts for 20 per cent of the wet bulk vessel calls in Asia, saw its wet bulk vessel calls increase by 10.9 per cent. Calls in Malaysia and Kuwait increased by 6.9 and 6.2 per cent, respectively, while wet bulk vessel calls in the Philippines recorded an upsurge of 63.8 per cent. Meanwhile, wet bulk vessel calls declined in the Republic of Korea, Taiwan Province of China and Thailand across all four quarters of 2020.

Asian port calls by LNG and LPG carriers declined by just –1.1 per cent compared with 2019. This is the second least affected shipping market after container vessels. While port calls by LNG and LPG carriers increased in South Asia and East Asia, South-East and West Asia recorded drops of –9.6 and –1.4 per cent, respectively.

Singapore and Malaysia were hit hard with LNG and LPG vessel calls dipping by –21.2 per cent each. Sri Lanka (–19.5 per cent) and Oman (–14.9 per cent) also recorded double-digit declines. Declines in Japan (–6.3 per cent) and Indonesia (–1.3 per cent) were relatively moderate. Two major markets, China and India, showed resilience throughout 2020 with double-digit growth. Kuwait, Saudi Arabia and Turkey are the other three Asian countries where the calls by LNG and LPG carriers increased.

Asian port calls by Ro-Ro vessels were heavily affected by the disruption, falling by –13 per cent in 2020. All Asian regions experienced significant declines. Japan, which accounts for half of the total Asian market in terms of annual Ro-Ro vessel calls, experienced a minor decline of –3 per cent. On the other hand, 10 of the 15 countries that hosted most calls by Ro-Ro vessels in 2020 suffered double-digit drops. Ro-Ro vessel calls in Turkey were the hardest hit (–40.5 per cent).

Liner shipping connectivity

In 2020, shipping companies deployed larger vessels to and from Asia. The maximum container ship capacity deployed jumped by 12.1 per cent compared with 2019 (table 26). By the end of 2020, the total container ship capacity deployed in Asia was 4.9 per cent more than the beginning of 2019. Meanwhile, during the same period, the total number of services in Asian ports fell by –1.9 per cent. The number of operators fell only marginally (–0.7 per cent). These trends are depicted in the UNCTAD LSCI for Asian countries, which at the end of 2020 was 8.4 per cent higher than at the beginning of 2019. Despite the pandemic, Asia further expanded its connectivity in the global shipping network.

Compared with the beginning of 2019 (Q1 2019 LSCI = 100), the total number of services declined and reached their lowest levels in Q2 2020 (almost 4 per cent lower; LSCI = 96.8). The number of services recovered during the rest of 2020 (Q3 and Q4). By the end of 2020, they had reached the number of services provided in the pre-COVID-19 period (i.e. the beginning of 2019). The same trend was observed for the number of weekly calls, the total number of operators, and the number of direct calls. In all cases, Q2 2020 was marked by a weaker performance than in 2019. Since then, the number of weekly calls in Asia showed signs of recovery. In Q4 2020, they reached the levels of Q1 2019. Meanwhile, the total number of operators in Asia remained lower than in 2019.

As regards the maximum ship capacity, the increase was steady throughout 2020. By the end of 2020, the maximum vessel size (in TEUs) was 16.5 per cent higher than early 2019. The size upsurge of the deployed container vessels compensated for any reduction in the number of services and calls in 2020. By end of the year, the deployed capacity in Asia had increased.

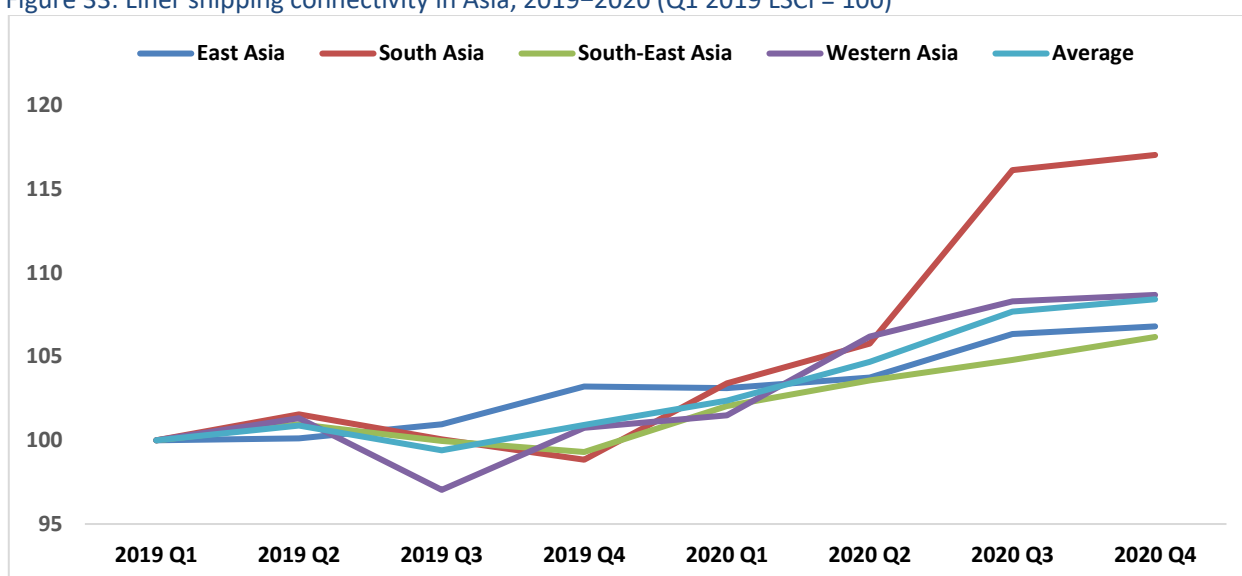
Trends in the LSCI across Asian regions (figure 33) showed improved overall connectivity levels. South Asia saw the highest LSCI.

Table 26: Liner shipping connectivity components in Asia, 2019–2020 (Q1 2019 LSCI = 100)

LSCI component	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Total number of services	100	101.2	100.3	99.8	99.0	96.8	98.1	99.9
Total number of weekly country calls	100	101.5	100.1	99.8	98.6	96.5	97.6	99.5
Sum of operators	100	100.2	99.1	99.8	99.3	99.4	99.8	98.0
Max ship capacity (TEU)	100	100.2	98.3	102.0	105.2	111.4	115.9	116.5
Total deployed capacity	100	103.3	102.5	101.2	101.5	98.4	102.4	104.9
Total number of direct calls	100	100.8	100.1	98.3	98.3	97.7	97.8	97.9
LSCI	100	101	99	101	102	105	108	108

Source: UNCTAD calculations based on AIS data collected and provided by MDS Transmodal (2021).

Figure 33: Liner shipping connectivity in Asia, 2019–2020 (Q1 2019 LSCI = 100)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Disruption to the “first mile”

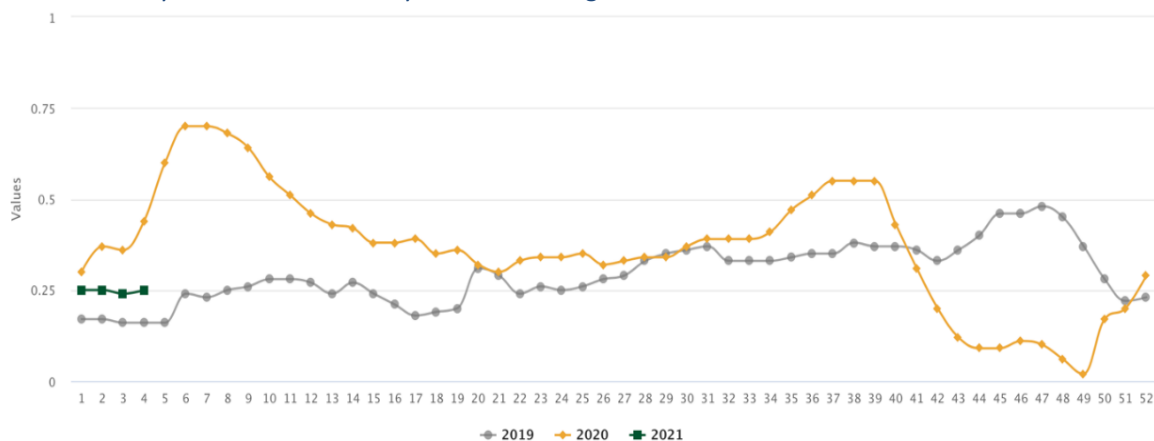
The challenge to the “first mile” of the maritime supply chains resulted from the lockdowns and the restrictions that halted manufacturing activity in Asia. Wuhan, and China in general, are essential manufacturing bases for critical components for several international companies. These include textiles, garments, components for mobile phones and other electronics, and an assortment of medical and pharmaceutical products. Consequently, some of the worst disruptions hit the supply chains for those respective industries, while production in China took a long time to normalize. Only when China’s manufacturing resumed in April 2020 and later in the summer in other countries did supply chains start to function again (Al-Haschimi et al., 2020).

Global brands such as Toyota, Nike and Adidas were forced to close key production sites in China and Viet Nam (Bloomberg, 2021a; *Financial Times*, 2021). In February 2020, Toyota and Honda, Japan's two top car manufacturers, were forced to close plants in Guangdong and Wuhan, respectively (Yoshihiro, 2020). In Thailand also, in March 2020 Toyota had to suspend production at three factories due to a pandemic-related parts shortage (Toyota, 2020). Honda made a downward revision of its sales volume outlook due to new COVID-19 cases around the world but centred around Asia; the impact from a global shortage of chips was also an important factor (Bloomberg, 2021b). Meanwhile, in Viet Nam – one of the world's most essential apparel manufacturers – roughly one third of the country's textile and garment factories closed within a year because of COVID-19 (Chambers, 2021). Electronics firms, including Samsung and Foxconn, also struggled with production due to the lockdown rules across parts of Viet Nam. The south of Viet Nam was in lockdown for nearly a month, with massive ship queues forming in the South China Sea.

A disruption of a different nature affected another maritime economy sector, the ship demolition industry. India experienced severe shortages of purified oxygen due to its second wave of COVID infections, drastically curtailing its ship-recycling activity. With oxygen being in high demand and scarce, industrial oxygen was diverted for medical purposes, thus affecting this sector. With neighbouring Bangladesh and Pakistan also recording a sharp rise in virus cases, ship recycling capacities in these two countries were also hampered. Moreover, since many ports worldwide banned seafarers who had recently visited these countries, it was increasingly challenging to make ship deliveries. As a result, recycling prices increased above their pre-pandemic levels.

Another challenge to the maritime supply chain, in particular to Asian exporters, was the container shortages in Asia, especially China and India. The situation worsened during the second half of 2020 as dwell time in the United States and Europe increased and carriers struggled to return enough empty containers (Worldwide Logistics Group, 2020) (figure 34). The typhoon season also acted as a further cause for the delay in container returns. Vessels were thrown off schedule and forced to skip dropping off empties to avoid bad weather in China, Japan and the Republic of Korea. By the end of 2020 it was clear that the shortage of containers in Asia would last for at least several months more, “driving spot rate markets to historical highs” (British International Freight Association, 2020). The container shortages were so severe in several ports, including the Chinese ports of Xiamen, Ningbo-Zhoushan and Shanghai, that some vessels started leaving Asia without full loads. As containers were not available where they were needed and on time, all ocean-bound trade routes from Asia were short of container equipment, to the extent that some carriers stopped taking bookings.

Figure 34: Weekly container availability index for Shanghai, 2019–2020



Source: Container Availability Exchange (CAx). CAx helps to monitor the import and export moves of full containers around major ports.

Other shipping segments were also disrupted. In China, the lack of Australian coal imports and stricter COVID-19 testing slowed down the turnaround of Capesize bulk ships in some ports, with vessel queues across Chinese anchorages reaching historic levels. As a result, China became host to the top three anchorages globally in total dry bulk congestion. In November 2020, Bayuquan Anchorage faced a queue of 80 vessels, with 19 capes (Chambers, 2020).

Delays and congestion

The 2020 COVID-19 outbreak in China and its impacts on ports further exemplifies the interconnectedness of the world economy and how logistics and trade act as transmission channels that span borders and geographies.

Amid the global congestion, container shortage and rising costs, including service disruption surcharges imposed by shipping lines, the two largest ports in the world in terms of tons handled, Ningbo-Zhoushan and Shanghai, saw tankers, bulk carriers and container ships idled in the East China Sea due to a combination of increased COVID-19 cases, extreme weather, and strong United States demand. The two ports ranked third and first, respectively, in terms of global container traffic, also saw productivity dampened. While Ningbo-Zhoushan and Shanghai had the most significant number of ships at anchor waiting for berth space, the global container port congestion became increasingly worse, with ships backing up across five continents. The disruption at Ningbo-Zhoushan had substantial ripple effects globally as the port operates 260 container shipping routes, including over 100 routes servicing the Belt and Road Initiative (Hand, 2021). Overstretched global supply chains faced further disruptions after a single employee at the port was tested positive for COVID-19, leading the port authorities to turn away ships during attempts to contain further spread of the disease.

Another example of the disruptions, running into 2021, is the situation at Yantian port and the neighbouring Shekou port in southern China. The primary bottleneck appeared at the Yantian International Container Terminal, a key export port to Europe and the United States (*The Maritime Executive*, 2021b). State and port officials implemented stringent restrictions and disinfection routines. More than 20,000 TEU backlogged in the port, with as many as 50 or 60 ships anchored out within a week. The situation deteriorated further as more positive COVID cases were confirmed. When the situation started improving, exports resumed from the terminals with continuing restrictions. The port started operating at approximately 30 per cent of normal capacity. To manage traffic and volumes in the port, officials limited the number of days containers could arrive before their scheduled departure, with shipping lines claiming efforts to mitigate the impact on their clients' supply chain where possible.

Chittagong port in Bangladesh provides an additional example of how logistical bottlenecks can become contagious. Close to 70 per cent of the consignments handled at this port originate from and are destined for the Dhaka region, while the hinterland connection depends on road transportation and, to a lesser extent, on rail and inland waterways. To fend off the pandemic, the government announced "a general holiday" for three weeks (26 March–11 April 2020). Importers could not ship their cargo due to shortage of vehicles. Approximately 5,000 transport vehicles typically entered the port for deliveries and shipments daily. This number was reduced to 800–1,000 as the drivers were not keen to drive for fear of COVID-19. As customs and banking operations ran on a limited scale, cargo piled up at the port (Mannan et al., 2021).

Viet Nam faced similar challenges. Ho Chi Minh's largest international terminal suspended some operations and almost stopped receiving cargo ships entirely before managing to clear its yard and reduce the backlog. The operator (Saigon Newport Corporation) took measures as the container yard had reached 100 per cent of capacity. At the same time, staffing was reduced by half due to COVID-19 cases (*Insurance Marine News*, 2021) while the city remained in lockdown. After three weeks of operation during the virus surge the outbreak had created a shortage of port officers, forklift drivers, and truckers entering the port to move containers. Vessels were forced to wait on berth due to a lack of workers. The terminal stopped handling reefer boxes and trans-shipments and held this suspension for two weeks. In addition, handling operations of extra-long, extra-heavy, oversized or overloaded cargoes were suspended at the terminal.

The operators encouraged carriers and their customers to adjust schedules and shift loads to alternate ports. They also requested all incoming ships to notify the port in advance of the estimated volume of import containers and empties on the vessel two weeks before arrival. The terminal operator also asked Vietnamese customs officials for permission to move containers waiting more than 90 days in the port to inland container depots to create space and allow minimal interruption due to yard space scarcity.

India's port efficiency was also affected as shown by the case of Jawaharlal Nehru Port Trust. Container dwell times – defined as the time taken for exports inside terminal gates to be loaded onto a ship and imports onto a truck or train – increased amid cargo clearance slowness following truck capacity shortages and warehouse closures. Jawaharlal Nehru Port Trust, which commands the bulk of Indian containerized trade, took an average of 34.6 hours in the April–July period, compared with a turn time of 33.6 hours a year before, for the processing of a container. Longer dwell times caused harbour congestion while forcing cargo owners to face additional demurrage and storage fees – the subject of ongoing legal activity between importers and warehouse managers (Bency, 2020a).

The domino effects of the increased berthing times in major Asian ports combined with the similar delays at ports at the other end of the supply chains (for example, at Southern Californian ports of Los Angeles and Long Beach) lasted for more than a few weeks. Growing congestion at major Chinese ports (for example, Ningbo-Zhoushan and Shanghai) increased the number of ships at anchor, generating delays at Chinese origins. The reliability of maritime services has been affected by the deterioration of carrier on-time performance. The eastbound trans-Pacific services reliability declined (Mongelluzzo, 2021).

Response and mitigation measures

Business continuity and operational adjustments

Most Asian ports sustained their operations throughout the pandemic, as port authorities, service providers, and all stakeholders focused on avoiding halting operations. Implementing safety and health protocols, and port operational adjustments, were the first measures taken. Moreover, governments provided exceptions to transportation and some other essential service sectors to facilitate these adjustments when making decisions on lockdowns. Measures to put into effect immediately were the implementation of protocols that State authorities made mandatory, the application of related sanitary measures, and the implementation of teleworking for administrative personnel. All these measures sought to ensure continuous operations and the servicing of at least essential cargoes. In addition, terminal operations were redesigned to secure social distancing.

Malaysia, for example, provided exemptions for transport workers when it issued the “movement of control order” that restricted the movements of citizens in spring 2020. In Jordan, the Jordan Maritime Commission issued guidelines for all workers in the maritime sector (Jordan Maritime Commission, 2020). The Maritime and Port Authority of Singapore (MPA) worked on continuously adapting working practices (MPA, 2020a). Chittagong port in Bangladesh distributed the workforce across three groups, introducing a rotation and rostering system; each group worked for one week, went into quarantine, and returned to work the fourth week. Progressively – and due to personnel vaccination – digital health documents were issued to better monitor and control the situation.

Measures adopted at Asian ports to keep operations going included: (a) initiatives such as allowing cargo to be transported directly to manufacturing plants without entry into the terminal to avoid delayed unloading; (b) providing storage space at seaports (c) strict quarantine for vessels arriving from countries affected by the pandemic and for the crews disembarked. While the loading and unloading of some ports was delayed, most countries managed to maintain normal port operations due to strict application of these measures (United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), 2020).

Customs planning adjustments were also implemented. In China, customs implemented a command centre and a working group to coordinate border efforts and provide solutions to COVID-19-related issues (China Customs, as reported on the World Customs Organization website, 2020). Detailed policies and measures on faster clearance, minimum-interference customs control, certification services, and acceleration of market access processes for imported products were provided. In Chittagong Port, Bangladesh, the National Board of Revenue issued an official order allowing direct transfer of shipments to private inland container depots from a previously fixed 38 types of goods to apply to all types of products (Mannan et al., 2021).

An inclusive approach that extended beyond the port remit to include and benefit other stakeholders across the maritime supply chain was also adopted. For example, Abu Dhabi Ports constructed COVID-19 testing facilities at both Zayed and Khalifa Ports. Accessible to all Abu Dhabi Ports employees, contractors and subcontractors active in the ports, the facilities were intended to be able to process up to 700 tests daily. Housing medical diagnostic equipment for detecting COVID-19, the facilities were fully staffed by qualified medical personnel and it was hoped to conduct 6,000 tests in the days following the opening (Abu Dhabi Ports, 2020). For operations to continue, it was essential to secure workers throughout the entire supply chain, not only port workers, drivers, and seafarers. The Philippines Port Authority participated in an Inter-agency Task Force for the Management of Emerging Infectious Diseases, created by government executive order, and attended several meetings on the novel coronavirus, intending to harmonize action plans for all agencies that coordinated the management of the pandemic in the country (Philippines Port Authority). Details of protocols to be applied were provided by the national administration, particularly the Department of Health, and the Port Authority implemented the measures that had to be taken. In addition, it developed a particular section of its website to provide updates on COVID-19 and the measures taken to avoid related disruptions.

Public authorities determined to a large extent the conditions for workers involved in maritime transport. For example, in China, public authorities ordered mass testing, with port authorities also required to ensure that ship crews and port workers were tested. In the second half of 2020, most ports in the country required PCR tests for all crew, with vessels forced to remain at anchor until negative results were confirmed. Many ports in the country also required vessels to quarantine for 14 to 28 days if they had previously berthed in India or performed a crew change within 14 days of arriving in China (UK P&I, 2020). However, despite various efforts to maintain business continuity, in some cases lockdowns made it difficult for workers to reach their jobs at the terminals. For example, Adani Group, a private conglomerate, declared force majeure in all its 10 ports and terminals in India due to country's lockdown constraining operations (*The Economic Times*, 2020).

Once vaccines were made available, prioritizing vaccination for port workers – as well as for seafarers and other frontline maritime personnel – was essential for many Asian countries. Singapore prioritized maritime personnel to receive vaccinations. Over 10,000 maritime personnel had been vaccinated for COVID-19 by the end of January 2021, which the Singapore authorities called the Sea–Air Vaccination Exercise. The programme prioritized port workers, harbour pilots, cargo officers, marine surveyors, and marine superintendents. The programme included people involved in navigation, refuelling, ship repair, maintenance, and cargo handling. Harbour craft and ocean-going crews who were Singaporeans and long-term residents were also on the list for vaccination.²⁶

Measures were also taken to handle “priority goods”. These included fast clearance of supplies required to fend against the pandemic. In China, for example, for imported supplies, all local customs were required to open exclusive counters and green lanes 24/7 to ensure fast clearance, with imported pharmaceuticals, disinfection supplies, protective suits, treatment equipment, and other supplies released without delay. For exports, green lanes were also provided 24/7 to minimize the clearance time. In addition, a no-stop, no-check, toll-free policy for vehicles transporting emergency supplies and essential personnel was put in place.

Public policies also dictated trade conditions and cargo clearance at ports. For example, China increased its checks on reefer shipments, leading to considerable delays at several ports (Jiang, 2020). Following instructions issued by local authorities, all reefer shipments to Tianjin were required to complete an inspection and test for COVID-19 before release, resulting in reefer plugs in the terminal facing severe shortages and vessel berthing schedules being postponed. Shanghai and Tianjin, major cold-chain hubs and the largest frozen product import ports in China, tightened inspections on imported frozen products according to the instruction from epidemic control authorities. Customs clearance time for frozen products increased substantially with several extra clearance procedures. Subsequently, shipping lines (for example, Hapag-Lloyd) diverted reefer cargoes to alternative ports such as Qingdao, Dalian, and other Chinese ports, and kept some cargo at Busan in the neighbouring Republic of Korea.

Governments intervened to enable congestion at ports to be cleared by diverting containers inland. When India entered its third week of a 21-day lockdown in 2020, the Indian government asked container terminal operators and ocean carriers to act together to suspend penalties and ground rent charges on containers caught up in the lockdown (Bency, 2020b).

Flexibility was an important feature of response measures when deemed necessary not only to contain the pandemic but also the port and maritime supply chain disruption. For example, when managing quarantines for cargo ships, India had to lift a 14-day COVID-19 quarantine for inbound vessels from China and other shorter-haul routes implemented in March 2020 to ease widespread sailing disruptions that harmed inventory flow. It was only after that policy modification that service reliability improved, waiting time for berthing of a vessel was reduced, and carriers reconsidered the levying of a “sea priority surcharge” per container.

²⁶ Singapore's vaccination programme for the maritime sector came as the British Ports Association also called for essential port workers to be given priority during the roll-out of the coronavirus vaccine. Private companies had recently begun to offer free vaccination to seafarers at the German ports in Hamburg and Bremerhaven as well as ports in the Netherlands.

Hinterland connections

Supporting a model shift to keep trade flowing, China for example, indicated support for the operation of freight train services, in particular the China–Europe ones. As China–Europe freight train services run in segments and do not involve personnel quarantine inspection, they became an essential logistics channel to ensure smooth trade between China and Europe and the transport of medical supplies. Initiatives supporting these long-distance cargo trains included working with cross-border e-commerce firms to conduct commercial activities such as bonded warehousing, goods distribution, picking, and packaging services with China's vast related areas to expand its service range.

Port cooperation

Collaboration and coordination intensified during the pandemic. Several Asian ports interacted institutionally and regionally while focusing on strategic dialogues with government and other stakeholders through professional-sector associations. As detailed in the overview to the present report, in April 2020, with a virtual declaration, 20 leading ports from around the world vowed to keep their ports open during the ongoing pandemic (see Overview section, Cooperation and dialogue). The Port Authorities Roundtable members decided to collaborate and share best practices in ensuring that port operations could remain undisrupted.

Meanwhile, response measures by shipping carriers included offering “premium services” to mitigate the impact of the congestion and delays on service reliability (Mongelluzzo, 2020b). They sought to reposition empty containers by reducing free storage time at warehouses at the destination, denying export bookings to quickly turn the containers. Faced with terminal congestion and vessel delays (+14 days), and the prospects of continuing backlogs and uncertainties, all the major shipping companies skipped calls at disrupted ports (for example, Yantian port) to minimize the impact on vessel schedules.

Digitalization

Using digital tools and digitalizing exchanges accelerated in 2020 to secure paperless interactions along the maritime supply chain and secure minimal transition of the virus. Busan Port Authority advanced further its port group systems and related portal, enabling a blockchain technology-based logistics portal system to limit physical interactions between ports and users (World Bank, 2020). Meanwhile, Abu Dhabi Ports started collaborating more, “no longer by choice but by necessity”,²⁷ with this necessity driven by the optimization of the supply chain and customers looking for that kind of connectivity. Saudi Global Ports operating Dammam Port focused on deepening collaboration with partners further up the supply chain, and directly with customers, while strengthening digital partnerships.²⁸ In Singapore, efforts towards “smart port operations” – developed in partnership with the Singapore Logistics Association – continued while seeking to better understand how to advance port operations and technology, data-driven smart port operations, including digitalization and technological trends, and the demand for new skill sets to minimize risks of disruption. Meanwhile, the Indian Ports Association, under the aegis of the Ministry of Shipping, took steps towards digitizing some of the trade-related processes through the Port Community System to integrate the electronic flow of trade-related documents and information. The aim was to function as the centralized hub for the ports of India and all concerned stakeholders (UNESCAP, 2020).

²⁷ From interview with R. Sutton, Chief of logistics, Abu Dhabi Ports, in a report of *The Loadstar*: “Wider digitalisation has been forced upon ports by Covid pandemic”, 17 December 2020.

²⁸ From interview with E. Tah, CEO of PSA subsidiary Saudi Global Ports (SGP), in a report of *The Loadstar*: “Wider digitalisation has been forced upon ports by Covid pandemic”, 17 December 2020.

Financial support

In the early stages of the pandemic several of the largest container lines received financial support from their governments or had direct State ownership interests, with the Republic of Korea being the second-largest donor of maritime state aid, after France. Singapore's MPA provided a financial aid package to support the local maritime sector (MPA, 2020b). Together Package provided approximately \$27 million to maritime companies, Singaporean seafarers and individuals. The package included a 30 per cent port dues concession for cargo vessels and all non-passenger-carrying harbour craft in the Port of Singapore from May 2020 through to the end of the year, a 100 per cent waiver of public licence fees for passenger terminal operators for the fiscal year 2020, and a discount for port concessions for ocean-going vessels with a port stay of not more than five days. MPA also introduced new workforce schemes and increased the co-funding provided under selected Maritime Cluster Fund programmes over the same period and increased its co-funding support under the fund schemes to up to 90 per cent. Additionally, MPA rolled out a seafarers' relief package for eligible Singaporean seafarers who could not secure shipboard employment between 1 May and 31 July 2020. Finally, it also announced the extension of credit terms allowed (MPA, 2020c).

In Thailand, the ports authority offered discounted fees and more lenient credit terms to customers to ensure business continuity. In addition, they reduced special fees for fuel usage of the container and tug boat services both at Bangkok Port and Laem Chabang Port by 5 per cent, effective from May 2020, and extended the grace period for payment of invoices from the original 15 days to 45 days (Thaiger, 2020).

Some governments reversed fiscal policies to support recovery. For example, India announced support measures focused on road infrastructure, which was expected to boost dry bulk shipping by increasing demand for raw materials. Japan provided a \$3 trillion stimulus package, including the funds announced at the end of 2020 and focusing on green and digital innovation, which was expected to boost container volume in intra-Asian trade. Government fiscal spending that boosts consumption also, therefore, supports maritime trade and transport.

LATIN AMERICA AND THE CARIBBEAN

Impacts and challenges

In March 2020, most countries in the LAC region declared a state of emergency and called for general preventive isolation measures or enforced quarantines and lockdowns. National administrations imposed entire or partial temporal closures of control posts at the borders, allowing authorized border crossing only. Other countries prohibited the entrance of nationals of other countries. Although measures did not necessarily apply directly to border trade, they eliminated cross-border movements of trucks and cargoes. In some cases cargo transport was allowed but only through authorized border points, which delayed the entire logistics process (Rivera, 2020).

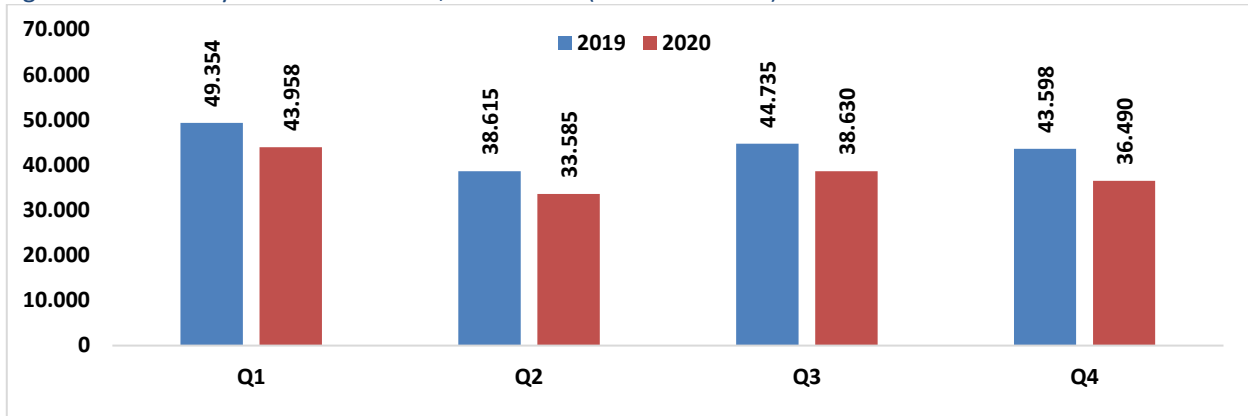
The restrictive measures limited economic life, imposed social distancing and affected trade. The LAC countries saw their imports and exports decline by –33 and –21 per cent, respectively, during Q2 2020 (UNCTAD, 2020d). From March 2020 until the end of the year, the weekly number of vessel calls declined as compared with the equivalent period in 2019. Within the year, countries in the region hosted together 152,663 vessel calls, or 6.8 per cent of global calls. This share stood at 7.1 per cent of the respective global total in 2019. By the end of 2020, total vessel calls had fallen by –13.4 per cent, compared with 2019, i.e. greater a reduction than world averages.

Total vessel calls

The absolute number of vessels calls fell in all quarters of 2020 (figure 35). Double-digit declines were observed during Q2 2020. While vessel calls also declined in Q1 (–10.9 per cent), factors other than the pandemic were at play (figure 36). The pandemic, which reached the region relatively late compared with other parts of the world, led to a fall in total vessel calls by –15 and –15.8 per cent, respectively, in Q2 and Q3 2020. Unlike other regions, the negative trend intensified in Q4 2020 (–16.3 per cent).

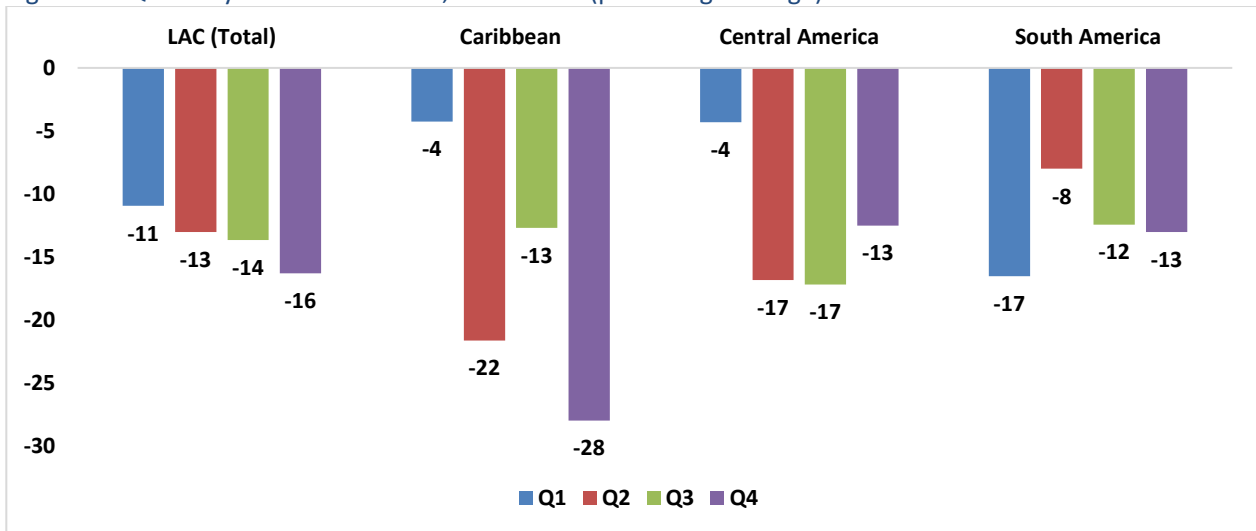
While container vessel calls dropped by –4.3 per cent, they performed relatively better than other shipping markets (figure 37). The Ro-Ro sector recorded the largest decline in vessel calls (–16.8 per cent). Calls by vessels carrying dry breakbulk, wet bulk and dry bulk fell by –14.8, –10 and –8.6 per cent, respectively. Meanwhile, calls by LPG carriers declined by –5.3 per cent while LNG increased their port calls by 3.2 per cent. Passenger vessel calls declined by –48.3 per cent. The impact of the pandemic in the LAC region was exacerbated by the pre-existing situation in many countries that was marked by heightened social and political unrest. Furthermore, the economic effects of the 2008/2009 crisis on LAC had never completely disappeared (Barleta and Sánchez, 2021).

Figure 35: Quarterly vessel calls in LAC, 2019–2020 (number of calls)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Figure 36: Quarterly vessel calls in LAC, 2019–2020 (percentage change)

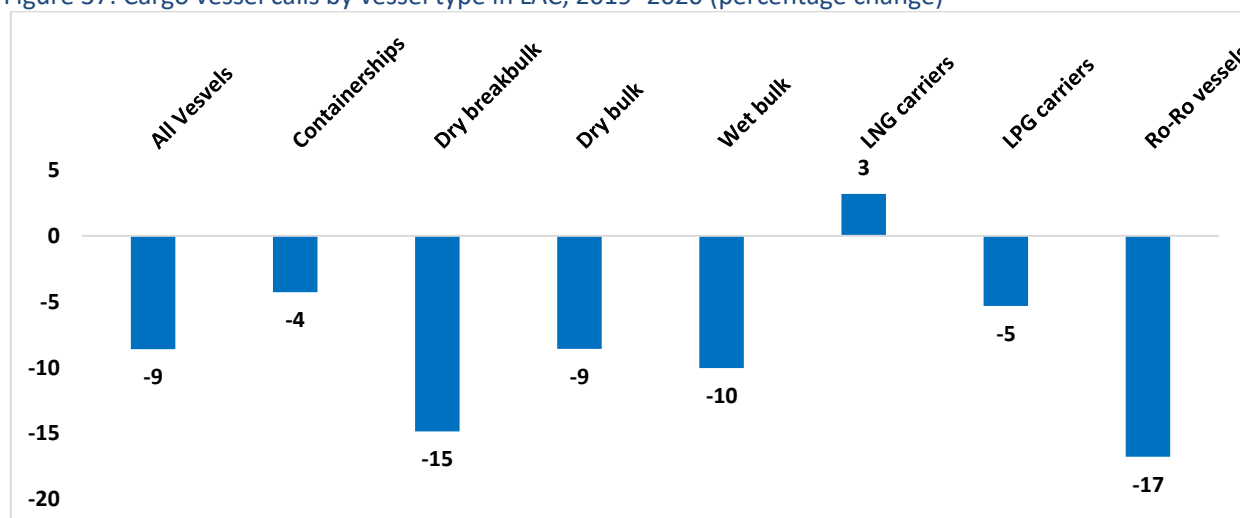


Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Note: Caribbean: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados; Bonaire, Sint Eustatius and Saba; the British Virgin Islands, the Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saint Martin, Saint Barthélemy, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Trinidad and Tobago, the Turks and Caicos Islands, the United States Virgin Islands; Central America: Belize, Costa Rica, El Salvador, Guadeloupe, Guatemala, Honduras, Mexico, Nicaragua, Panama; South America: Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, the Falkland Islands, Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay.

Within the region, the Caribbean was relatively more affected. Vessel calls declined by –22 per cent in Q2, before declining further in Q4 of 2020 (–28 per cent). In 2020, annual vessel calls declined at similar rates in both Central (–12.5 per cent) and South America (–12.7 per cent). Performance also diverged by vessel type (table 27). Container vessel calls fell in Central (–4.1 per cent) and South America (–7.2 per cent) but increased in the Caribbean (2.5 per cent). Port calls by dry bulk and breakbulk vessel calls fell significantly in the Caribbean (–17.7 and –18.4 per cent, respectively). In South America, calls by these vessel types declined each by –16.8 and –8.4 per cent, respectively). In Central America, calls by dry bulk and breakbulk vessels respectively fell by –5.3 and –4.8 per cent. The drop in port calls made by wet bulk carriers was lower in the Caribbean compared with South and Central America. Calls by LNG carriers continue to increase in the Caribbean and South America but were halved in Central America. Only South America experienced a decline in its LPG carrier port visits in 2020 (–14 per cent).

Figure 37: Cargo vessel calls by vessel type in LAC, 2019–2020 (percentage change)



Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 27: Vessel calls by vessel type and subregion in LAC, 2019–2020 (percentage change)

	All vessels (Δ%)	Container ships (Δ%)	Dry breakbulk (Δ%)	Dry bulk (Δ%)	Wet bulk (Δ%)	LNG carriers (Δ%)	LPG carriers (Δ%)	Ro-Ro (Δ%)
LAC (total)	-8.6	-4.3	-14.8	-8.6	-10.0	3.2	-5.3	-16.8
Caribbean	-4.7	2.5	-18.4	-17.7	-3.3	11.5	8.6	-11.0
Central America	-6.8	-4.1	-4.8	-5.3	-9.4	-42.6	7.4	-16.1
South America	-10.5	-7.2	-16.8	-8.4	-12.4	5.7	-14.0	-22.4

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

In 2020, the 15 LAC countries with the largest number of annual vessel calls performed slightly better than the entire region. Overall, their vessel calls fell by -12.6 per cent. Bahamas (-28.8 per cent), Uruguay (-25.7 per cent), the Bolivarian Republic of Venezuela (-22.4 per cent) and Peru (-20.4 per cent) all experienced double-digit decline rates. Declines in Brazil, Guatemala, Jamaica, Panama, and Trinidad and Tobago were more moderate. Vessel calls in Trinidad and Tobago were the least impacted as they remained practically unchanged. Among the LAC countries that receive at least 100 calls per year, the British Virgin Islands, Cayman Islands, and Turks and Caicos Islands recorded significant drops in vessel calls. While the decline in some other countries may have been small in absolute numbers, as few ships call at these countries per year, any reduction in these calls would have been challenging. In 2020, Montserrat registered only 13 calls (-55.2 per cent) while Anguilla received 11 calls (-83.6 per cent reduction). Meanwhile, vessel calls increased in Haiti (10.1 per cent), Barbados (7.1 per cent) and Curaçao (2.7 per cent) in 2020.

The region's SIDS experienced a significant decline from the early days of the COVID-19 crisis. After a marginal drop in Q1 2020 (-1.3 per cent), vessel calls dipped in Q2 (-18.1 per cent), improved slightly in Q3 but slumped in Q4 2020 (-31.2 per cent) (table 28). In total, amidst the COVID-19 crisis SIDS in the region experienced a decline of vessel calls by -15%. Container vessel calls increased by 6.5 per cent. In contrast, calls by vessels carrying dry bulk and breakbulk cargo declined by -25.3 and -19.4 per cent, respectively. Wet bulk, LNG, LPG and Ro-Ro vessel calls declined at a more moderate rate of -5 per cent, -7.6 and -8.8 per cent, respectively. Tables 28–30 illustrate the large variations across selected Caribbean SIDS.

Table 28: Vessel calls in Caribbean SIDS, 2019–2020 (percentage change and number of calls)

	2020	2019–2020 (Δ%)	Q1 (Δ%)	Q2 (Δ%)	Q3 (Δ%)	Q4 (Δ%)
2020	16 721	-15.0	-1.3	-18.1	-10.9	-31.2
Container ships	4 513	6.5	16.0	11.3	4.2	-5.0
Dry breakbulk	1 502	-19.4	-23.5	-33.0	-13.6	-9.6
Dry bulk	727	-25.3	-33.5	-32.9	-15.4	-18.8
Wet bulk	4 084	-5.0	5.6	-10.3	2.3	-18.0
LNG & LPG carriers	852	-7.6	-2.5	-10.0	4.3	-23.3
Ro-Ro	719	-8.8	-2.5	-1.7	-17.5	-12.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 29: Vessel calls in selected Caribbean SIDS, 2019–2020 (percentage change and number of calls)

	2020	2019	Δ 2019– 2020	2019–2020 (Δ%)
SIDS in LAC	16 721	19 670	-2 949	-15.0
Antigua and Barbuda	476	675	-199	-29.5
Bahamas	3 959	5 638	-1 679	-29.8
Barbados	1 165	1 088	77	7.1
Dominica	239	316	-77	-24.4
Grenada	318	466	-148	-31.8
Jamaica	3 951	4 287	-336	-7.8
Saint Kitts and Nevis	403	699	-296	-42.4
Saint Lucia	836	1 056	-220	-20.8
Saint Vincent and the Grenadines	421	487	-66	-13.6
Trinidad and Tobago	4 953	4 958	-5	-0.1

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Table 30: Container vessel calls in LAC SIDS, 2019–2020 (percentage change and number of calls)

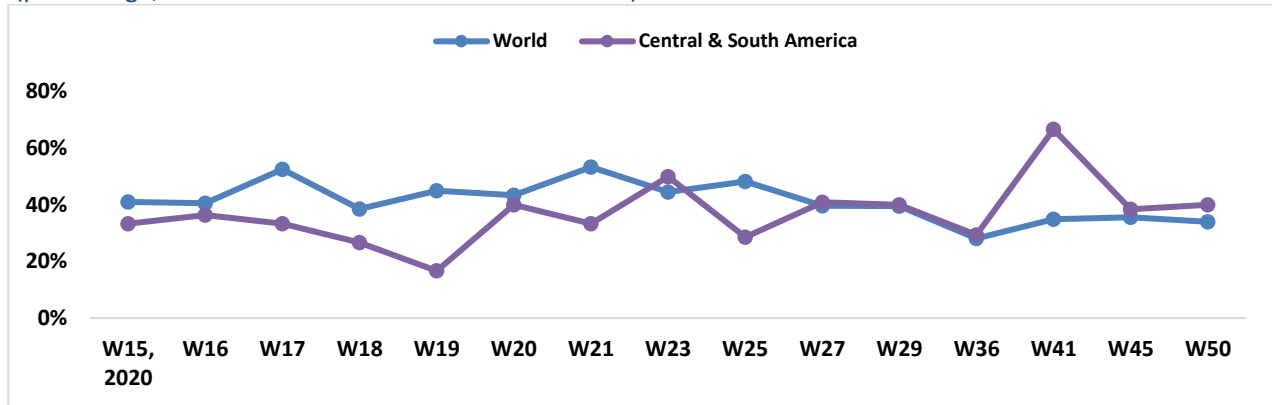
	2020	2019	Δ 2019– 2020	2019–2020 (Δ%)
SIDS in LAC	4 513	4 239	274	6.5
Antigua Barbuda	91	88	3	3.4
Bahamas	1 053	1 021	32	3.1
Barbados	280	246	34	13.8
Dominica	95	83	12	14.5
Grenada	142	163	-21	-12.9
Jamaica	1 514	1 336	178	13.3
Saint Kitts and Nevis	102	120	-18	-15.0
Saint Lucia	159	151	8	5.3
Saint Vincent and the Grenadines	164	178	-14	-7.9
Trinidad and Tobago	913	853	60	7.0

Source: UNCTAD calculations based on AIS data collected and provided by Marine Traffic (2021).

Container vessel calls

Ports in South and Central America experienced a decline in container vessel calls in 2020 (figure 38). The situation did not differ remarkably in the Caribbean. As a result, LAC container vessel calls declined by –4.3 per cent in 2020.

Figure 38: Ports in Central and South America with over –5 per cent drop in container vessel calls (percentage; weeks 15–50 2020 cf. weeks 15–50 2019)



Source: Notteboom and Pallis (2021).

Container vessel calls fell by –7.2 per cent in 2020 in South America, a trend that had started before the pandemic. In Central America, the decline started in Q1 2020 and intensified in Q2 and Q3 before recovering in Q4. In contrast, container vessel calls in the Caribbean were sustained and expanded by 2.5 per cent in 2020. Changes to container service schedules in the Caribbean have been less dramatic compared with other regions. Container vessel calls in 3 among the 15 countries that handle the largest number of annual container vessel calls in LAC, namely Chile (–15.2 per cent), Honduras (–15.1 per cent) and Mexico (–11.3 per cent) registered double-digit decline rates in 2020. Bahamas, the Dominican Republic, Jamaica, and Trinidad and Tobago saw their annual container vessel calls increase in 2020. In Panama, which accounts for approximately 15 per cent of LAC container vessel calls, calls in 2020 remained steady, despite high volatility during the year. The Panama Canal experienced a sharp decline of container vessel calls in Q2 2020 (–6.1 per cent), and an even sharper one in Q3 2020 (–13 per cent). Container vessel calls were also sustained in Costa Rica (0.52 per cent), Ecuador (–0.4 per cent) and Guatemala (0.5 per cent).

Bulk, breakbulk and Ro-Ro vessel calls

In 2020, vessel calls by breakbulk cargo carriers declined by –14.8 per cent compared with 2019, a much higher decline rate than the world average and the second major negative regional impact after Oceania. Among the 15 countries that host most breakbulk vessel calls in LAC, five experienced a decline exceeding –20 per cent. Brazil and Mexico, which handle about 22 per cent of the region’s breakbulk vessel calls, performed better than the rest. In Brazil, the calls fell by –7.1 per cent in 2020, while Mexico recorded an increase in port calls.

Calls of dry bulk carriers declined by –8.6 per cent. Brazil, which hosts one third of dry bulk vessel calls in LAC, recorded an annual decline of –5.9 per cent. A similar pattern was noticed in Argentina, which hosts one fifth of the dry bulk vessel calls in LAC. Colombia, which handles over 1,000 calls annually, recorded a significant drop in calls. Two of the 15 countries that handle the largest number of dry bulk vessel calls in LAC experience a decline exceeding –30 per cent (Ecuador, and Trinidad and Tobago). An additional three more countries experienced a decline above –20 per cent (Colombia, the Dominican Republic and Jamaica), while in Cuba, the fall stood at –14.6 per cent

In 2020, wet bulk vessel calls declined in LAC (-10 per cent). Brazil, which hosts a quarter of the wet bulk vessel calls in LAC, saw its vessel calls decline by a moderate -2.2 per cent. The impact was more significant (-11.1 per cent) in Mexico, the second largest wet bulk vessel calls market. Two countries saw their vessel calls dip by over 30 per cent in 2020. These were the Bolivarian Republic of Venezuela (-35.9 per cent) and Peru (-34.6 per cent). These were followed by Ecuador (-23.5 per cent).

The impact on the LNG and LPG vessel calls was less dramatic. Brazil, which hosts one-third of the vessels calling in the region saw a decline of -14.2 per cent. Decline rates were higher in Trinidad and Tobago (-25 per cent), Argentina (-20.4 per cent), Colombia (-19.3 per cent) and Ecuador (-15.4 per cent). Countries that saw an increased number of LNG and LPG vessel calls included Cuba and Puerto Rico.

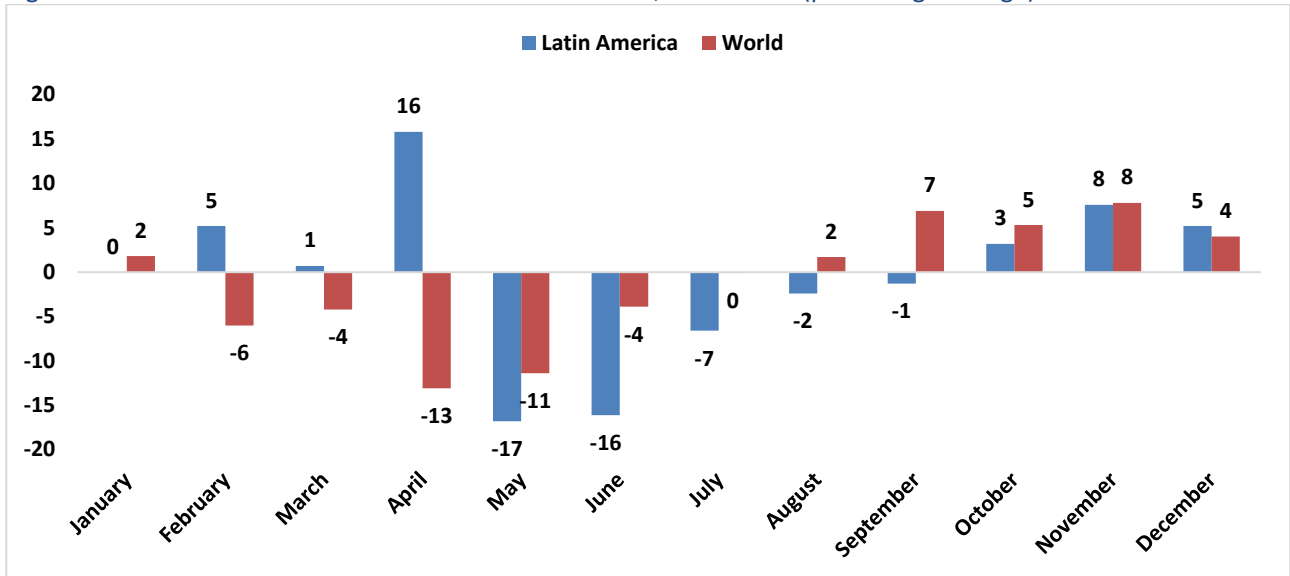
Ro-Ro vessel calls declined by -16.8 per cent in 2020. All three LAC subregions experienced large drops in vessel calls and high volatility. Ro-Ro vessel calls in South America were heavily affected (-22.4 per cent). Calls in Central America fell by -16.1 per cent and in the Caribbean by -11 per cent.

Container port traffic

In March 2020, container port traffic in Latin America was -0.7 per cent lower than March 2019. This was followed by sharp drops of -15.8 per cent in April 2020, -16.8 per cent in May and -16.1 per cent in June. In October 2020, there was a return to year-on-year growth. The throughput for the entire 2020 was a year-on-year fall of -2.9 per cent compared with 2019 (Container Trade Statistics, 2021).

Changes in trade composition accompanied the weakening of containerized trade. In Latin America, where the volume of containerized imports has historically been more significant than that of exports, the pandemic had a more substantial effect on the former, leading to some convergence of these two variables. Containerized exports from the region topped imports for most of the period from February to June 2020. From July onward, imports again exceeded exports by a considerable amount (Barleta and Sánchez, 2021). The pandemic further impacted exports and imports between LAC subregions between January and December 2020. Container volumes between Latin American countries during this period fell by -14.2 per cent over 2019 levels (figure 39).

Figure 39: Global and Latin American containerized trade, 2019–2020 (percentage change)



Source: UNCTAD, based on data from Container Trades Statistics (2021).

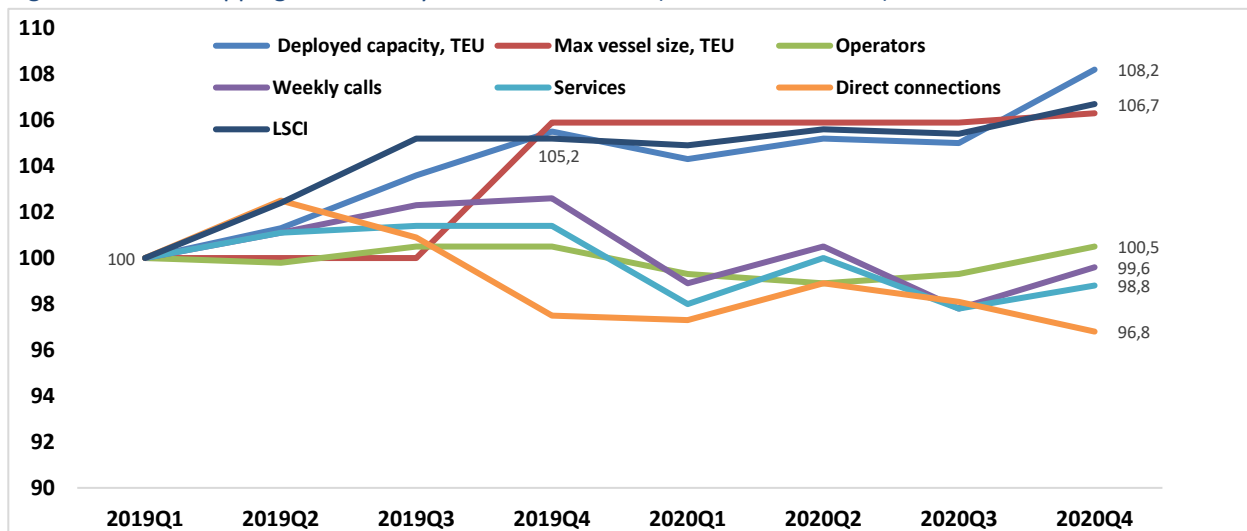
According to the Association of Caribbean States (Sabonge, 2020), a diversion away from luxury goods was followed by a diversion away from traditional source markets and an increase of a nationalistic approach to trade. The pandemic was an opportunity to promote intraregional trade. Developing regional value chains to support micro, small and medium-sized enterprises in order to strengthen production capabilities and develop new strategic sectors as drivers for job generation emerged as part of the agenda, at least in certain parts of LAC.

An initial review of the short-term impacts of the pandemic and new control procedures on the shipping and maritime operations indicates an average additional delay of 2.5 to 4 days in the arrival of import containers at their final destination. Similar delays were also detected in inland border-crossing and air cargo delivery, in addition to increased prices of some essential goods. According to port operators, the adverse effects observed were severe, and in some cases were aggravated by logistics bottlenecks. These could include, for instance, the lack of storage capacity at ports, the unavailability of empty containers, and the need for new institutional arrangements for crisis management (United Nations Economic Commission for Latin America and the Caribbean, 2020).

Liner shipping connectivity

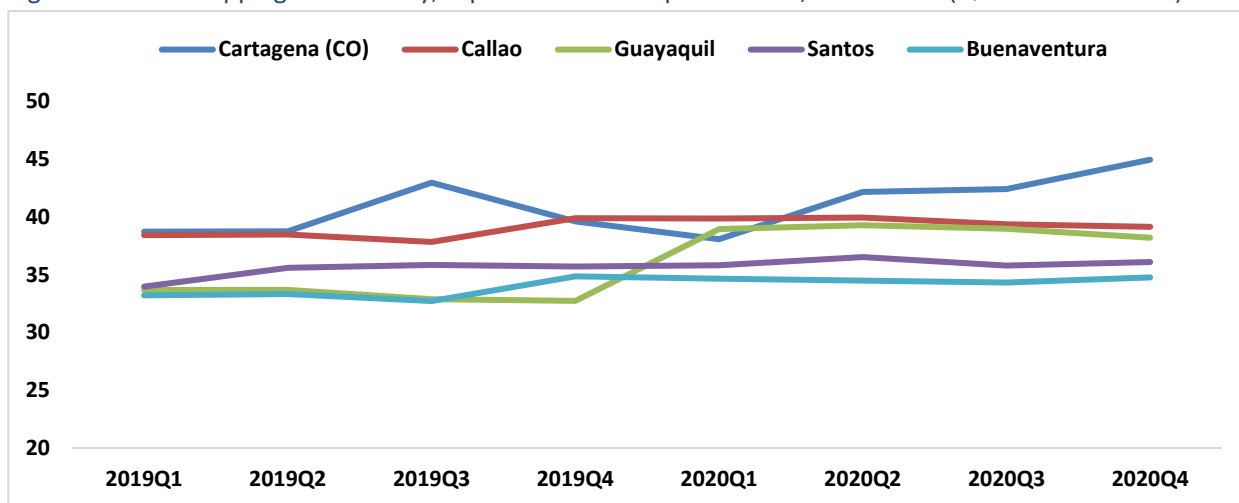
In 2020, the number of weekly calls, the number of direct connections, and the number of container services offered in LAC declined. The drop was offset by an increase in the overall deployed capacity of container-carrying vessels, reflecting increased vessel sizes. Consequently, the overall connectivity levels as captured by the LSCI increased by approximately 1 per cent (figure 40). Liner shipping connectivity data for LAC suggest that the pandemic had a moderate impact in Q1 and Q2 followed by a slight decrease in Q3 and recovery in Q4 2020. The LSCI of best-connected ports in the Caribbean, namely Kingston, Caucedo, and Freeport Bahamas increased in 2020. Connectivity levels during 2020 also increased in Central (i.e. Manzanillo, Colon, Rodman, Cristobal) and South America (Cartagena, Callao, Guayaquil, Buenaventura) (figure 41). One factor that may explain the relative resilience of LAC's shipping connectivity is its contribution to food exports, including during the pandemic. Another consideration is the shift in liner shipping connectivity parameters. Trends in the LSCI components highlight a change in the container deployment strategies during the year where upsizing of container vessels deployed was often enough to offset any negative impact resulting from blank sailings that may have occurred (for example, Port of Cartagena, Colombia) (Table 31).

Figure 40: Liner shipping connectivity in LAC, 2019–2020 (Q1 2019 LSCI = 100)



Source: UNCTAD calculations based on data collected and provided by MDS Transmodal (2021).

Figure 41: Liner shipping connectivity, top five connected ports in LAC, 2019–2020 (Q1 2019 LSCI = 100)



Source: UNCTAD calculations based on data collected and provided by MDS Transmodal (2021).

Table 31: Liner shipping connectivity components in LAC, 2019-2020 (2019 Q1=100)

Indicator	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Total number of services	100	102	104	100.3	96.7	98.6	99.8	98.8
Total number of Weekly Country Calls	100	101.1	102.3	102.6	98.9	100.5	97.8	99.6
Sum of Operators	100	100.5	100.2	100.7	97.9	100.5	99.3	100.5
Max ship capacity (TEU)	100	102.9	108.4	109.5	110.2	110	110.5	112.6
Total Deployed Capacity	100	101.3	103.6	105.5	104.3	105.1	105.0	108.2
Total number of direct calls	100	102.5	100.9	97.5	97.2	98.9	98.1	96.8
Liner Shipping Connectivity Index (LSCI)	100	102.3	105.2	105.2	104.9	105.6	105.4	106.7

Source: UNCTAD calculations, based on AIS data collected and provided by MDS Transmodal, 2021.

Response and mitigation measures

Business and operational continuity

The priority was to create conditions for guaranteeing the safety and welfare of employees and users while maintaining ports open to continue giving critical services to support the supply chains. The immediate implementation of protocols designed for all sectors of the economy, and the design of communication plans were among the key adaptations. In particular, ports implemented new protocols for those required to be physically present while continuing to work. At the same time, they implemented remote working practices, increased frequency and depth of learning in all key areas, and introduced measures for vessel and terminal access, online gate process options and new gate hours. Splitting working teams (dockworkers gangs) to create redundancies in case of positive COVID-19 collaborators and assure operational continuity was also crucial for maintaining operations. Set out in the following sections are some examples of measures implemented in the LAC region.

In a survey conducted by the Central American Commission on Maritime Transport, almost 100 per cent of the ports and terminals surveyed indicated that, due to measures introduced they had not suspended operations at any time, despite the situation caused by COVID-19. Only one port restricted the hours of operations and services to ships by two hours a day, one in the morning and another in the evening, using this time for staff shift changes, as these changes involved the execution of prevention measures against COVID-19. These measures did not prevent, in some cases, the reduction in the hours of services to cargo by 10–12 hours (Dominican Republic and Guatemala) (Central American Commission on Maritime Transport, 2020a). The same survey reveals that, despite the implemented measures by the national authorities, ports, and terminals, the resilience of maritime supply chains continued to be tested in specific countries (for example, Nicaragua). Ensuring consistent compliance with the newly imposed standards was difficult, either due to organizational capacities or knowledge, and this challenged the offering of the essential services that were necessary to avoid food shortages.

In March 2020, the Government of Panama declared a full quarantine and lockdown in the country. The Panama Canal Authority identified 3,700 employees as a necessary minimum to maintain safe and continuous operations along the waterway and efficient services for clients. Physical distancing was enforced to protect the well-being of employees, and technology played a crucial role in enabling critical administrative personnel to telecommute. Systems were adapted for remote access in a secure and stable manner. One positive aspect for the Panama Canal was that protocols were already in place to handle infectious diseases, such as the Regulation on Sanitation and Prevention of Communicable Diseases, last updated in 2016. This regulation noted several illnesses that required a period of quarantine and procedures to handle crews, passengers and vessels under such conditions. The regulation was the basis of the initial approach of the Panama Canal Authority to dealing with the pandemic since it established the procedures to follow before the arrival of a vessel and general requirements upon its arrival, as well as protocols for inspections and health measures that included procedures designed for infectious diseases. Officers from the Panama Maritime Authority's directorate of ports started visiting the terminals to verify that the health measures recommended by the Ministry of Health were being complied with to guarantee port workers' care (Panama Maritime Authority, 2020). At Balboa, PSA International Terminal on the Pacific side and Manzanillo International Terminal, Colon Container Terminal, Terminal Bahía Las Minas Vopak and Cristóbal on the Atlantic side, operations continued under entirely new safety and social conditions (Labrut, 2020).

All ports and terminals in Chile (Valparaíso, Puerto San Antonio, Puerto Central and Puerto Panul) adopted and complied with protocols that established guidelines for timely detection of those ashore or on board who might have generated local transmission of COVID-19. These were among the terminals that implemented improvements in their processes and reinforced prevention measures for their workers. Operations were adapted. Seeking operational continuity safely included protocols and contingency plans being set up, with related prevention and control actions. Working hours were revisited to reduce

crowding and use of shared facilities and transportation. Screening processes were applied to access the port, with these processes supported by an epidemic questionnaire and temperature check, prevention guidelines, and monitoring and integrated reporting of COVID-19 cases that included interaction with local and national sanitary agencies. Some ports incorporated technology for the early detection of coronavirus cases, using devices placed in the primary access and cargo logistics centre. One such case was Port Coronel, the third largest port in Chile (Labrut, 2020).

Puerto Ventanas identified those most vulnerable to contracting the virus. These employees were allowed 15 days leave with pay. Remote work was allowed for the company's administrative areas; alcohol gel dispensers were installed in different strategic points of the port, and the procedure of taking the temperature of everyone who entered the port was implemented.

In the Dominican Republic, facilitation of safe conduct for port workers, cargo stevedores, and related workers was prioritized (Central American Commission on Maritime Transport, 2020a). The results of a second survey of 32 ports in Central America indicated that the application of preventive measures were aligned with the WHO sanitary recommendations – the three most effective sanitary measures for prevention during the pandemic according to the respondents were the use of a mask, hand washing and physical distancing (Central American Commission on Maritime Transport, 2020b).

Ports in several countries (for example, Argentina) established new crew controls for foreign-flagged vessels' crews. All vessels had to present mandatory and complementary documents 72 hours before arrival. The ships coming from any of the affected areas within the preceding 14 days were obliged with no exception to send copies of the medical records of crew and passengers on board, including body temperatures, daily to the health authority. In the cases of any suspicious actual or potential case of disease that might endanger the country's population's health, the vessel was quarantined.²⁹ Carriers that had to make huge adaptations in short periods of time (i.e. service and frequency changes, vessel sharing agreements, slot agreements) prioritized business continuity. Their strategy was defined by the expectation that they and the regional container carriers would be able to continue operations.

The role of communication plans and practices was vital. For example, Puerto Ventanas in Chile took several measures to protect all its workers and their families and prevent the virus from spreading, further providing an example of the importance of communication plans. According to the port authority, working together with unions to reinforce these measures and maintain effective and constant communication with personnel was crucial. Its Institute of Work Safety held two information sessions for employees, workers from Aconcagua Maritime Agency and contractor companies, and the Puchuncaví community to inform them about preventive measures at the personal and work level (Puerto Ventanas, 2020). In a similar way, the Port Authority of Jamaica, which introduced additional safety measures and systems to ensure the protection of employees, stakeholders and users of the seaports in general, also emphasized the importance of communicating with its stakeholders and the public on initiatives being introduced for their protection and to enhance safety systems at Jamaica's seaports (Port Authority of Jamaica, 2020). Whenever communication plans were not ready, port authorities and terminal operators worked to immediately create a plan on how to communicate the new conditions to the port users.

Public administrations made every effort to maintain the functioning of ports. For example, the Ministry of Foreign Trade and Tourism of Peru indicated that during the state of emergency it was going to continue to provide cargo and merchandise transport services both nationally and internationally and that all ports would operate normally, allowing supplies amid the crisis caused by the spread of the coronavirus. The services included land, water and rail transportation modes, as well as all related activities, such as services provided by maritime agencies, warehouses, logistics operators, cargo inspectors, and other actors in the logistics chain. The purpose of maintaining these services and activities was to comply with the commitment to the country, to keep its population supplied with both products and energy, to avoid price

²⁹ Source: Inchcape platform on COVID-19 crew and port implications, <https://www.iss-shipping.com/coronavirus-port-country-implications>.

speculation in the markets and to ensure continuity of the productive sector (Autoridad Portuaria Nacional (Peru), 2020).

Some LAC countries decided not to implement strict measures in response to the pandemic outbreak. Yet even in these cases, port authorities opted to revisit the existing procedures in the light of the emerging crisis. In Brazil, for example, sea, road and rail accesses remained open without any restrictions. Ports operated based on criteria established by the health authorities to protect all personnel, whether port crew, employees of private companies, truck drivers or other workers. The port authority at Acu Port, for example, established measures to protect collective well-being and organizational performance during the pandemic, with the basic premises being to protect employees' health and safety and to guarantee all jobs. These measures included (a) the adoption of a remote work policy with financial support and more flexible benefits, reducing the number of employees in all activities and operational fronts, and halting work at administrative offices; (b) the suspension of trips, visits and events; (c) a programme encompassing actions to support employees during the pandemic through physical and mental health initiatives, as well as professional and personal balance programmes; (d) the implementation of online platforms for medical and psychological appointments; (e) financial recognition for frontline workers (bonuses); (f) implementation of healthcare and hygiene protocols, with technical support from institutes that were benchmarks in healthcare in Brazil. These efforts were backed by constant communication and dialogue at all levels of the organization, keeping employees up to date on news about the pandemic and reinforcing preventive measures (Port of Açú, 2020).

Another example is Brazil's Santos Port Authority, which implemented measures such as, inter alia, the creation of a multidisciplinary 24/7 group to concentrate on actions combatting COVID-19; the consolidation and actualization of the port's contingency plan; consideration of the epidemiological emergency acquisition of surrogate products (liquid alcohol and hygienic tissues) for use in the case of alcohol gel shortage; endorsement of sanitary measures; definition of a specific quay area for mooring of ships with suspicion of COVID-19 infection; and allowing employees, whenever possible or when belonging to a high risk group, to telework.

Once vaccination programmes began, the prioritization of dockworkers in the national programmes was essential. Workers at seaports and other maritime sectors called for the vaccination of workers in these sectors and their recognition as essential workers. For example, in May 2021, activity at Argentina ports was brought to a halt due to strikes that started with the dockworkers and spread to more unions and other sectors of marine operations (*The Maritime Executive*, 2021c). Unlike most strikes that focus on wages and working conditions, the workers in this case went on strike demanding COVID-19 vaccinations. Shipping was temporarily disrupted. All these were at a critical time for Argentina's agricultural industry, which was at the peak exporting season for its annual soybean and corn exports. The decision to strike was taken following meetings with government entities, ministries, ministers and other national and provincial institutions, without receiving satisfactory responses. The unions demanded the development of a strategy, and a commitment to a vaccination schedule and development of a clear protocol.

Financial support

Financial sustainability along the supply chain was of equal importance. Argentina is an example where ports in the country made changes to help users during the pandemic. The port of Buenos Aires offered an extended period of free storage in port terminals despite the scarcity of space (Puerto Buenos Aires, 2020). The aim was to support shippers and continue transporting their cargoes.

The Panama Canal announced a temporary adjustment to its reservation system that would provide customers with added flexibility. The waterway implemented for 120 days temporary changes to the requirements for the placement of booking guarantees and advance payment of reservation fees when the reservation was confirmed. Customers were allowed to place the contract to pay the booking slot before the vessel initiated its transit. The aim was to help reduce the financial burden on customers. The Brazilian Port of Acu implemented restrictions of non-priority expenses, zero layoffs or contract breaches,

and provision of funds to implement measures to protect employees' health and maintain jobs. The measures were accompanied by the facilitation of suppliers via early payments to smaller suppliers, but also actions fulfilling the port's social commitment of being involved with the community to strengthen humanitarian actions.

Hinterland connections

Sustaining hinterland transportation links was the major challenge in LAC maritime supply chains. Compared with global trends, LAC ports have been affected by hinterland delays, dockworker shortages, and truck driver availability more than any other region.

According to the IAPH–World Ports Sustainability Program (WPSP) Port Economic Impact Barometer survey (Notteboom and Pallis, 2021), at least 30 per cent of the ports in the region reported an increase in delays on trucks crossing borders. Ports that remained open reduced workforce numbers, a move that exacerbated the cargo congestion, even when the cargo volumes were lower than in the past. Last-mile vulnerabilities in distribution became more visible because of the lower availability of workforce in interlinked activities, such as lack of truck drivers and limitations in the provision of truck services due to COVID-19 related restrictions. Thus, the initial phase of the pandemic immediately exposed the potential fragility of the global supply chains and brought into focus possible severe shortages of critical medical components needed in the fight against the pandemic.

Inland transport issues, in addition to port restrictions in transit countries, had drastically reduced the connectivity, efficiency and timeliness of trade during the first year of COVID-19 (Notteboom and Pallis, 2021). For example, Latin American exports, mostly commodities, to China were impacted. The region had been favoured by trade tensions between the United States and China, but following the start of the pandemic this trade was hindered. For example, the arrival and logistics of trucks transporting grains to and from the port terminals in Arroyo Seco and Timbúes, both located in Argentina, were affected. The number of trucks decreased by –5.1 per cent per week (United Nations Economic Commission for Latin America and the Caribbean, 2020).

The absence of consistent international collaboration limited the responses that would have increased the resilience of the supply chains. Countries such as the Plurinational State of Bolivia and Paraguay that rely on the maritime connectivity of ports in neighbouring countries faced closed international borders in addition to the regular challenges of time, cost and distance to reach goods across international borders. Efforts were made to address the several negative side effects on the transport and trade flows and the economic and social well-being of cities and towns at border limits. In Paraguay, for example, the Ministry of Industry and Commerce sort to attend to these localized socioeconomic effects by extending social benefits to border citizens. The objective was to recover as many jobs as possible, promote e-commerce and provide financial aid in the form of tax assistance, extend the country's social programme for the protection and assistance to families in situations of poverty and vulnerability, and help local businesses (*Revista Logística del Paraguay S.R.L.*, 2020).

In this context, several initiatives focused on avoiding yard capacity overutilization that would eventually undermine efficient operations. Beyond securing the free movement of port workers to and from ports, in Costa Rica and Guatemala the emphasis of ports was on the monitoring of road transportation and the identification, in partnership with other public authorities, of ways to ensure the fluidity of cargo towards inland destinations. The scope was to enable companies to remove their import containers, even if these companies were not allowed to produce due to the pandemic. In Panama, the emphasis was on enabling the operation of companies offering support logistics that were critical for port operations, including those carrying out maintenance, repairs and value-added services, as well as ensuring the conditions that would allow local cargo to be processed outside ports to avoid increasing container utilization.

In all these cases, exploring ways to lower vehicle restrictions to avoid further load release delays, and thus reduce the saturation of container port and terminal capacity, led ports to the conclusion that it was necessary to improve digital platforms for permits and licences and improve coordination between stakeholders and responsible public authorities (Central American Commission on Maritime Transport, 2020a).

Measures aimed at containing the pandemic negatively affected custom operations. An example is the reduced hours of Bolivian customs operations. Slower customs controls and procedures have impeded port hinterland operations. According to the Bolivian International and National Transport Association and the Bolivian Chamber of Transport, border crossings from maritime nations to landlocked countries such as the Plurinational State of Bolivia were slow, with trucks queuing due to slowness in customs clearing processes (*La Razon News*, 2020). Similar challenges were observed in Paraguay (*Revista Logística del Paraguay S.R.L.*, 2020).

Digitalization

Ecuador, as an example, found it necessary to accelerate the use of digitalization in its processes. It avoided port congestion during the crisis through, among other measures, online billing of all import and export services through websites. At Guayaquil Port Terminal, carriers were allowed to register the vehicle and enter to remove the load by using an application. The digital system allowed information to be entered electronically to remove imported cargo and obtain information on exported cargo without the need for printed documents. Additionally, clients could invoice and obtain shifts for the withdrawal or delivery of empty containers. Shipping companies were able to register reservation numbers, and to know the temperatures of refrigerated containers. The enrolment of the carriers was received and confirmed via email, and the validations were also through the electronic system. The digital AIS system was thus used for imported and exported cargo.

The pandemic also accelerated the digitalization of all maritime and logistics companies. An interesting case is the Panama Ship Registry, which continued operating without interruption and with 100 per cent teleworking of staff; in this way it supported the 53 consular offices and 13 international technical offices worldwide and provided 24/7 services. In April 2020, the Registry introduced the electronic ship registry and electronic radio licences, with these documents validated through QRs and barcodes. The use of these innovative techniques included an eco-friendly paperless initiative; documents self-protected from unauthorized editions; a unique sequential number assigned and controlled by the Merchant Marine Directorate of the Panama Maritime Authority; and a QR code that directed to an application that displayed document information in real-time, proving its authenticity. Therefore, any authority or any third party could confirm the validity of the scanned documents through a simple QR reader available via an online application store at any time. These developments went hand in hand with a registry modernization plan, the first stage for complete digitalization. The Panamanian consulates had previously issued the provisional ship registry and the radio licence in hard copy. With these new techniques, the use of digital signatures were introduced. It was also recognized that digitalization required a transition period, i.e. a dual system of both paper and electronic options to ensure that all ship owners and vessels received the documents they needed in real-time until all registered vessels had migrated to electronic records.

Additional actions concerning COVID-19 were developed to secure a digitized process in Panama and elsewhere. Vessels requested support, for which authorizations, employment agreements for seafarers, and the like, had to be granted; following the outbreak of the pandemic, certificate issuance and validation processes became digital. These actions enabled by digital solutions provided shipowners with the valid documents needed during times of crisis so their operations could continue.

Customs

Countries in the LAC region revised early measures restricting the movement of people, intensified epidemiological surveillance at border-crossing points, and took customs measures to stimulate the free flow of essential goods. Some countries strived to apply customs rules aiming to facilitate the international trade of medical supplies, both to incentivize imports and to disincentivize exports. In Paraguay, for example, on the one hand, there was a temporary reduction – and in some cases temporary total suspension – of VAT on certain imported personal protective equipment and pharmaceutical products. On the other hand, licences were required to export facemasks and ethyl alcohol.

Communication

In Brazil, for example, the Port of Acu relied on continual efforts in communication to keep the local community informed and aware of protection measures. This was a multilayer programme including reinforced communication with the community in partnership with public authorities, through specific channels such as loudspeakers on motorcycles, radio advertisements, among others. Communication with clients and partners about actions implemented against COVID-19 were reinforced and a customer service centre was customized to address questions. A continuous awareness-raising campaign was deployed, while new media, such as social media and websites, were updated with specific pages to report on the health and safety measures that were implemented (Port of Acu, 2020).

Cooperation and partnerships

Several LAC ports created forums and joined intersectoral discussion committees. At the international level, LAC ports participated in the COVID-19 task force of IAPH. The task force was created to analyse and manage the pandemic's impacts on the global port sector. Via this initiative, LAC ports collaborated with the international port sector by surveying and continuously monitoring the effects of the pandemic worldwide and sharing the industry's experiences in actions to address the health crisis. At the national level, both public and private organizations shared and disseminated information and protocols, enhancing overall knowledge on how to address COVID. In the Brazilian example, such organizations included the Ministry of Infrastructure and the National Waterway Transportation Agency in the public sector, and the Association of Private Terminals in the private sector. The former spread good practices against COVID-19 throughout the Brazilian port system. The latter set up a benchmark among domestic private terminals and created a dashboard with all initiatives adopted by terminals in the fight against the pandemic.

PART III:

SUMMARY AND LESSONS LEARNED ACROSS REGIONS

The crisis that the global economy experienced due to COVID-19 in 2020 disrupted maritime supply chains all over the world. Vessel call trends were volatile across shipping markets, with an overall downward pressure being apparent. Global maritime trade contracted, reflecting negative trends across regions and country groupings. However, with a rapid upswing in demand by late 2020, all shipping freight markets saw a progressive recovery in the second half of 2020 except for oil trade. A key issue was the capacity of most countries to respond effectively to the challenges created by the pandemic during its first year.

In terms of vessel calls and on a yearly basis, container shipping and LNG and LPG carriers seem to have been affected the least. Port calls by dry breakbulk carriers and Ro-Ro vessels were the hardest hit. Vessel call patterns varied by region, reflecting the asynchronous trajectory of the pandemic through time and geography. LAC and Europe experienced a significant drop in total vessel calls, followed by Oceania. Asia fared relatively better than other regions, reflecting the resilience of the container shipping segment. Impact on the vessel calls of developed economies was greater than on calls in any other type of economy.

A restructuring of container services took place during 2020. Key developments included blank sailings, different terms of services to shippers, delays of vessels at ports, difficulties to move cargo to and from the port and hinterland space, higher freight rates, and not least, bigger vessels being deployed and less services resulting in larger loads and reduced number of vessel calls. Delays caused capacity shortages and, ultimately, contributed to a freight rate surge. Overall, trade became more expensive with clear inflationary pressures at play while carriers became better at capacity management (via blank sailings and vessel-sharing agreements accompanying alliances) and enjoyed greater profitability. Carriers also enjoyed higher prices in the second-hand market and charter rates.

However, the whole maritime chain was destabilized. A spiral of reactions – the absence of demand following the initial shock; lockdowns; standstill of economic transactions and production; revisited working practices; difficulties for consignees to collect cargo; shifts in ship capacity management by carriers; volatile utilization of warehousing and distribution facilities; and lack of containers to be filled in several production areas – all led to significant backlogs in container trade. The implications were present at both the first-mile and last-mile stages of the chain. Thus, local interruptions had a broader impact along the entire maritime supply chain worldwide.

Meanwhile, the picture revealed by the UNCTAD LSCI was mixed. On the one hand, fewer vessel calls at ports were associated with the continuous increase of vessels size. By the end of 2020, connectivity of the world's major hubs and most connected nations had improved. On the other hand, there was no sign of improvement in the liner shipping connectivity of the least-connected countries. SIDS were particularly affected by reduced vessel calls. For SIDS, missing one call might be vital for their economies and local communities as they depend heavily on maritime transport for much of their imports, including the provision of essential goods. Therefore, it is crucial that the liner shipping connectivity of SIDS, which is already relatively low, should not be further reduced.

Importantly, in 2020 maritime supply chains continued to be subject to a number of non-pandemic deficiencies that predated the pandemic. Non-pandemic-related limitations that continued to have an adverse impact on the resilience of maritime supply chains, including security issues or cybersecurity, inadequate infrastructure, capacity issues, congestion, and hinterland transportation limitations, were also exacerbated by the COVID-19 crisis.

To cope with the disruption and to continue to link supply chains and enable smooth cargo flows, key stakeholders in the maritime supply chain, of which ports and shipping are key players, adopted a range of response and risk mitigation measures. The box below summarizes the experience and the views of various stakeholders in the maritime supply chain, including challenges faced and responses implemented.

Box 1: Experiences shared by stakeholders in the maritime supply chain

The UNCTAD global survey on “[COVID-19 and maritime supply chain: Resilience-building and preparedness](#)” was disseminated between May and July 2021. A total of 48 valid responses were received from Asia, Africa and LAC. Respondents spanned the maritime supply chain and included port authorities, port management companies, port and terminal operators, shipping and inland transport service providers, shippers and cargo interests, freight forwarders, government and academia.

Almost all respondents (95 per cent) have been affected by the COVID-19 pandemic. They reported having faced operational (ports, shipping, and hinterland) and financial impacts, delays, labour and crew change issues, and problems concerning cargo handling equipment, distribution centres, and warehousing. Over half observed an increased use of technology. A majority suffered a loss in traffic, less than half experienced organizational change, over one-third reported loss of business while over a quarter saw a reduction in competitiveness and market share. More than one-quarter reported having experienced layoffs. Low productivity, loss of revenue, and the difficulty associated with a realignment of funds for COVID-19 response, as well as the postponement of some infrastructure projects (e.g. warehouse construction), were also mentioned. For many respondents, the five years that preceded COVID-19 had already been challenging given events such as natural disasters (in particular typhoons and hurricanes), labour strikes, political tensions, exchange rate variations, as well as the evolving policy and regulatory landscape (e.g. private sector participation, efficiency requirements, and sustainability goals).

Almost all respondents reported having implemented various operational changes and adjustments, including new working hours and arrangements. A significant majority implemented financial or economic adjustment measures, while others activated contingency plans and adopted technology and digital tools such as electronic payment methods, mobile money for the payment of services and electronic release of cargo. For many respondents, stakeholder relations had to be adjusted together with communication plans and strategies. Prioritizing essential goods was implemented by a large majority. It was noted that coordinating integrated actions among the port community actors was important. This was enabled by true collaboration and clear up-to-date communications, reliable Internet connection, web-based application systems, real-time data sharing and technological know-how, and close communication with public authorities. Together, all these measures were deemed effective in helping navigate the crisis.

Respondents indicated that certain areas were particularly challenging when responding to the disruption. These included: (i) nautical services; (ii) ship/port interface; (iii) yard and storage facilities; (iv) customs; (v) inland transport and hinterland connections; (vi) distribution; (vii) tracing of merchandise and people; (viii) border crossings; (ix) interactions with stakeholders both internal and external and interaction with public authorities; (x) administration services; (xi) implementation of new public policies and decisions; (xii) labour and equipment shortages; (xiii) blank sailing; (xiv) crew change; and (xv) prioritization of essential goods. A majority felt, however, that the pandemic had also generated positive impacts and opportunities. These included organizational cost savings resulting from teleworking, enhanced collaboration among port users leading to a more integrated environment, increased awareness of the importance of ports and shipping, improved IT systems, and accelerated digitalization. Some said to have experienced an increase in trans-shipment volumes and container traffic.

Looking ahead, nearly two-thirds expected their organization to invest in risk assessment and management, forecasting, early warning systems, emergency plans, and business continuity for better preparedness. In their view, the pandemic had changed the mindset. For many, investing in risk and crisis management was already a prevailing practice. More than half expected their organization to change investment plans to integrate considerations relating to resilience-building and future-proofing operations and business. Less than half indicated that their organization had already mainstreamed considerations and criteria relating to disruptions, including pandemic-related disruptions, into planning, investment and policy decisions. Less than one-third were planning to do so.

A significant majority of respondents felt that capacity-building and technical assistance were needed to help build and strengthen resilience and future-proof the maritime supply chain (e.g. risk assessment, forecasting and management; business continuity planning; emergency and communication planning; good practices in disruption management; technology and digital tools uptake; investment strategies; infrastructure development and maintenance; skills and expert knowledge in resilience management; and recovery planning for continuity. The formulation of standard operating protocols for handling crew change was deemed necessary.

Key takeaways and lessons include the following:

- **International recommendations and directives** issued by relevant institutions at the global level, including in connection with health measures (WHO), customs (the World Customs Organization) and trade (the World Trade Organization), were **instrumental in informing and guiding** the response measures of both public and private actors.
- **Operational continuity measures** implemented amid the pandemic in 2020 enabled most ports and terminals to **maintain their operations**. Business continuity was made possible by changing working practices, adjusting operations, and improving communications relating to relevant changes to all stakeholders. Equally, ensuring the financial sustainability of the maritime supply chains was a critical crisis-management and resilience-building lever.
- Ensuring consistent application of newly imposed **standards** was sometimes challenging due to **organizational capacity and knowledge constraints**. Knowledge sharing, training and educational projects and initiatives helped overcome such limitations.
- Initiatives to **support workers and personnel** were helpful, if not essential. They included prioritizing safe conduct for port workers, cargo stevedores, and related workers, supporting physical and mental health, and financial recognition for frontline workers.
- Facilitating the **flow of essential goods**, such as pharmaceuticals, through 24/7 services and priority lanes was the first endorsed practice. Public authorities supported these initiatives, providing the enabling conditions for implementation.
- Once vaccination had started, maritime stakeholders (shipping companies and seafarers, ports and service providers) underscored the need to be declared **“essential workers”** and prioritized in vaccination. Several countries endorsed this approach.
- Adopting an **“inclusive approach”** that translated into support for users, providers and other stakeholders was important. Keeping maritime supply chains functioning and maintaining trade meant taking into account marine pilots, cutter crews, crane and plant operators, vessel traffic service operators, tug operators, quayside operators, stevedores, and the like. For operations to continue, it was essential to secure workers throughout the entire supply chain, not only port workers, drivers, and seafarers. Measures concerned the need to include not only the safety and welfare of users, but other positive measures, including easing the financial burden on suppliers, users and local communities.
- **Cooperation** between service providers and suppliers for **coordinating**, adjusting practices, and identifying alternatives was essential, especially when schedules needed to be adjusted and cargoes rerouted to alternate ports. Similarly, helping the consignees and manufacturers mitigate the impact of the pandemic and related restrictions was important; for example, by suspending penalties and ground rent charges on containers caught up in the lockdown.
- Response and mitigation measures required **effective communications** with all those involved to ensure their effective implementation. Constant internal communication and dialogue was essential for keeping employees updated on the pandemic's news and reinforcing preventive measures. Communication plans and practices were necessary to inform users, partners and stakeholders about actions implemented and adjustments to their operations. Communication with the community in partnership with public authorities generated essential awareness and effective responses.
- Having **protocols and contingency plans** setting out prevention and control actions that were ready to be deployed in the emergency was a game changer. They enabled quick and effective responses. Governance of crisis and emergency response strategies are worth developing via intensified collaboration and coordination of public and private actors. They need to be

communicated on time, avoiding last minute preparation and the risks of gaps and mistakes in implementation. Ports that had prepared and developed contingency and emergency plans were better able to handle the pandemic. On the other hand, whenever such plans were not ready, port authorities and terminal operators worked to immediately create a plan to communicate the new conditions to the port users. Furthermore, access to transparent and accurate information was essential in the fight against the pandemic. New media, such as social media and websites, were an important part of campaigns launched to reach broader communities.

- **Technology** played a crucial role in enabling critical administrative **personnel to telecommute**. Systems were adapted for remote access securely and stably. Some ports incorporated technology in the early detection of coronavirus cases, using devices placed in the primary access and cargo logistics centre.
- **Digitalization of processes** and the use of technology by much of the workforce triggered the need to revisit operations and upgrade knowledge and skills. **Digitalization of interactions** and information sharing were critical to the continuity of maritime transport operations during the 2020 phase of the pandemic. During the period, the pandemic brought to the fore the benefits of digital platforms for documentation, permits, operations, and the like. It also highlighted the importance of improving coordination between stakeholders and responsible public authorities. All seem to agree that digitalization is now a key component of resilience-building efforts.
- Sustaining **hinterland transportation** was a significant challenge in 2020. Closed international borders contributed to this challenge, i.e. slowness in customs clearing processes created huge inconveniences to reach deadlines with shipping companies. In this context the importance of trade facilitation measures cannot be overstated. Addressing the system-wide issues requires the setting of regional standards and mechanisms to ensure all industry players adopt them. It also requires the development of a joint approach in dealing with pandemics in neighbouring countries, i.e. through harmonization of testing processes and procedures as well joint certificate recognition and validation among partner states. The enhancement of **partnerships and cooperation** to achieve common international approaches that would facilitate a regional response to the pandemic would enable a level playing field for all stakeholders. Increasing **interconnectedness** of the different **modes of transport**, both the railway and roads, is important.
- **Public administrations** had a significant role in many respects. Beyond deciding measures and sanitary protocols, they played a crucial role in prioritizing workers at ports and other maritime industries in national programmes such as vaccination. **Collaboration and consultation between the industry and the public authorities** before endorsement were helpful. When such collaboration did not exist, the industry started endorsing measures ad hoc, a process resulting in practices that led to diverging outcomes.
- While initiatives rely mostly on governmental initiatives and/or other public agents, **industry actors can play a vital role**. Among others, they can be helpful by detailing their needs and contributing to the identification of ways to reverse any adverse conditions. Shippers and actors involved along the supply chains advocated the need for specific measures to combat the negative effects of the pandemic, but they also increased the sustainability of the entire system.³⁰
- On many fronts, the lack of **organizational and knowledge capacities** undermined addressing challenges and applying measures. **International and national collaboration** between stakeholders can help fill the gap and provide the opportunity to share experiences, disseminate information and protocols, and enhance the overall understanding of how to address a crisis such as COVID-19.

³⁰ Detailed by G. Langat, CEO of the Shippers Council of Eastern Africa in his presentation at the UNCTAD Webinar “COVID-19 and Maritime Transport: Disruption and Resilience in Africa”, 15 April 2021.

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