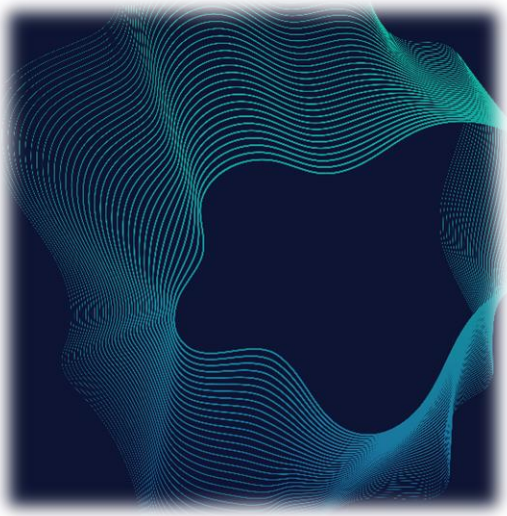
TRANSPORTATION FOR DEVELOPMENT IN OIC MEMBER COUNTRIES

IMPLICATIONS FOR TRADE AND TOURISM & CHALLENGES FOR LANDLOCKED COUNTRIES



TRANSPORTATION FOR DEVELOPMENT IN OIC MEMBER COUNTRIES

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CHALLENGES FOR LANDLOCKED COUNTRIES



ORGANISATION OF ISLAMIC COOPERATION

STATISTICAL, ECONOMIC AND SOCIAL RESEARCH
AND TRAINING CENTRE FOR ISLAMIC COUNTRIES

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ACRONYMS

ASEAN	Association of Southeast Asian Nations
CIF	Cost, Insurance, and Freight
CCFI	China Containerized Freight Index
COVID-19	Coronavirus Disease of 2019
COMCEC	Standing Committee for Economic and Commercial Cooperation of the OIC
ESCAP	Economic and Social Commission for Asia and the Pacific
FTK	Freight Tonne-Kilometre
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNI	Gross National Income
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICT	Information and Communication Technology
GNI	Gross National Income
LDC	Least Developed Country
LLDC	Landlocked Developing Country
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
OECD	Organisation for Economic Cooperation and Development
OIC	Organisation of Islamic Cooperation
OSBP	One-Stop Border Post
P-PP	Public-Private Partnership
SCFI	Shanghai Containerized Freight Index
SDG	Sustainable Development Goal
SESRIC	Statistical, Economic and Social Research and Training Centre for Islamic Countries
TEU	20-foot Equivalent Units
TTDI	Travel & Tourism Development Index
UAE	United Arab Emirates
UN	United Nations

UN-OHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States
UNCTAD	United Nations Conference on Trade and Development
UNWTO	World Tourism Organization
US	United States of America
USD	United States Dollar
WHO	World Health Organization

FOREWORD

Transportation plays a crucial role in the economic development of nations, reflecting their level of progress and acting as a catalyst for economic and human development. It is no surprise then that transportation has found its way into the OIC -2025 Programme of Actions as one of the goals and into the 2030 Sustainable Development Agenda, where some SDGs are directly or indirectly connected to sustainable transport through specific targets and indicators. In this light, it gives me great pleasure to present to you this report *"Transportation for Development in OIC Member Countries: Implications for Trade and Tourism & Challenges for Landlocked Countries"* which provides deep insights into the state of transportation networks in OIC member countries, highlighting their impact on economic growth, trade, tourism, and the unique challenges faced by landlocked OIC countries.

The OIC countries collectively account for one sixth of the world's land area and enjoy a vast strategic region. They are well-endowed with potential economic resources in different fields and sectors. However, as this report points out, the state of transportation networks within these countries presents significant challenges. Current statistics reveal that road infrastructure remains inadequate, with limited road connectivity hampering the efficient movement of goods and people, impacting trade and economic integration. In addition, the air, rail, and maritime sectors also face considerable obstacles in terms of connectivity, capacity, and infrastructure development. These challenges highlight the urgent need for investment, improved intermodal connectivity, and efficient transport policies to unlock economic potential, enhance trade flows, and foster regional cooperation.

Furthermore, the report explores the profound impact of transport connectivity on trade, emphasizing the critical role that improved transport infrastructure plays in expanding trade flows, fostering growth, and generating prosperity. The report also delves into the interplay between transportation and tourism, recognizing the potential for the development of a sustainable international tourism sector within OIC countries.

The report gives special attention to the specific challenges faced by landlocked countries within the OIC. These countries, lacking direct access to open seas, encounter unique trade and development obstacles. The report examines the challenges arising from long distances to seaports, dependency on transit countries, high transport costs, and limited regional integration. The report emphasizes the importance of regional transportation networks and ongoing initiatives in improving connectivity for landlocked OIC countries.

In conclusion, the report “Transportation for Development in OIC Member Countries: Implications for Trade and Tourism & Challenges for Landlocked Countries” aims to provide a deep understanding of the current state of transportation in OIC member countries and the challenges they face. It offers a series of policy recommendations to address these challenges and promote sustainable transportation systems. It is our hope that this report will serve as a valuable resource for the OIC member countries, facilitating informed decision-making and fostering cooperation to enhance transportation for development.

Zehra Zümrüt SELÇUK
Director General
SESRIC

EXECUTIVE SUMMARY

Transportation and Economic Development

Transportation is essential for development and an enabler of economic activity. It is also a mirror reflecting the level of economic development of a country. The relationship between transportation and economic development is broad, with the general idea being that transport infrastructures lead to economic development through various channels. However, the relationships between transport and economic development actually occur in two directions. On the one hand, there are linkages that can help explain how transport has an impact on economic activity. On the other hand, economic activity itself can drive and shape the demand for transport (in terms of quantity, type, location, and mode), thus stimulating, and influencing the outcomes of, a transport intervention.

However, the literature usually suggests that the impact of new transportation infrastructure differs by the level of development. According to this approach, in developed countries, where transportation networks are well developed, the gains of additional investment in transportation might be marginal; however, in developing countries, which are usually characterized by inadequate transport infrastructure and inadequate access to affordable transport services, investments in transport are likely to yield massive benefits. However, the multiplicity of factors influencing the linkages between transport infrastructures and development indicates that a set of complementary conditions must be met for transport improvements to translate into improvements in economic performance.

Despite the fact that transport and mobility are important prerequisites for economic progress, social development, and global trade, transportation is highly associated with significant negative externalities. For instance, transportation contributes to air pollution and climate change, road crashes, accidents, congestion, and highly dependent on oil. In 2020, the transport sector was responsible for 57% of world oil demand, 28% of overall energy consumption, and 24% of all direct CO_2 emissions from fuel combustion. Moreover, air pollution, road crashes, and accidents are causing an increase in transport-related risks of mortality. This results in a substantial economic and social burden.

Current transportation practises are deemed unsustainable and pose a significant impediment to economic and social progress. There is an urgent need to move towards sustainable transport systems. Sustainable transportation is a means for the transport sector to embrace sustainable development. Eight of the seventeen SDGs are related to transportation. Sustainable transport may stimulate economic, social, and environmental development, through the improvement of health and well-being (SDG 3), clean energy (SDG 7), sustainable cities (SDG 11), industry innovation (SDG 9), and responsible consumption (SDG 12), while at the same time contribute to the achievement of zero hunger (SDG 2), climate change actions (SDG 13), and clean water and sanitation (SDG 6). In order to achieve sustainability, the transport sector must undergo three major changes: increasing the use of active modes and public transportation; replacing the current fleet of internal combustion engines with zero-emission vehicles; and decreasing car dependence and travel distances.

State of Transportation Networks in OIC Countries

The analysis of transport network densities and capacities in OIC countries for different transport modes highlights the lack of connectivity and capacity in this vital sector as a serious challenge for OIC countries. The length of the road network, standardized per inhabitant and land area, shows that the road network in the OIC countries is modest compared to other groups of countries. In OIC countries, the average road length is 2.5 km per 1,000 people and 16.5 km per 100 km^2 land area compared with 4.6 km per 1,000 people and 33.2 km per 100 km^2 in non-OIC developing countries and 13.8 km per 1,000 people and 48.7 km per 100 km^2 land area in developed countries.

The length of railways in OIC countries tells a similar story. The average length of railway serving 1 million people is only 70.2 km within the group of OIC countries while the world average is 136.9 kilometres – nearly double that of OIC countries. In terms of land coverage, again, the average 4.6 km of railway per 1,000 km^2 land area of the OIC countries is little more than half the world average of 8.3 km and only one-third of the developed countries average of 13.5 km. The weak rail network connectivity in OIC countries translates into low capacity in transporting people and goods, which in turn hinders economic development. The OIC countries, as a group, account for only 4.2% and 3.4% of total passengers and goods, respectively, transported through the rail networks in the world.

Air transportation is no exception to the above. Domestic and international take-offs by carriers registered in the OIC countries was only 1.1 per 1,000 people in 2020. This is below what is observed in non-OIC developing countries (1.6), developed countries (10.5) and the world average (2.7). Despite the low air network density of OIC countries, their capacity in transporting people and goods is relatively good. The OIC countries carried 12% of the world's passengers and 21.2% of the world's freight in 2020. This is an improvement over previous decades; in 2010, for example, OIC countries transported only 12% of the global cargo.

With more than 100,000 km of total coastline, the group of OIC countries possess significant potential for sea transportation. However, the current level of maritime transport network density in the group is far from allowing this potential to be fully exploited. The container port traffic per 1,000 people is measured at 79.3 TEU (20-foot equivalent units) in OIC countries. This is worse than the performance of non-OIC developing countries of 86.8 TEU per 1,000 people and considerably lags behind the 288.2 TEU per 1,000 people observed in developed countries.

The Impacts of Transport Connectivity on Trade

The critical role that a better transport infrastructure plays in expanding trade flows is well recognized. Improved capacity and better connectivity within and across borders boosts trade, fosters growth and generates prosperity. However, there are vast discrepancies in the quality of transport infrastructure across countries and regions, with implications on the volume and structure of trade as well as economic growth and development. There are multiple regional trade and transport corridor initiatives around the world to improve infrastructure connectivity, facilitate the efficient movement of freight, and promote regional integration. The OIC countries, due to their wide geographical distribution, have been part of major international trade and transport

corridors, but the current level of transport linkages among the OIC countries requires further investment to improve connectivity among them.

Infrastructure is an important determinant of transport costs, especially for landlocked countries. Improved transportation with greater speed and reliability played a major role not only in trade growth over the past decades, but also in reorganizations of global networks of production. Demonstration of transport costs in the example of t-shirts showed that lack of transport infrastructure in the destination countries is an important determinant of transport costs to these countries. While it will be more cost-efficient to export the goods to developed countries, it will be costlier to export to developing countries with limited transport capacity. This implies that high transportation costs of parts and components as well as finished products makes the production and delivery processes slow and uncompetitive, and prevent the participation of firms to global value chains. This may lead firms to move to the locations where they have easy access to markets, reshaping the global networks of production.

Even though it is very costly to build efficient transport infrastructure and logistics services, the potential benefits and spillovers are likely to be high for developing countries, including the OIC countries. It is found that countries with better logistics infrastructure have higher capabilities to export and import goods, and this relationship is highly strong. On the other hand, countries that primarily export food and agricultural products are low-income countries with little opportunities for logistics services. Therefore, a well-functioning transportation network significantly contributes to the development of commercial relations among countries.

An evaluation of trade flows through alternative transport modes has revealed that sea transportation accounts for more than 53% of intra-OIC trade, almost 60% of exports from the OIC countries to developed countries, and 56% of exports from the OIC countries to non-OIC developing countries. Road transport is the second most commonly used mode of transport by the OIC countries, which has a particularly high share in their exports to non-OIC developing countries (32.6%). Lack of rail infrastructure prevents the OIC countries from exporting their goods through railways, which accounts only 2-3% of their total exports. Air transportation appears to be relatively strong when the OIC countries export to other OIC countries (16.7%) or developed countries (15%).

The COVID-19 pandemic had significant impacts on the transportation networks, particularly during the early periods of the outbreak. Following 3.8% contraction in 2020, international maritime trade flows bounced back in 2021 with 3.2% growth to a total of 11 billion tons – only slightly below pre-pandemic levels. However, the shortage of shipping capacity and continued disruptions caused by COVID-19, combined with a recovery in trade volumes raised container freight rates to record levels until the first quarter of 2022, which later moderated, but remained elevated when compared to the pre-pandemic levels. Air transport remained much stronger, where some OIC countries took advantage of their previous investments in air cargo and passenger transportation and helped the OIC countries to increase their share in global airfreight to 21.3% in 2020.

Over the coming decades, with the growing importance of developing economies in global trade flows and change in global trade patterns, it is expected to observe significant changes in capacity

requirements and global transport networks. Projected trade and freight flows over the 2050 horizon highlight the need to assess the capacity of existing national infrastructure such as port terminals, airports or road and rail infrastructure to deal with the bottlenecks that may emerge.

Impacts of Transportation on Tourism

With their rich and diverse set of natural, geographic, historical, and cultural attractions, OIC countries, as a group, possess significant potential for the development of a sustainable international tourism sector. On the one hand, the tourism sector is viewed, particularly by the regional economic groups/blocks, as a vehicle for promoting regional integration. On the other hand, transportation networks are seen as an avenue through which countries can address the various tourism development challenges and maximise opportunities thereof.

Yet, despite possessing great potential for the development of the tourism sector, the OIC countries could not reach their full tourism potential. One of the core reasons behind this picture is the underdeveloped transportation networks and limited engagement between the tourism and transportation sectors. A set of other factors at play constitute hindrances in the OIC countries at the nexus of transportation and tourism. These include limited involvement of the private sector, visa costs/tight visa policies, weak joint tourism policies at the regional level, weak state of regional tourism activities, ineffective regulative environment, poor coordination among public authorities and stakeholders, and safety and hygiene-related concerns. Nevertheless, it is seen that the OIC countries with improved transportation networks tend to host more international tourists.

In order to address these challenges and ensure the development of the tourism sector, the OIC countries need to devise long-term strategies as well as medium to short-term coherent plans and programmes in the transportation sector both at the national and OIC cooperation levels. Such policies and plans need to be comprehensive and offer solutions for a wide range of challenges from visa policies to regional transportation networks. These policies should be developed based on evidence and reflect the views of various stakeholders including representatives of public tourism, transport, communication, and security authorities.

Transportation Challenges for Landlocked Countries

Currently, there are 32 countries around the world that are classified by the United Nations as landlocked developing countries (LLDCs). These countries lack direct access to open seas and face special trade and development challenges arising from their landlockedness, a well-recognised issue at the global level. Twelve of the LLDCs are OIC members, located in Africa (Burkina Faso, Chad, Mali, Niger, and Uganda) and Asia (Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan). They represent a group of countries that vary widely in total and per capita GDP and in total land area and population density. However, economically, landlocked OIC countries in Asia are comparatively better off than those in Africa.

LLDCs face a multitude of challenges not only in the field of transportation, but also in overall development, and these two areas are closely linked particularly through the international trade channel. These challenges, which are closely interrelated, include, *inter alia*, long distances to the nearest seaports, dependency on transit countries for access to the seaports, remoteness from

markets, additional border crossings, high transport and transit costs, and limited regional integration.

LLDCs can only trade with a third country after having their goods transit through a neighbouring country to/from a seaport. However, these foreign ports often require transportation of the goods over very long distances, which adds significant costs to trade. Moreover, the problem with transportation from/to foreign ports is not limited to traveling long distances. The challenges associated with additional border crossings pose extra difficulties for the landlocked countries. Having to cross borders adds substantial portions to the overall transportation costs and it takes significant time as well.

Landlocked countries' dependency on one or more transit countries implies additional vulnerabilities to them. Several aspects of dependence on transit neighbours have been shown to be important, including (i) dependence on neighbours' infrastructure, (ii) dependence on sound cross-border political relations, (iii) dependence on neighbours' peace and stability, and (iv) dependence on neighbours' administrative practices. They combine to yield different sets of challenges and priorities in each landlocked country. It is also noteworthy that the transit neighbours are themselves developing countries or even least developed countries (LDCs), often with broadly similar economic structure and hampered by similar scarcities of resources.

Although their connectivity with global markets is completely dependent on the physical and trade infrastructure of transit countries, LLDCs generally have challenges in their own domestic transport infrastructure as well. Road transport is the dominant transport mode in LLDCs, followed by rail, not only for passengers but also for freight. However, they have relatively poor road network in terms of both density and quality when compared to their transit neighbours, and they lag behind the global averages.

A major challenge relevant to inadequate transportation infrastructure is the connectivity with regional transportation networks, considering that LLDCs are highly dependent on regional integration for their connectivity with the world. Concerted efforts are ongoing to improve road infrastructure mainly through regional initiatives, such as the Asian Highway Network and Trans-African Highway. In Asia, the Asian Highway Network, consisting of 143,000 km of roads running across 32 countries, plays a key role in fostering coordinated development of regional roads and connect many LLDCs to internationally recognized transport networks. In Africa, the Trans-African Highway, with a total length of 54,120 km distributed along ten routes, is crucial for the connectivity of LLDCs in the continent. Nevertheless, missing links and road quality remain a major issue in both networks. Similarly, with regard to railway infrastructure; missing links, ageing tracks, and inadequate maintenance characterize railway networks in LLDCs, although projects have been commissioned to revitalize and upgrade railway networks under the framework of the Intergovernmental Agreement on the Trans-Asian Railway Network and Program for Infrastructure Development in Africa (PIDA).

The additional costs incurred to transport from/to distant seaports in transit countries, coupled with the hurdles of border crossings, not only makes landlocked developing countries pay more for freight than their coastal neighbours do, but also makes their exports more expensive. Adding the inadequate transport infrastructure characterized by missing links and poor maintenance and

the vulnerabilities resulting from dependency on transit countries, transportation becomes even more costly, unreliable, and unattractive for landlocked countries, making trade more costly and less profitable for the parties involved. Transport and trade costs inflated by a multitude of factors negatively affects competitiveness of LLDCs and leads to lower trade figures since high transportation costs typically place landlocked countries at a distinct disadvantage relative to their coastal neighbours when competing in global markets.

1. Transportation and Economic Development

Transportation is essential for development and an enabler of economic activity. It is also a mirror reflecting the level of economic development of a country. The effects of transportation are not limited to the economy, but extend to touch the individual lives of people.

The primary goal of transportation is to provide access and connectivity between separate locations for businesses and individuals. For businesses, this entails connecting them with the inputs they need for producing their products and services, with other businesses, and with their customers. For individuals, it entails providing access to their jobs, education services, health services, and social activities among other things. Within this context, each region or country requires quality and efficient transportation infrastructures network to serve intra-regional and inter-regional mobility and to boost its economic and regional development.

This chapter sheds light on the links between transportation and economic growth and development. As this is an extensive topic, it concentrates on the economic impacts of investment in transport infrastructure, based on sources from the international literature. Nevertheless, the chapter also touches on environmental impacts –usually not accounted for by the narrow analyses focusing on the economic aspects– and explores the way forward towards sustainable transportation with reference to Sustainable Development Goals (SDGs).

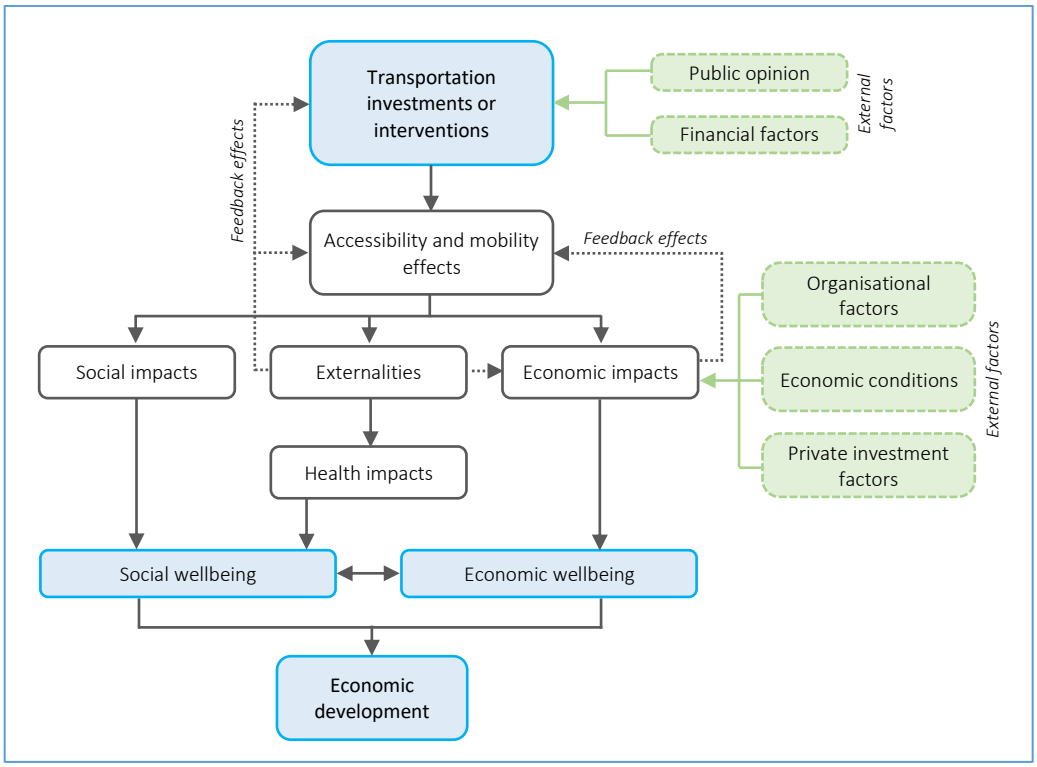
1.1 The Links between Transportation and Economic Development

In the international literature, there is a great number of studies investigating the relationship between transportation and economic development and providing evidence on how and to what extent the transport system can contribute to economic development and growth, at both national and regional levels. In general, the relationship is deemed to be rather complex, and it is particularly difficult to predict the outcome of the changes that an investment in transport infrastructures will have, which may be rather diverse depending on a large number of variables.

Historically, advances in transportation technology and transportation networks, through their impact on transportation costs, access, and connectivity, have been major factors underpinning economic growth and development and opening up formerly isolated areas to people and economic activity. Indeed, transportation plays a key role in reducing the cost of doing business, and providing access and connectivity to areas that otherwise would have been isolated. Lower costs and enhanced accessibility, due to better transport links and services, expand markets for individual transport-using businesses and improve their access to supplier inputs. Increased access and connectivity create increased opportunities for trade, competition, and specialisation, which can lead to longer-term productivity gains. These changes are analogous to the gains from lowering barriers to trade and the expansion of opportunities that come from doing so (NZMT, 2014).

Transport is not only an enabler and facilitator of economic activity but also a major sector of the economy in its own right. Transportation infrastructure constitutes a large portion of total infrastructure expenditure. Calderón et al. (2009) presents estimates of returns on infrastructure that are very robust and methodologically sound. Their estimates of the output elasticity of infrastructure, which rely on a multi-dimensional measure of the physical stock of infrastructure as opposed to infrastructure spending, lie between 0.07 and 0.10. In other words, a 10% rise in infrastructure assets directly increases GDP per capita by 0.7 to 1%.

Figure 1.1: Key Connections between Transportation and Economic Development



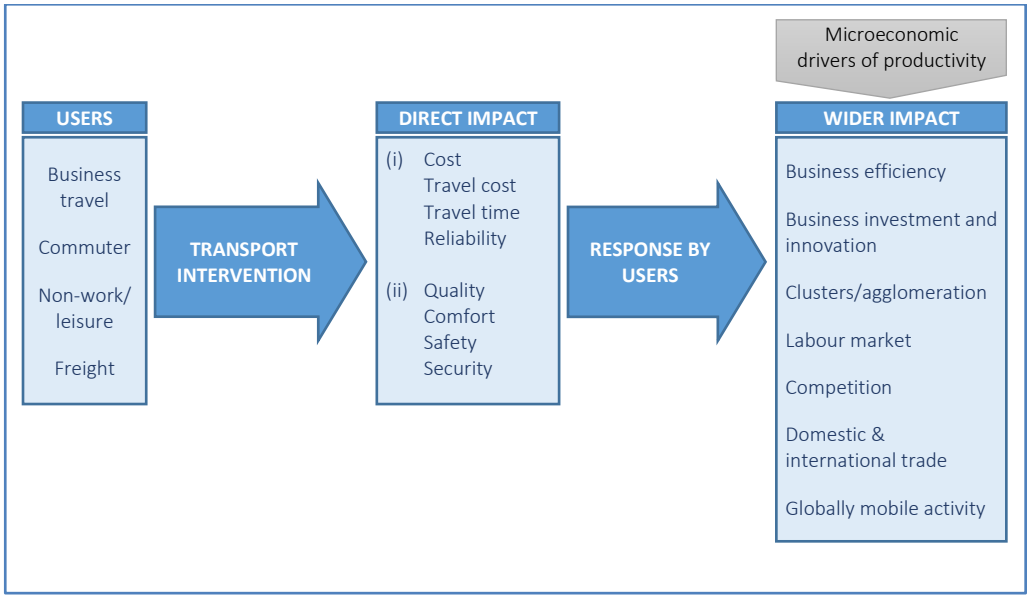
Source: New Zealand Ministry of Transport (2014), as adopted from Leung (2006).

The relation between transportation and economic development is broad and Figure 1.1 does a good job in capturing the multiple overlapping impacts of transportation investment. In a nutshell, transportation has social and economic impacts that positively affect the social and economic wellbeing, thus leading to economic development.

From another perspective, Eddington (2006) describes how transport influences business efficiency and the wider economy through seven “micro driver mechanisms”, as shown in Figure 1.2. The left side of the figure shows the users affected by transportation improvement. In the middle are the direct impacts of transportation improvement on the users. The right hand side shows the different downstream effects that happen in the economy in response to the direct impacts, i.e. the micro driver mechanisms through which transport impacts the economy:

- Increasing **business efficiency**, through time savings and improved reliability for business travellers, freight and logistic operations.
- Increasing **business investment and innovation** by supporting economies of scale or new ways of working.
- Supporting **clusters and agglomerations** of economic activity.
- Improving the **efficient functioning of labour markets**, increasing labour market flexibility and the accessibility of jobs.
- Increasing **competition** by opening up access to new markets.
- Increasing **domestic and international trade** by reducing the costs of trading.
- Attracting **globally mobile activity** by providing an attractive business environment and good quality of life.

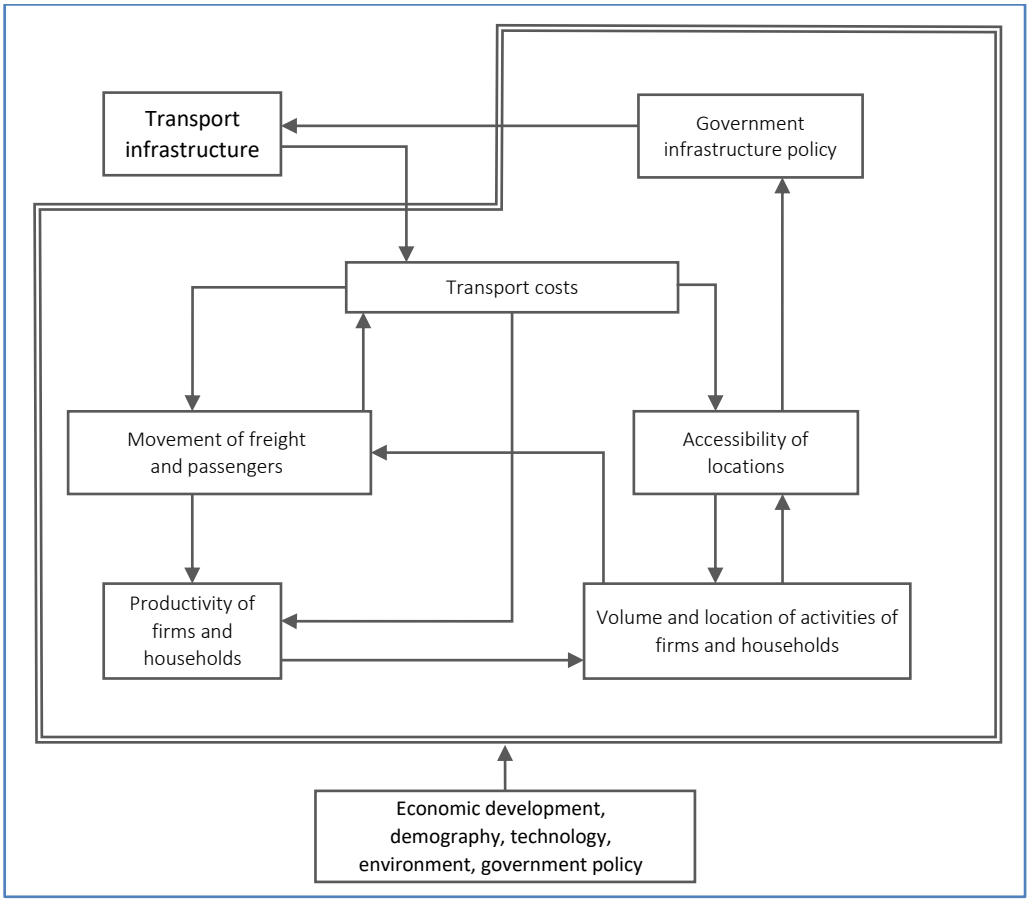
Figure 1.2: Links between Transportation and Economic Performance



Source: Adopted from New Zealand Ministry of Transport (2016).

Thus, it is obvious that transport interventions lead to economic development through various channels. However, the relationships between transport and economic development actually occur in two directions. On the one hand, there are linkages that can help explain how transport has an impact on economic activity. Transport investments and other interventions (such as regulations and pricing) can influence levels, patterns, and locations of economic development, and the provision of facilities for efficient movement of people and goods may contribute positively to the growth of national income. On the other hand, economic activity itself can drive and shape the demand for transport (in terms of quantity, type, location, and mode). As incomes grow, this will encourage a growth of traffic to some extent since, for instance, higher incomes stimulate car ownership and growth of business sales activates the carriage of more freight, which in turn may induce further interventions in the transport system.

Figure 1.3: The Relation between Transport Infrastructure and the Spatial Pattern of Economic Activities



Source: Bruinsma, Rienstra, and Rietveld (1997).

Accordingly, economic development may stimulate, and influence the outcomes of, a transport intervention. This could be observed in Figure 1.3 that presents a conceptual model on the relation between transport infrastructure and the spatial pattern of economic activities. Here, a change in the costs of movement is portrayed as the main mechanism by which changes in transport could have an effect on the economy. Moreover, economic development – in addition to demography, technology, environment, and government policy – is depicted as a factor influencing the development of traffic flows and the spatial pattern of economic activities, i.e. it shapes, in a wider context, the effects of a change in transportation infrastructure on the economy.

Indeed, in developed countries, where transportation networks are well developed, the gains of additional investment in transportation might be marginal; however, in developing countries, who are usually characterized by inadequate transport infrastructure and inadequate access to affordable transport services, investments in transport are likely to yield massive benefits. As SACTRA (1999) put it;

> *Although there are clearly good reasons to believe a well-developed economy must have a well-developed transport system, it does not follow that marginal changes*

> *in investment in transport in an already well-developed economy will necessarily have a big impact on either the level or growth rate of income per head.*

History also seems to support this argument. Eddington (2006) stated "there has been a compelling link between the transport system and economic prosperity throughout history" and commented as follows:

> *History is full of examples of how transport networks have played a critical role in driving phases of particularly rapid economic growth. Step changes in connectivity, often associated with new transport (and more recently communications) technologies, have often been of particular significance.*
>
> *Inter-urban and international connections have permitted radical new production processes and allowed regions and countries to start trading in order to reap the benefits of increasing specialisation in the production of goods and services. The evidence is clear that, in the context of a developing economy, establishing basic connectivity is a very significant contributor to rapid economic growth.*
>
> *In countries with well-established transport networks, where connectivity between economic centres already exists, there is considerably less scope for transport improvements to deliver the periods of rapid growth seen historically… Since most developed economies have well-established infrastructure networks, the relationship between transport and economic prosperity is likely, therefore, to be a more incremental one.*

Thus, once a country's transport system is more established, the emphasis tends to switch from quantum leaps to more incremental improvements to the transport system and its operation – as made possible by ongoing technological advances, efficiency improvements, and regulatory changes. Infrastructure expansion may also be required in response to increases in demand. The links between transport and the economy also tend to become more complex, with transport investment having to meet multiple objectives: these may include improvements in safety, travel conditions, accessibility, environment, integration, and social inclusion. Therefore, an increased proportion of investment may be allocated for infrastructure (and other) schemes that address multiple objectives rather than solely maximise contributions to economic development (NZMT, 2014.)

1.2 Factors Influencing the Links

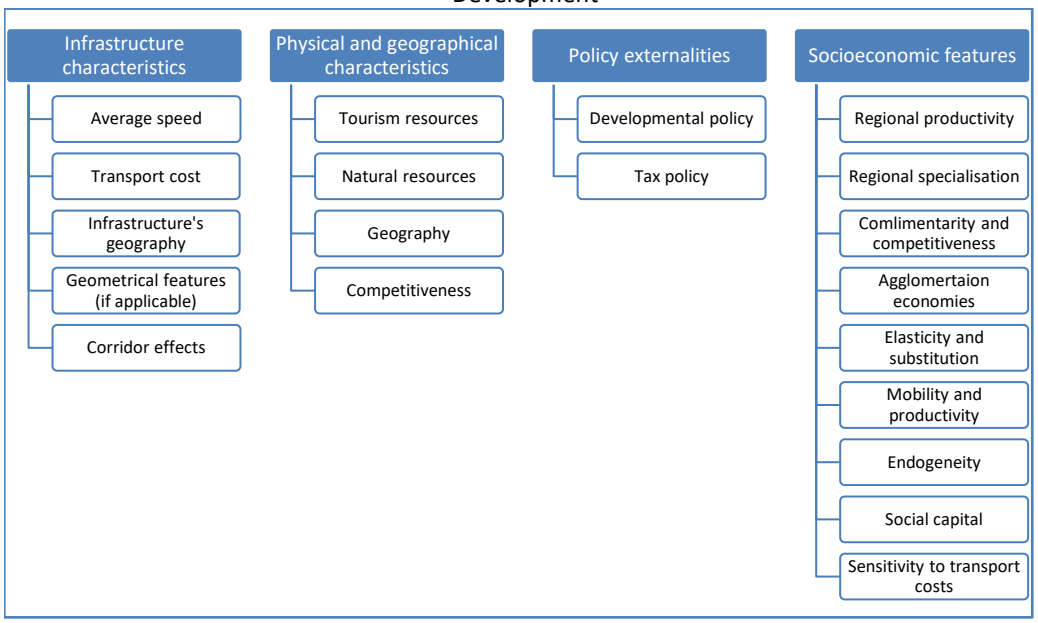
Transportation is an important factor in realising the economic potential of a region; nevertheless, a good transportation system is a necessary but not a sufficient condition for economic development of a region. It is evident that a transport system includes both 'hard' (physical transport networks and vehicles) and 'soft' (institutional settings and the management systems that underpin the coordination of transport services) infrastructure elements. In that sense, the supply side of the transport system can be altered in a number of ways (SACTRA, 1999; NZMT, 2016):

- Additions to, or improvements in, the quality or capacity of transport infrastructure
- Replacement of existing infrastructure assets
- Accelerated additions or replacements during economic recessions when there is underemployed labour and other resources
- Better management of the asset base (clearing breakdowns faster, better management of traffic flows, new services making fuller use of existing infrastructure)
- Changes in costs (e.g. in the case of roads, tolls, parking charges, fuel prices)
- Changes in regulations relating to the delivery of transport services (e.g. changes in competition and regulations affecting entry to public transport and taxi market).

It is obvious that a transport improvement –frequently taken to mean, from a narrow perspective, investment in new infrastructure– will result from any of the above that provides a reduction in costs. Prioritising or balancing among these alterations will vary from time to time and place to place in accordance with specific conditions and strategic considerations. Nonetheless, interventions in transport infrastructure may not yield the expected benefits every time.

Although there is a general consensus on the positive impacts of the transport infrastructures on economic development, there are distinctive differences related to the volume or to the significance of those impacts. This implies that there are a number of factors at play influencing the links between transportation infrastructure and economic development. While features intrinsic to the investment, such as type (road, rail, air, or port) and scale, do have a major role, Polyzos and Tsiotas (2020) summarises a variety of other factors determining the contribution of transportation infrastructures to regional development (Figure 1.4).

Figure 1.4: Factors Determining the Contribution of Transportation Infrastructures to Regional Development



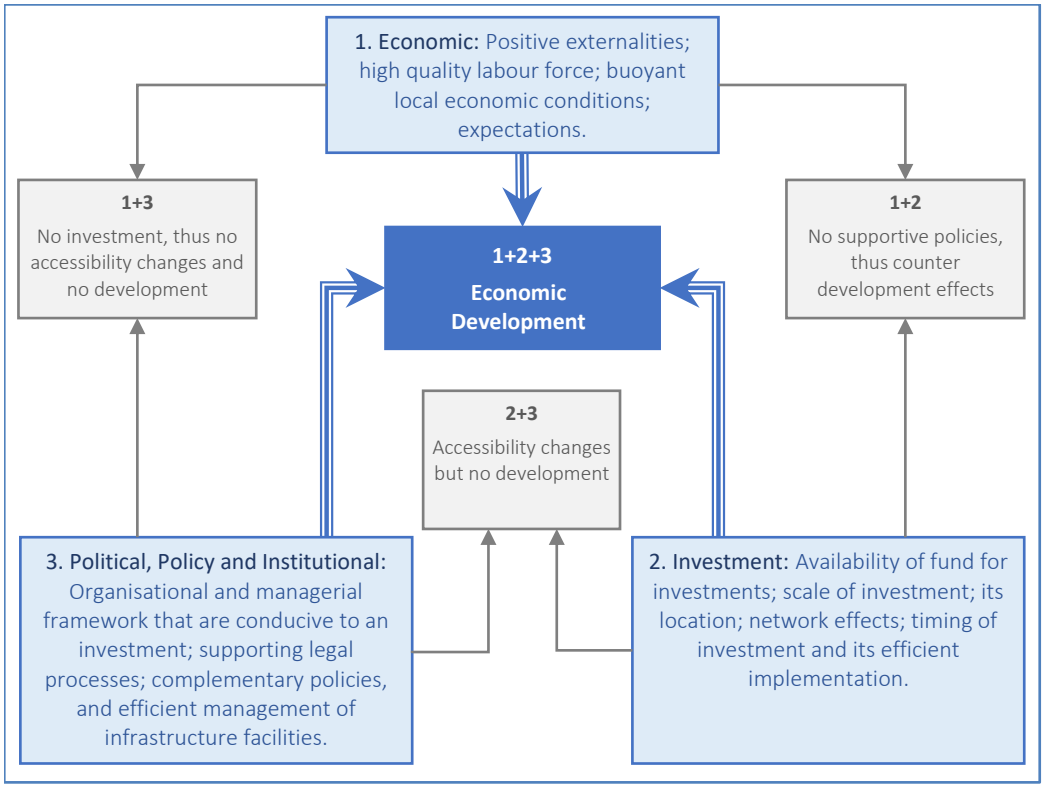
Source: Polyzos and Tsiotas (2020).

The multiplicity of factors influencing the linkages between transport infrastructures and development indicates that a set of complementary conditions must be met for transport improvements to translate into improvements in economic performance. Banister and Berechman (2001) defined a set of necessary conditions for economic development to take place: in addition to the economic conditions, there are the investment conditions and the political and institutional conditions (Figure 1.5). It is argued that it is only when all three sets of necessary conditions are operating at the same time will measurable and additional economic development benefits be found.

Similarly, the UK's Standing Advisory Committee on Trunk Road Assessment (SACTRA) researched the linkages between improvements in transportation and improved economic performance and came to the following conclusion:

> *Theory suggests that there are a number of important mechanisms by which such transport improvements could, in principle, improve economic performance. These include:*
>
> - *reorganisation or rationalisation of production, distribution and land use;*
> - *effects on labour market catchment areas and hence on labour costs;*
> - *increases in output resulting from lower costs of production;*
> - *stimulation of inward investment;*
> - *unlocking inaccessible sites for development; and*
> - *triggering growth which in turn stimulates further growth.*
>
> *Thus measures which reduce transport costs could encourage economic performance in various ways. Businesses can pass on the benefit of lower production costs to consumers in the form of lower prices, or they can implement further efficiency improvements by reorganising production and distribution. The economy can also benefit if lower transport costs help stimulate easier transfer between jobs, or greater competition among firms.* (SACTRA, 1999)

Figure 1.5: Conditions Needed to Translate Transportation Improvements into Improved Economic Performance



Source: Banister and Berechman (2001).

Consequently, the complex nature of the linkages between transportation and economic performance and the fact that it depends on numerous variables largely explains the emergence of different research findings on this subject[1]. Indeed, the empirical results do not offer convincing general evidence of the size, nature or direction of economic impacts, though the existing literature provides a strong theoretical background suggesting that all or part of a successfully achieved transport cost reduction may subsequently be converted into a range of different wider economic impacts. These impacts are, in principle, likely to lead to improved economic performance under certain circumstances. Accordingly, it should always be kept in mind that generalisations about the effects of transport on the economy are subject to strong dependence on specific local circumstances and conditions (see Box 1.1).

[1] The diversity of findings may also be attributed to the issues surrounding the definitions of terms used in the debate about transport and the economy. Drawing attention to a 'confusion of terms' that frequently makes the relationship less clear, SACTRA (1999) states that *the relationship between the two is sometimes taken to embrace different things: transport investment, transport infrastructure, transport improvement (however achieved - ie, by infrastructure development or through other policies), road traffic, etc. Even the term "economic growth" can mean different things to different people and is often confused with loosely defined discussions of competitiveness*.

Box 1.1: Can Transportation Improvements Negatively Affect Economic Development? The 'Two-Way Road' Argument

It is often argued that transportation improvements improve a region's economic prospects, for example, by increasing a location's attractiveness to inward investors, unlocking underutilised resources, and increasing competition among firms. Alternatively, it is also argued that improved transportation by itself may not be sufficient to improve a region's economic performance and that a transport project might suck economic activity out of an area by exposing local firms to competition from stronger rivals outside the area. This is the essence of the so-called 'two-way road' argument, which warns that improved accessibility between two countries (and, similarly, between cities, areas or regions) may sometimes benefit one of them to the disbenefit of the other.

In this regard, transport improvements can actually harm a local or regional economy in some cases. For example, where improved transport links behave in a way similar to the removal or reduction of a trade barrier, there can be winners and losers from the improvement, depending on, among other things, the structure of local and regional economies. Poor transport links between one region and another, it is argued, can protect uncompetitive indigenous firms, enabling them to charge high prices. Removing that effective barrier through improved links could benefit the wider regional economy by reducing prices to end consumers and producers.

Sometimes, transport improvements simply shift economic activity from one area to another without creating aggregate economic benefits. Moreover, even if a transport improvement does have a positive impact on more than one area, it may not necessarily result that all affected areas will benefit equally. For example, some areas are likely to benefit more than others from reductions in freight transport costs arising from construction of a motorway.

Thus, it is emphasised that it is hard, in general, to say whether the net effect of improved transport links is positive or negative. While the lack of an effective transport system does appear to be a constraint on a regional economy achieving its full production potential in some regions, it may not be the case in some other regions where simply improving transport would not lead to growth without other parallel interventions.

Source: SACTRA (1999).

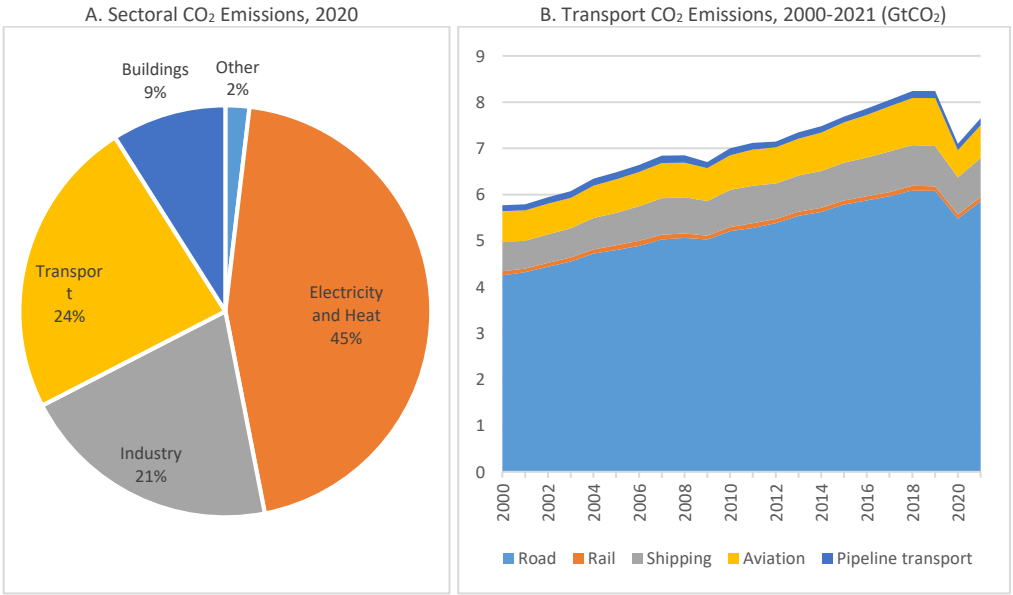
1.3 Sustainable Transportation

Transportation is a crucial driver for economic and social development. Transportation systems provide individuals access to employment, education, health care, and facilitate international trade. However, transportation is frequently associated with substantial environmental impacts, such as emissions that contribute to air pollution and global warming. Transport also incurs negative externalities (social costs) from road damage, accidents, congestion, and its heavy reliance on oil. Therefore, in order to support socioeconomic development with minimal social costs, it is necessary to move toward more sustainable transport systems.

Externalities from Transportation

The transport sector remains a major contributor to greenhouse gas (GHG) emissions and climate change. It accounted for 57% of global oil demand and 28% of total energy consumption in 2020 (United Nations, 2021). Having significant portion in oil and energy consumption, the transport sector was responsible for 24% of all direct carbon dioxide (CO_2) emissions from fuel combustion in 2020 (Figure 1.6.A). This means that transportation is the second largest source of CO_2 emissions, after the production of electricity and heat. Figure 1.6.B depicts the evolution of CO_2 emissions for various modes of transportation from 2000 to 2021. Increased car ownership and travel as a result of economic development have led to constant rises in GHG emissions from transport, with CO_2 emissions peaking at 8.2 $GtCO_2$ in 2019 before declining to 7.1 $GtCO_2$ during the COVID-19 pandemic in 2020. Despite a substantial fall, the post-pandemic recovery tends to show an uptrend. Transportation-related CO_2 emissions are estimated to reach 7.7 $GtCO_2$ in 2021, a 7.7% rise from 2020. By far, passenger road vehicle transport accounts for the largest contributor of CO_2 emissions, accounting for 76.6% of the total. The remaining emissions are generated by rail (1.2%), shipping (11%), aviation (9.3%), and pipeline transport (2.0%).

Figure 1.6: Global CO_2 Emissions



Source: IEA (2021) and IEA (2022).

Transport-related air pollution is a major source of smog and poor air quality, which have adverse effects on health and wellbeing. Air pollution is a "silent killer" that recently surpassed other well-known risk factors for chronic diseases (such as obesity, high cholesterol, and malnutrition) to become the fourth biggest risk factor for death globally. Moreover, air pollution indirectly affects the quality of life by reducing working hours, lowering productivity, and causing forced migration (Oliva et al., 2019).

Globally, 6.7 million people died prematurely in 2019 due to air pollution, including 1.6 million from OIC countries (SESRIC, 2021). The global welfare costs associated with the premature deaths

caused by outdoor air pollution exceeded $3 trillion in 2015 and are expected to reach $25 trillion by 2060 (OECD, 2016).

The risk of mortality from transportation becomes more daunting when traffic accidents and crashes are taken into account. According to the WHO (2018), more than 1.25 million people are killed and up to 50 million are injured in road crashes every year. Developing countries are disproportionately at risk, accounting for more than 90% of all reported deaths (United Nations, 2021). Crashes on the road pose a considerable strain on health systems and other services, as well as grief and suffering on individuals and communities. The combined injury and societal expenses associated with car crashes impose a substantial financial burden on the economy. According to World Bank (2022), deaths and major injuries alone cost the economies of low- and middle-income countries around $1.7 trillion and 6.5% of their gross domestic product (GDP).

Transport sector externalities are also related with its land-use implications. In both urban and non-urban settings, transportation infrastructure consumes land that may be put to other use. Therefore, land use patterns and the associated economic, social, and environmental impacts are influenced by transportation planning decisions. These include direct impacts on land used for transportation facilities and indirect impacts on overall land-use development pattern (Litman, 2022). For example, cars need a lot more space for travel and parking and have a longer moving area than public transportation, biking, and walking. Building more urban highways increases pavement area and encourages more spread-out, car-oriented development (sprawl). On the other side, enhancing walking, cycling, and public transportation infrastructure favours compact, infill development.

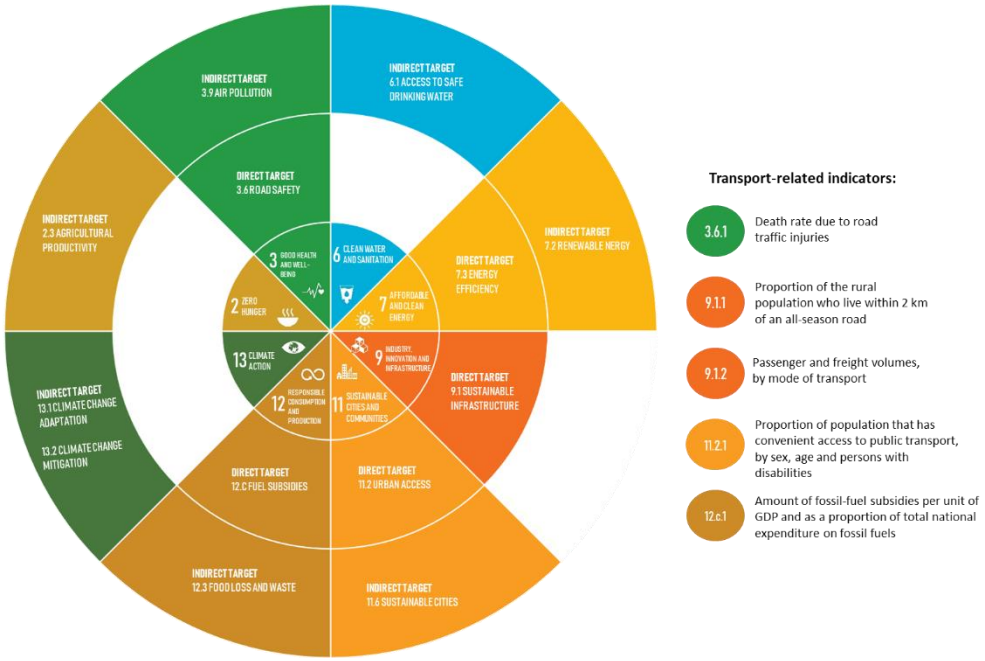
Transport and Sustainable Development

When all relevant externalities are considered, it is clear that the current transportation system is unsustainable and poses serious obstacles to economic and social progress. Sustainable transport, as a means for the transport sector to embrace the concept of sustainable development, has captured the interest of academics, industry professionals, and governments and become a global discourse in the past few years.

At the 2012 United Nations Conference on Sustainable Development (Rio +20), world leaders agreed that improved transportation and mobility are critical to sustainable development. Sustainable transportation enhances economic integration while safeguarding the environment and enhancing social equity, health, urban resilience, and urban-rural connections, as well as rural productivity (United Nations, 2021).

Subsequently, recognizing its importance, in 2014, the United Nations (UN) Secretary-General appointed a High-Level Advisory Group on Sustainable Transport (HLAG-ST) with the responsibility to propose policy recommendations that encourage the accelerated implementation of sustainable transport. In their first report, the Advisory Group defines sustainable transport as "*the provision of services and infrastructure for the mobility of people and goods—advancing economic and social development to benefit today's and future generations—in a manner that is safe, affordable, accessible, efficient, and resilient, while minimizing carbon and other emissions and environmental impacts*" (HLAG-ST, 2016, p.10).

Figure 1.7: Relevant Targets of Sustainable Transport in SDGs



Source: SLOCAT (2019).

In the 2030 Agenda for Sustainable Development, eight of the seventeen Sustainable Development Goals (SDGs) address sustainable transport, with direct and indirect targets. Figure 2 illustrates the cross cutting role that transport has in sustainable development. Transport has direct relevance in SDG 9; indirect relevance in SDGs 2, 6, and 13; and both direct and indirect relevancy in SDGs 3, 7, 11, and 12 (UN-Habitat et al., 2015). Therefore, transport stimulates economic, social, and environmental development, through improvement of health and well-being (SDG 3), clean energy (SDG 7), sustainable cities (SDG 11), industry innovation (SDG 9), and responsible consumption (SDG 12), while at the same time contribute to achievement of zero hunger (SDG 2), climate change action (SDG 13), and clean water and sanitation (SDG 6).

Sustainable transport is best seen not as an end in itself, but as a means to another goal. To become sustainable, transport not only involves the development of transport infrastructure and services, but also the ease of reaching locations in terms of accessibility, comfort, and security. Transport is important and a crucial enabler for achieving the sustainable development. By ignoring sustainable transportation, it will be far more difficult to fulfil the majority of the specified targets in SDGs.

Realizing Sustainable Transport Solutions

Despite the rise of sustainable transportation on the global agenda, according to the Sustainable Transport, Sustainable Development Report (United Nations, 2021), currently only half the world's urban population has convenient access to public transportation and over one billion rural population remain unconnected to a good quality road network. Transport access for vulnerable populations also remains a key issue, as the poor often cannot afford public transport and spend a fifth of their income on it.

Nonetheless, different international conventions and multi-stakeholder initiatives relating to sustainable transport have constantly been made. The Partnership on Sustainable, Low-Carbon Transport (SLoCaT), a multi-stakeholder partnership established in 2009 by more than 90 organisations, promotes the incorporation of sustainable, low-carbon transport into global policies on sustainable development and climate change. In addition, SLoCaT leverages action to assist the implementation of these global policies in developing countries. Sustainable Mobility for All (SuM4All), which was founded at the 2016 Climate Action Summit, strives to make transportation and mobility more equitable, efficient, safe, and environmentally friendly. Furthermore, during the second United Nations Global Sustainable Transport Conference, held in 2021, it was noted that expediting the transition toward sustainable transport would be essential to establishing a global community with shared futures. In addition, it outlines a vision for sustainable global transport and proposes action plans to promote cooperation in the transport sector.

Box 1.2: Istanbul Sustainable Urban Mobility Plan

Istanbul is a metropolis of culture and business that attracts visitors from around the globe and is home to 15.8 million people. Rapid urbanisation, a growing population, and rising mobility demand have caused traffic congestion and mobility issues in the city.

In 2022, Istanbul Metropolitan Municipality (IMM) launched the Istanbul Sustainable Urban Mobility Plan (SUMP) under the scope of the Global Future Cities Programme (GFCP). The vision of the Plan is to develop an inclusive and creative transportation system with a focus on people and the environment, offering a mix of safe, integrated, accessible, and affordable mobility options suitable with Istanbul's distinctive topography and historical values for a resilient future. It also focuses on minimising automobile reliance as well as the negative impacts of carbon emissions, air and noise pollution, and traffic accidents.

The vision is built on nine major objectives and 26 core initiatives grouped under three themes: low-carbon transition, seamless transfer and integration, and congestion reduction. With a predicted increase in population to 18 million and the number of daily trips in the city to 38.1 million, it is expected that the following goals will be met by 2040:

- Reduce transportation fatalities to zero.
- Reach 100% use of electric vehicles.
- Increase daily walking and public transportation travel to 70%.
- Increase the share of rail system in public transit to 47%.
- Reduce carbon emissions from transportation by 60% in 2040 and reach net-zero in 2050.

Source: Arup (2022)

Various initiatives at the national and municipal levels have also been launched to realise the aspiration of sustainable transportation. In the European Union (EU), the EU White Paper on Transport states that by 2050, greenhouse gas emissions from transportation must be reduced by at least 60% relative to 1990 levels. The Paper also argues that higher population densities will lower the travel distance of vehicles in urban areas, while public transportation options will

expand. Other countries have also made commitments to sustainable transportation, primarily as part of their net-zero climate objectives (United Nations, 2021)

In its role as an enabler, sustainable transport, indeed, not only can accelerate progress towards the SDGs, but also is crucial towards the achievements of climate targets. According to Global Roadmap of Action Toward Sustainable Mobility (Sustainable Mobility for All, 2019), to reach the Paris Agreement target (of keeping global temperature increase of 1.5°C), global GHG emissions from the transport sector need to be reduced by 2– 4 billion tons by 2050, with net-zero emissions in the decades thereafter. Consequently, a substantial change of the transportation system is required urgently.

Transforming the global transportation system with the ultimate goal of achieving net-zero emissions will require three key transition in the transport sector (Boehm et al., 2022). First, travel must move toward active modes and public transportation. Active modes, such as walking and cycling, continue to be among the most sustainable, low-carbon modes of transportation, particularly for shorter distances in urban settings, with the added benefit of enhancing health via physical activity. Alternatively, the expansion of public transit, such as electric buses, trains, and Bus Rapid Transit (BRT) systems, may convey people far more effectively than cars (IISD, 2019).

Second, internal combustion engine vehicles must be phased out and replaced with zero-emission vehicles on the road. Road transport is the leading source of CO^2 emissions from transportation. Consequently, it is essential to seek out alternate zero-carbon fuels for road transportation. Current trends indicate a growth in the use of electric vehicles (EVs). When driven by low-carbon electricity, EVs can reduce GHG emissions from the greatest sources in the transportation sector, such as automobiles, motorcycles, buses, and trucks.

Finally, Transport systems must be decarbonised through a combination of demand-reduction policies and low carbon technologies. Reducing car dependence and travel distances (primarily by car and by plane) is a crucial shift in the transportation system, particularly in high-income regions where car dependence is significant. Reducing car dependence and travel distance requires a combination of multimodal planning, transportation demand management that encourage travellers to use the most efficient mode of transportation, and smart growth development policies that create communities that are more compact where it is simple to navigate without a private vehicle (Boehm et al., 2022).

2. State of Transportation Networks in OIC Countries

The main objective of transportation is to provide access and connectivity to people, places, goods and services. The core components of transportation include public transit, roadways, rail systems, vehicles, aviation, seaports, and even bike and pedestrian pathways. Developing transportation networks is essential to meeting the demands of a growing population. It allows people to access goods, services, education, employment, and recreation opportunities. It helps facilitate trade and commerce, and provides the foundation for a vibrant economy. To put simply, transportation is an essential part of a country's infrastructure, providing a way for communities to stay connected.

Transportation services are realised under certain constraints such as safety, cost, comfort and time that depend on the geographical location of the delivery and destination. Each mode of transportation – road, rail, sea, and air – has advantages in addressing some of the constraints compared to the alternatives. Therefore, the mode of transportation is selected based on the main goals, preferences and transportation needs, considering the above constraints or criteria.

Furthermore, the governments also make decisions on investments in transport infrastructure, taking into account numerous factors such as the country's geographical location and economic and strategic development plans. Eventually, transportation infrastructure for all modes of transportation has to be systematically planned and developed as it is one of the fundamental factors of economic development, particularly, in the trade and tourism sectors.

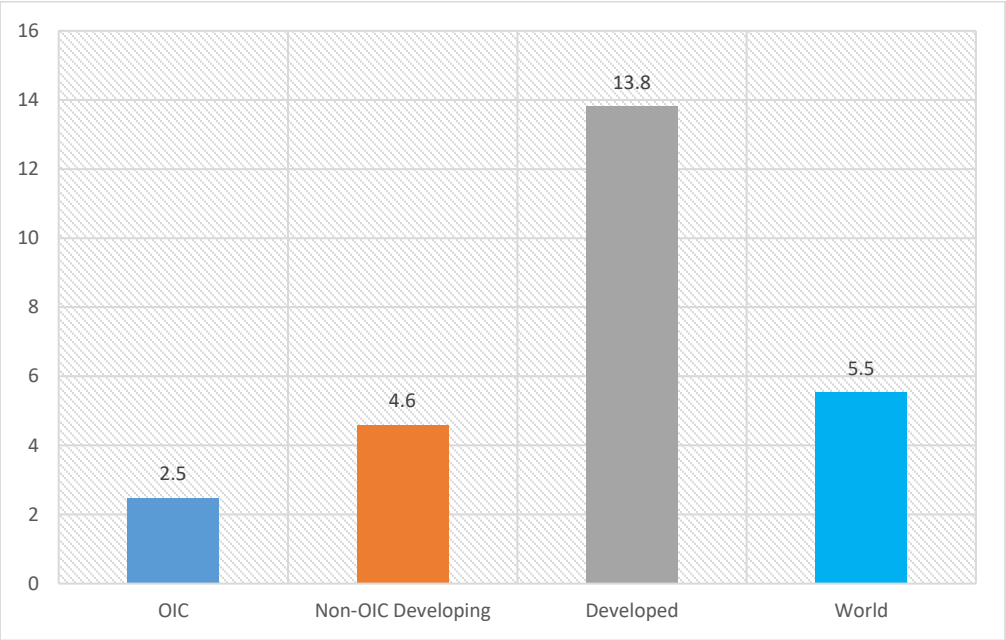
This chapter analyses OIC countries' transport network densities and capacities across different modes of transport. The chapter also evaluates OIC countries' overall logistical performance in transportation. Final remarks and recommendations are made after taking into account recent developments in the transportation sector.

2.1 Road Transportation

Road transport is one of the most important and widely used modes of transportation. The reason why road transport is so popular is that it has many advantages over other alternatives. First, compared to other modes of transportation, road transportation requires a significantly lower capital investment. Its maintenance costs are considerably lower. Besides, it is best suited for transporting supplies and people between rural areas that are not served by rail, water, or air travel. When transporting people and goods over short distances, it is more efficient and quicker, and its schedule can be easily modified to meet individual needs. The downsides of using the road for transportation are mixed, though. The first drawback is that it is expensive to transport cheap, bulky items over long distances. Given its seasonal nature and a higher likelihood of accidents and breakdowns, it is also less reliable than rail transportation.

To understand the level of road network connectivity in perspective, there is a need to standardise the road length figures according to population and land size. Road network length, when standardised on a per capita basis, can be considered a proxy for measuring the extent to which every person in any given country or region is served by roads. In comparison, road network length standardised per land area can explain how well cities and regions of a country are interconnected with each other.

Figure 2.1: Road Network Density - Road Length (km) per 1,000 people, 2020[1]

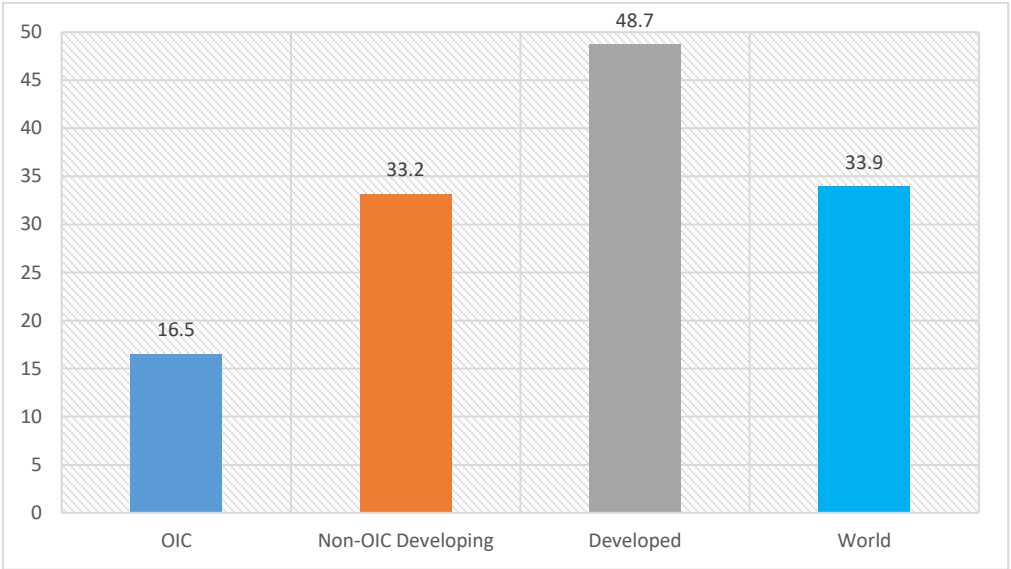


Source: SESRIC staff compilation based on data from the World Road Statistics (WRS) Datawarehouse of the International Road Federation (IRF) accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2015 and 2020.

The length of road network per capita is low within the group of OIC member states when compared to non-OIC developing countries, developed countries as well as the world average. Based on the most recent data available, the average road length for 1,000 people living in the OIC member countries is calculated as 2.5 km, which compares poorly to the world average of 5.5 km (Figure 2.1). The average road density is 4.6 km in non-OIC developing economies, while, in developed economies, every 1,000 persons are served by as much as 13.8 km of road network.

When standardisation is based on the land area, the average road network of 16.5 km per 100 km^2 land area within the OIC countries group is almost half that of non-OIC developing economies (33.2 km) and approximately one-third of that of the developed economies (48.7 km). The world average is 33.9 km (Figure 2.2). Road network density -measured through either approach- points to the strong need for further development of road networks in the OIC countries.

Figure 2.2: Road Network Density - Road Length (km) per 100 km^2 of Land Area, 2020[1]



Source: SESRIC staff compilation based on data from the World Road Statistics (WRS) Datawarehouse of the International Road Federation (IRF) accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2015 and 2020.

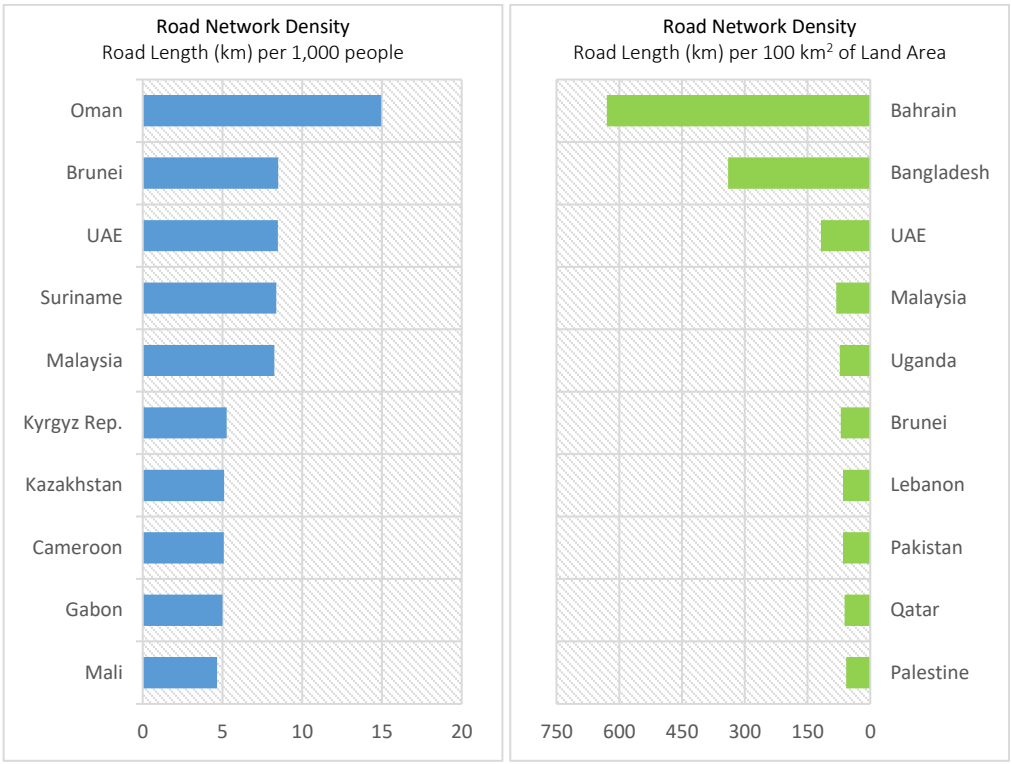
Among the OIC countries, Oman stands out as the top performer in terms of road density on a per capita basis, with 15 km roads per 1,000 people. Oman's performance is even higher than the developed countries' average of 13.8 km per 1,000 people. In addition to Oman, the road density per capita is above the global average in four other OIC countries: Brunei Darussalam (8.5), United Arab Emirates (8.5), Suriname (8.4), and Malaysia (8.3) (Figure 2.3, left side).

When it comes to road density with respect to land area, the top ten OIC countries, shown on the right side of Figure 2.3, perform relatively well, all with a value exceeding the average observed in developed countries. Bahrain, in particular, is among the world leaders in this indicator, ranking among the top 6 countries in the world.

Another area of vital importance related to road networks is road safety. In 2019, 1.28 million people died of road traffic accidents. The majority of these deaths occurred in developing countries. Around 874 thousand deaths (68% of world) in non-OIC developing countries and 334 thousand deaths (26% of world) in OIC countries happened as a result of road traffic accidents.

The challenge of road safety in OIC countries is a serious one with the number of deaths per capita in OIC countries exceeding the global and developed countries group averages. SESRIC staff analysis based on data from the World Health Organization (WHO) shows that developed countries demonstrated a significant progress in improving road safety that lead to a considerable decline in the rate of mortality attributed to road traffic accidents over the last two decades.

Figure 2.3: Top Ten OIC Countries in terms of Road Density, 2020[1]

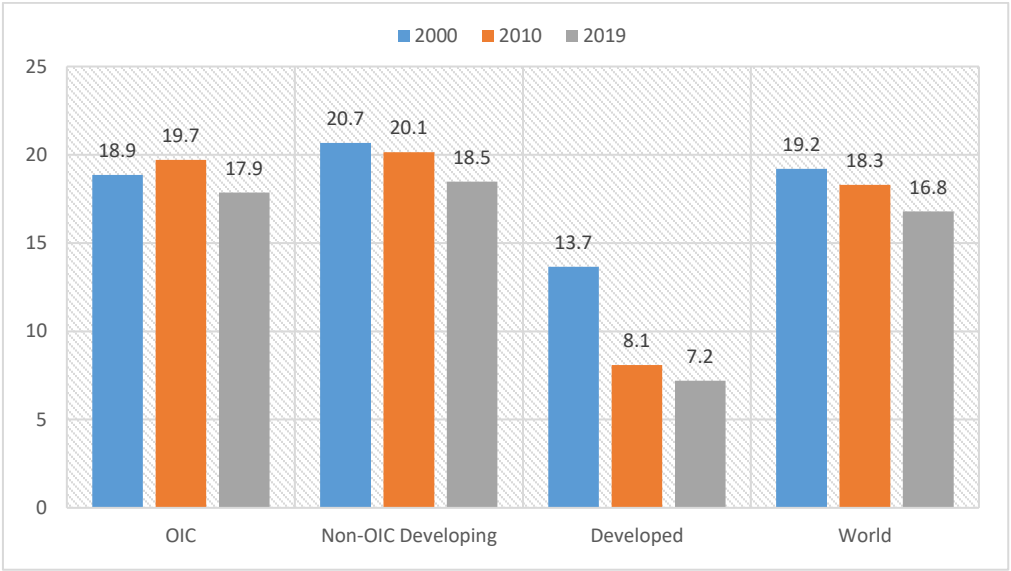


Source: SESRIC staff compilation based on data from the World Road Statistics (WRS) Datawarehouse of the International Road Federation (IRF) and the World Development Indicators (WDI) online database of the World Bank, accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2015 and 2020.

Figure 2.4 shows that the estimated road traffic death rate per 100,000 people visibly dropped from 13.7 in 2000 to 7.2 in 2019 in developed countries, while it fell from 18.9 to 17.9 in the OIC countries and from 20.7 to 18.5 in non-OIC developing countries. This state of affairs necessities that OIC countries take concrete measures to address this challenge.

In 32 OIC countries, the estimated total number of traffic deaths exceeds the global average of 16.8 per 100,000 people as of 2019 (Figure 2.5). Saudi Arabia, Sierra Leone, Chad, Guinea-Bissau, Burkina Faso, Cameroon, Mozambique, Guinea, Gambia, and Uganda are the ten most severely impacted nations in terms of death rate. Some OIC countries are making valuable efforts to reduce the number of fatal cases. Particularly, Saudi Arabia targets to reduce the number of deaths related to road traffic accidents from 36 per 100,000 people in 2019 to 10 per 100,000 people by 2030. Road safety is one of the pillars of the National Transformation Programme of the Kingdom towards its ambitious social and economic reform plan – Vision 2030 (WHO Results Report, 2020). This initiative is expected to transform Saudi Arabia from one of the ten most severely impacted countries by traffic accidents in the OIC and the world to one of the countries with the safest roads by 2030.

Figure 2.4: Estimated Road Traffic Death Rate (per 100,000 population)

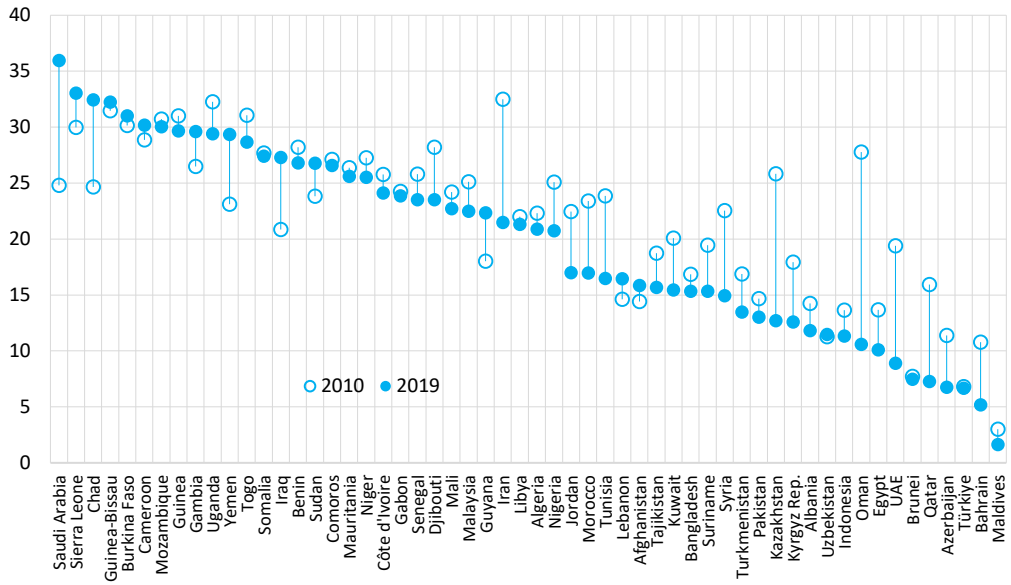


Source: SESRIC staff compilation based on data from the Global Health Observatory (GHO) data repository of the World Health Organization (WHO) accessed on 19/10/2022.

The 10 least affected countries from traffic accidents (in terms of death rate) were Maldives, Bahrain, Türkiye, Azerbaijan, Qatar, Brunei Darussalam, United Arab Emirates, Egypt, Oman, and Indonesia, as of 2019. With regard to the progress over time, 42 OIC countries showed some improvement between 2010 and 2019, most notably Oman, Kazakhstan, Iran, United Arab Emirates, and Qatar. State-level initiatives played a part in achieving such remarkable results in these OIC countries. For instance, in the United Arab Emirates, the strategic plan of the Roads and Transport Authority for 2014-2018 acted as a major support to the management of road traffic. Furthermore, the Traffic and Patrols Directorate in Abu Dhabi launched a road safety management plan, which aimed at decreasing traffic fatalities to 3 per 100,000 inhabitants by 2021 (United Arab Emirates Government Portal, n.a.).

In contrast, in 14 out of 56 member countries with available data, the rate of traffic deaths increased between 2010 and 2019 (Figure 2.5). More action is required by the OIC countries in order to significantly reduce the death rate from traffic accidents. The OIC countries should concentrate on managing and enforcing road safety, establishing legislations that ensure the protection of road users, and launching public awareness efforts. Investment and development of road infrastructure, the development of national road safety strategies, the implementation of public policies aimed at reducing traffic-related injuries and fatalities, and the implementation of enforcement tactics for seatbelt and helmet use are all examples of this. In order to help those hurt in accidents, member countries should also expand access to emergency care services, such as ambulances and trauma centres.

Figure 2.5: Estimated Road Traffic Death Rate (per 100,000 population) in OIC Countries, 2010 vs 2019



Source: SESRIC staff compilation based on data from the Global Health Observatory (GHO) data repository of the World Health Organization (WHO) accessed on 19/10/2022.

In this regard, the COMCEC report titled "Improving Road Safety in the OIC Member Countries" is a good reference and the general recommendations in the report are worth mentioning again here:

- Applying a *Safe Systems Approach* by developing a road transport system that accounts for human error and the vulnerability of the human body and considering all the road safety aspects, as reflected in the five road safety pillars, in an integrated way.
- *A cohesive approach with clear tasks and responsibilities*. Knowing the multi-disciplinary character of road safety and the large number of stakeholders involved, it is important to develop a cohesive approach, which can be reinforced by appointing a lead agency.
- *Raising awareness for road safety*. This is relevant throughout society, from politicians, having to place road safety on the political agenda, through to children, who need to be educated on road safety.
- *Knowledge transfer and capacity building*, leading to a knowledge base that is shared between the various stakeholders involved in road safety.
- *Sound understanding of road safety* is crucial, and is reflected in research in the following areas:
    - Analysis of crash types and crash factors, as a basis for defining effective measures.
    - Further analysis related to motorisation level and travel behaviour, as a basis for understanding the context of road safety (COMCEC, 2016).

Box 2.1: Developments Driving the Change in the Road Transport Industry

Some technological developments in the transportation sector are expected to have a significant impact on the economy, with the potential to reduce traffic congestion and improve road safety. These include:

- The development of autonomous vehicles.
- The rise of ride-sharing services such as Uber and Lyft.
- The increasing popularity of electric vehicles.
- The expansion of public transportation options.
- The growth of the bicycle-sharing industry.

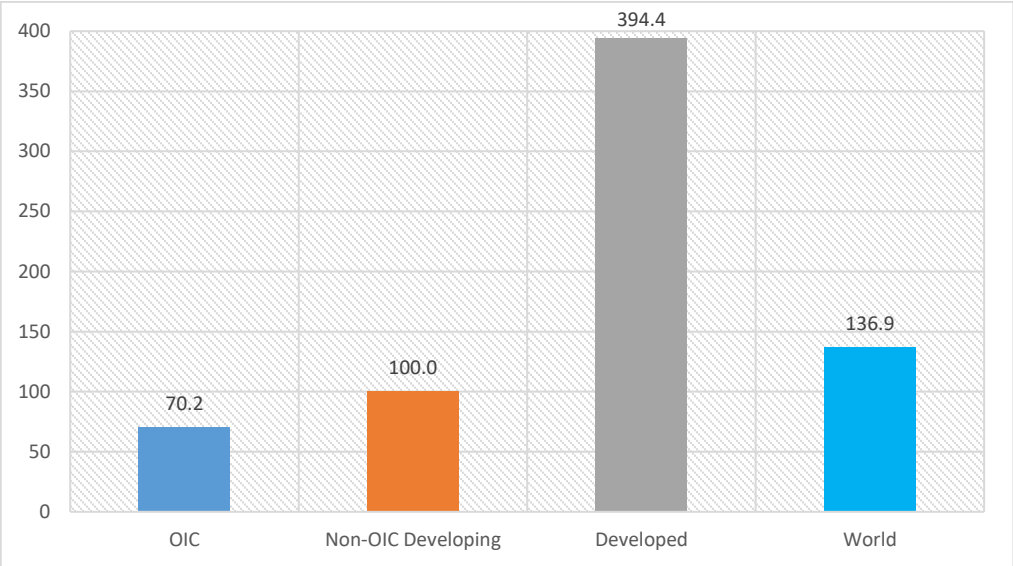
Environment is anticipated to be greatly impacted by these technological advancements, which have enormous potential to reduce emissions, improve air quality, and increase fuel efficiency. Particularly, autonomous vehicles sector is a major focus of the automotive industry. The development of autonomous vehicles is also expected to have a considerable impact on the workforce, with the potential to create new jobs in the manufacturing and maintenance industries and other service providers while partly reducing the demand for human drivers.

The development of above transportation means and services can provide economic development benefits to a nation by increasing transportation options and improving access to transportation. The largest operators of the autonomous vehicles today are companies like Google, Tesla, and Uber. According to S&P Global Market Intelligence, the number of autonomous vehicles on the road is projected to grow to nearly 21 million by 2030. US and China are the leaders in the field. Other countries with a significant number of autonomous vehicles include the United Kingdom, Germany, Japan, and Singapore.

2.2 Rail Transportation

The invention of the railway is considered to be one of the most important technological inventions of the late 19th century. This is mostly due to the fact that railway transport is the most reliable mode of transport as it is the least affected by weather conditions compared to the other modes of transportation. Another advantage of rail transport is that it is better organized than any other form of transport. It has fixed routes and schedules. It is also economical, quicker and best suited for carrying heavy and bulky goods over long distances. In some situations, these advantages can be outweighed by its disadvantages. The first disadvantage of railroad transportation is that it requires a large capital investment and this may give rise to monopolies and work against the public interest at large. In addition, railways cannot be operated economically in rural areas and short-distance transfers. To put the total rail length figure into perspective, there is a need to standardise the length of rail lines with respect to population and land area.

Figure 2.6: Rail Network Density - Rail Length (km) per 1,000,000 people, 2019[1]



Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2002 and 2019.

The OIC average was calculated using data for 36 out of 57 member countries. Regarding the missing countries, reliable data for Afghanistan, Brunei Darussalam, Guinea, Guyana, and Togo are not available. Although there are rail lines operating in the State of Palestine, they are located in territories occupied by Israel. Bahrain, Chad, Comoros, Gambia, Guinea-Bissau, Kuwait, Libya, Maldives, Niger, Oman, Qatar, Sierra Leone, Somalia, Suriname, and Yemen are the remaining 15 OIC countries that do not have operational railways.

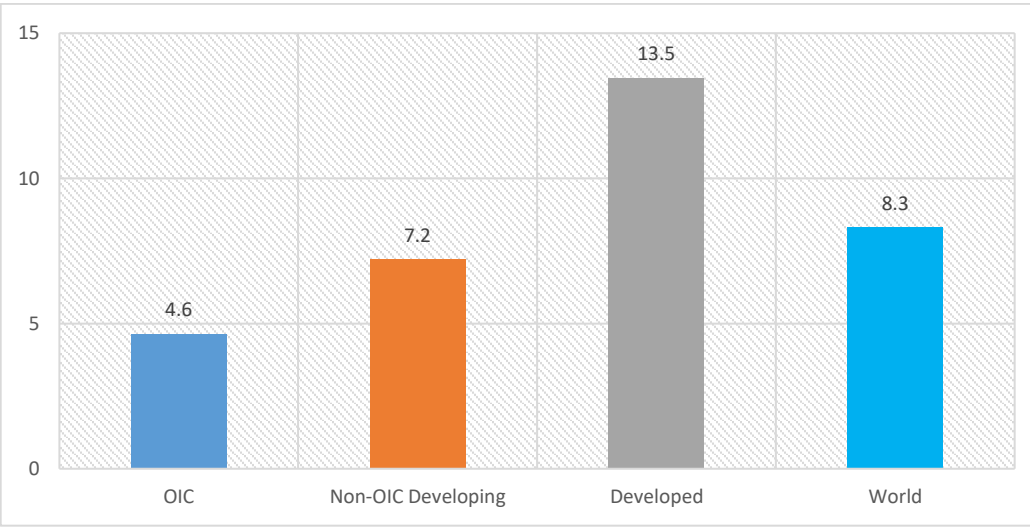
There are, however, ongoing railway projects, such as the Gulf Railway, which connects all GCC countries, including Bahrain, Kuwait, Oman, and Qatar, which previously did not have railways but are now constructing internal railways as well. These projects include new line construction, line upgrades, and the development of rail infrastructure within these countries. Niger is also planning a new railway line to connect the country's north and Sub-Saharan regions, while Libya, one of the world's largest countries with no operational railways, is resuming construction of railway projects that had been suspended since 2011 due to a military crisis. Another important railway initiative with a significant potential to promote regional cooperation, particularly among the West and East African OIC countries, is the Dakar-Port Sudan railway corridor project (Box 2.2).

Box 2.2: OIC Dakar-Port Sudan Railway Corridor Project

The realization of a Dakar-Port Sudan Railway connection is a project supported by the OIC, with the aim of providing an important transportation link between the OIC Sub-Saharan countries, crossing the whole of Africa from West to East, with the aim of fostering multilateral economic development and expanding global prosperity. The project was launched by Sudan in 2005, presenting it to that year's OIC summit. Subsequently, at the 11th Session of the Islamic Summit Conference, held on 13-14 March, 2008 in Dakar, Senegal, the resolution was taken from the promotion of the new Dakar-Port Sudan railway infrastructures, crossing the territories of Senegal, Mali, Burkina Faso, Niger, Nigeria, Chad, and Sudan. The Summit also decided to include the Republic of Djibouti in the Feasibility Study of this project. The following 35th Session of the Council of Foreign Ministers held in Kampala, Uganda, on 18-20 June 2008, decided to extend the links to the Republic of Guinea, Cameroon, Uganda, and Gambia, thus creating a real transportation corridor that, besides providing the uninterrupted connection between the Atlantic and the Red Sea (and thereafter the Indian Ocean), would increase traffic facilities through the main ports of the Gulf of Guinea, such as Lagos, Conakry, and Yaoundé.

As of 2019, rail network density with respect to population (measured as the length of railways per 1,000,000 people) is only 70.2 km within the group of OIC countries while the world average is 136.9 km – nearly double that of OIC countries. The poor figures in the OIC countries are mainly caused by the stagnant rail line infrastructure growth coupled with the increasing population. Non-OIC developing countries as a group were also lagging behind the world with an average rail network density of 100 km, which is also far below the average 394.4 km rail network in operation for every 1,000,000 people living in the developed countries (Figure 2.6).

Figure 2.7: Rail Network Density - Rail Length (km) per 1,000 km^2 of Land Area, 2019[1]

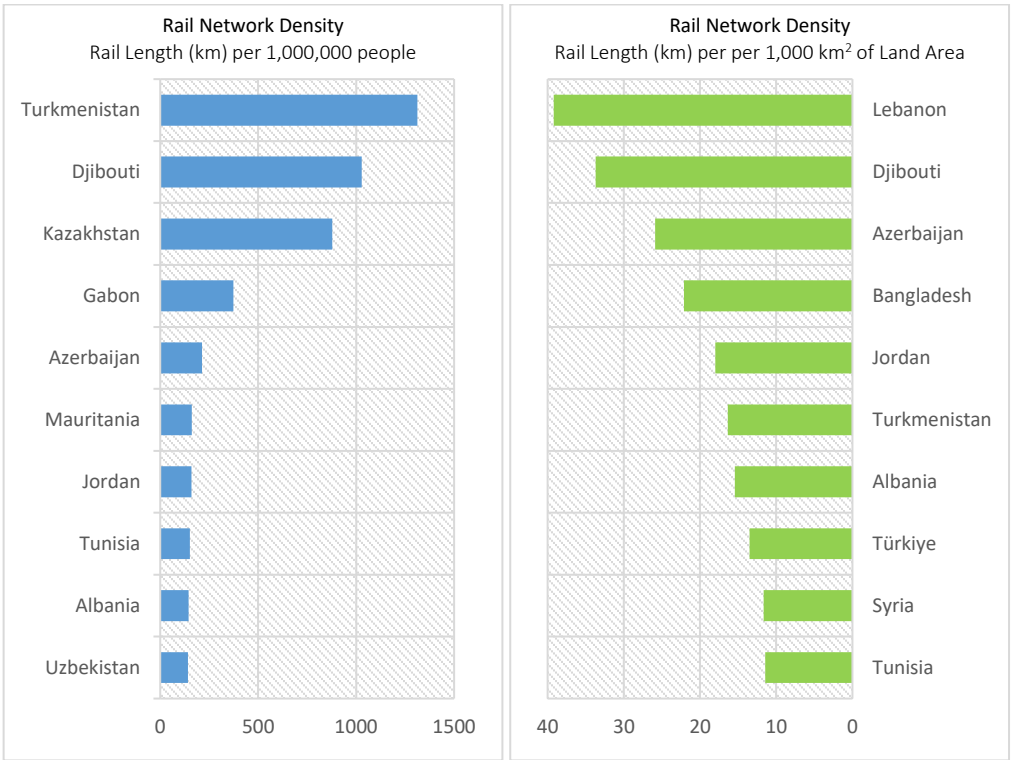


Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2002 and 2019.

Rail network density with respect to land area (measured as the length of railways per 1,000 km^2 land area) is also low in the group of OIC countries. As of 2019, it averages at only 4.6 km, which is only little more than half the world average of 8.3 km and only one-third of the developed countries average of 13.5 km. The OIC countries as a group perform poorly even when compared with non-OIC developing countries, whose average rail network density is 7.2 km (Figure 2.7).

Globally, Turkmenistan ranks 1st in rail network density with respect to population, with 1,313 km of rail for every 1,000,000 people. In addition to Turkmenistan, Djibouti and Kazakhstan were also among the top 10 countries in the world. Concerning rail network density with respect to land area, seven OIC countries, namely Lebanon, Djibouti, Azerbaijan, Bangladesh, Jordan, Turkmenistan, and Albania, have higher values than the group average of developed countries (Figure 2.8). Considering that rail network density with respect to land area shows how well regions in a country are interconnected, the above figures illustrate how vital it is for the OIC countries to further develop their rail networks. This is especially true for landlocked countries, where rail transport can serve as an alternative to sea transportation for developing trade cooperation and tourism sectors.

Figure 2.8: OIC countries with the Highest Level of Rail Network Density, 2019

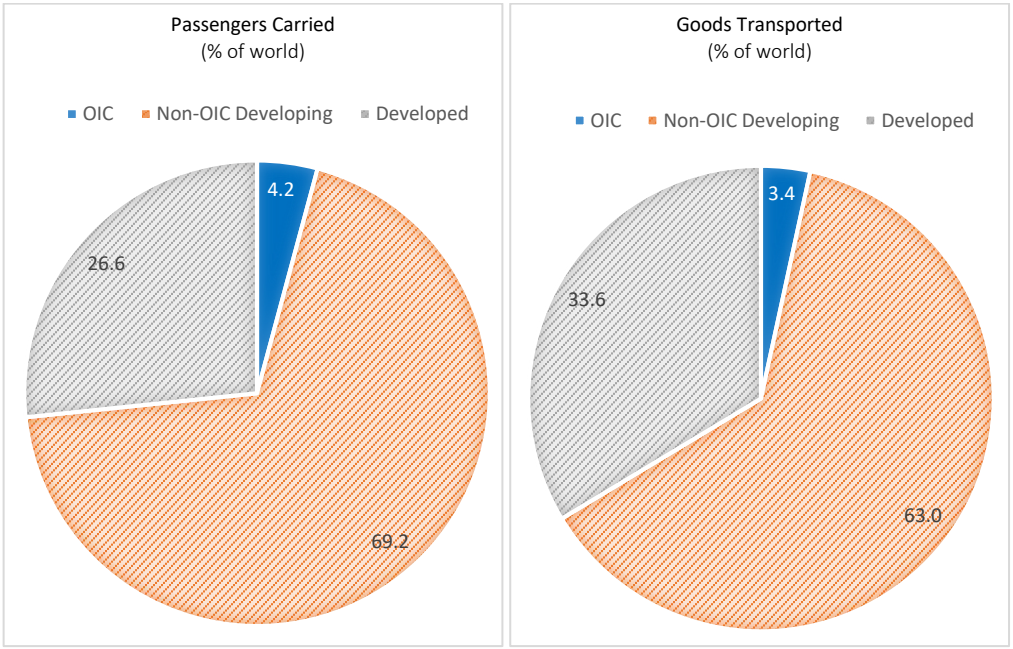


Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

The weak rail network connectivity in the OIC countries translates into a low capacity for transporting people and goods which in turn hinders economic development. As of 2019, the OIC member countries, as a group, account for only 4.2% and 3.4% of the total passengers and goods, respectively, transported through the rail networks in the world. This is a small share of the total

global passengers carried and goods transported by rail. For example, developed countries' global share of passengers carried and goods transported is 26.6% and 33.6%, respectively. Non-OIC developing countries, on the other hand, enjoy the lion's share of passengers carried and goods transported, with a global share of 69.2% and 63%, respectively (Figure 2.9).

Figure 2.9: Rail Network Capacity, 2019

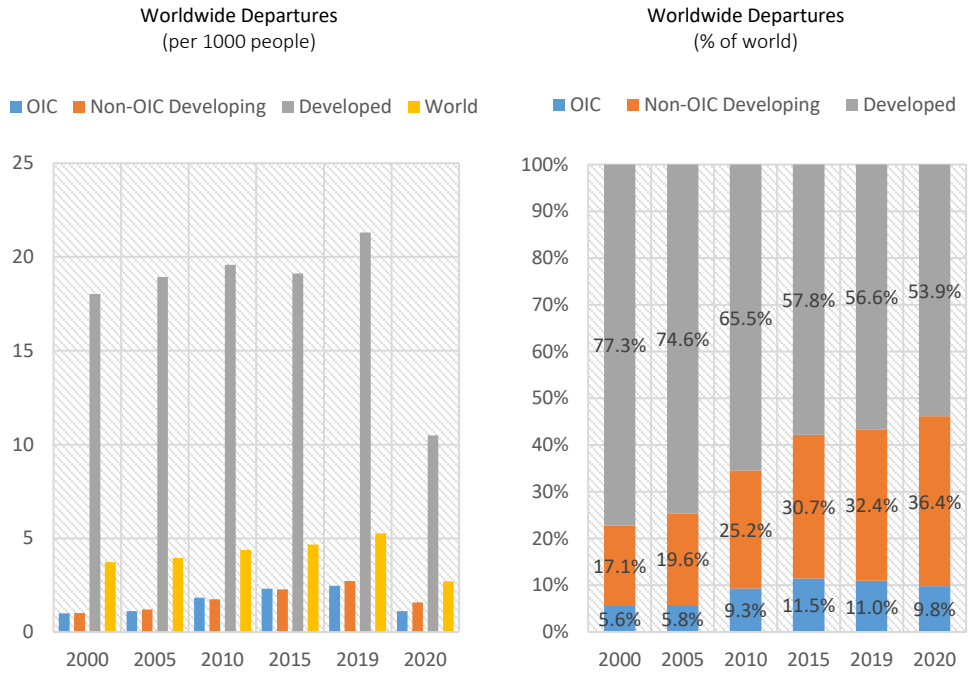


Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

2.3 Air Transportation

Beyond the benefits of fast transcontinental travel, air transport is now a vital mode also for shipping high-value goods that need to come to market quickly, such as agricultural products, medical and health products and others that are subject to spoilage. For this reason, air transport has become an essential economic and social conduit throughout the world. The average number of airline take-offs, measured on a per 1,000-people basis, is still below the desired levels in the OIC countries. According to the SESRIC staff calculations based on the World Bank WDI dataset, air network density – measured by domestic and international take-offs per 1,000 people – by carriers registered in the OIC countries increased from 1 in 2000 to 2.5 in 2019, then dropped to 1.1 in 2020 due to COVID-19 pandemic. This is below what is observed in non-OIC developing countries (1.6), developed countries (10.5) and the world average (2.7). In terms of the distribution of global departures by country, the OIC countries account for only 9.8% of the international take-offs, while non-OIC developing countries have a share of 36.4% and developed countries 53.9% (Figure 2.10).

Figure 2.10: Air Network Density, 2000-2020

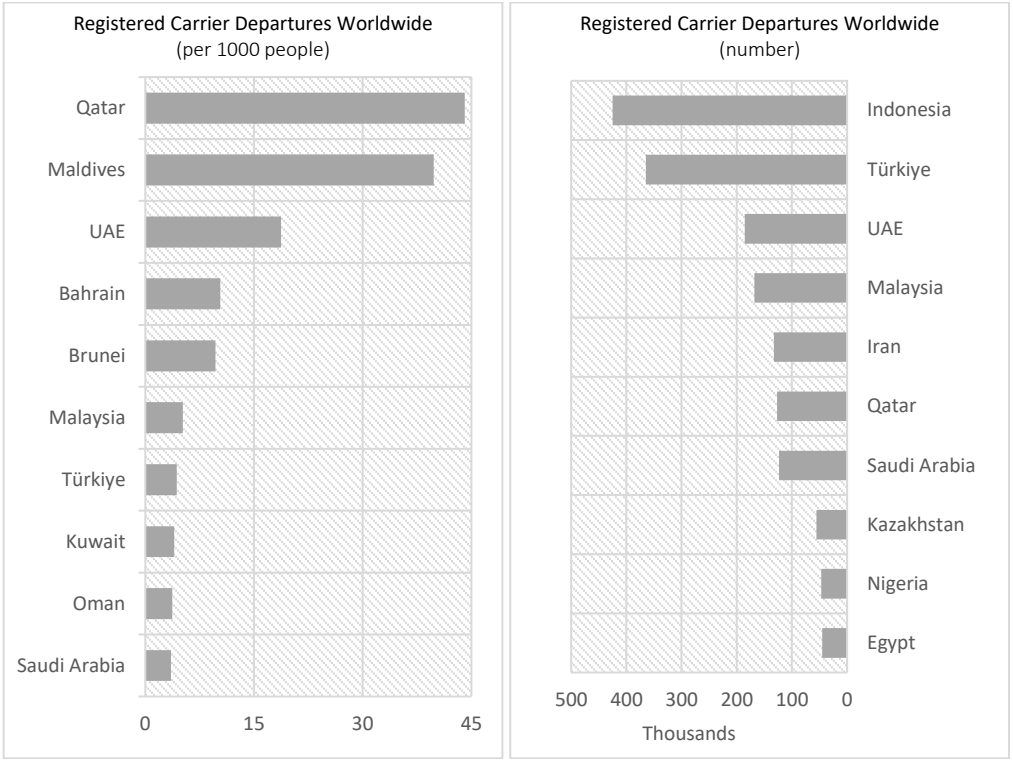


Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

Figure 2.11 shows the top 10 OIC countries according to their air network density levels in terms of the number of registered carrier departures per 1,000 population as of 2020. Qatar (44) and Maldives (40) had the highest level of air network density in OIC countries, and they were among the top ten countries globally. They were followed by the United Arab Emirates, with a registered carrier departures density that is higher than the average of the developed countries. The other seven countries on the list of the top 10 OIC countries failed to register air network density levels on par with developed economies. This points to the fact that even the top OIC countries' performance is relatively weak.

With regard to the total number of registered carrier departures, Indonesia took the lead with 425 thousand departures, followed by Türkiye with 365 thousand departures, and the United Arab Emirates with 185 thousand departures (Figure 2.11). These three OIC countries were among the top 20 countries globally with the highest numbers of registered carrier take-offs. The top 10 OIC countries together accounted for 84% of the total OIC airline take-offs. The low levels of air traffic observed in the OIC countries can be attributed to the lack of infrastructure facilities such as proper terminals and paved runways, which are very low in number and size.

Figure 2.11: OIC Countries with the Highest Air Network Density and Registered Carrier Departures Worldwide, 2020

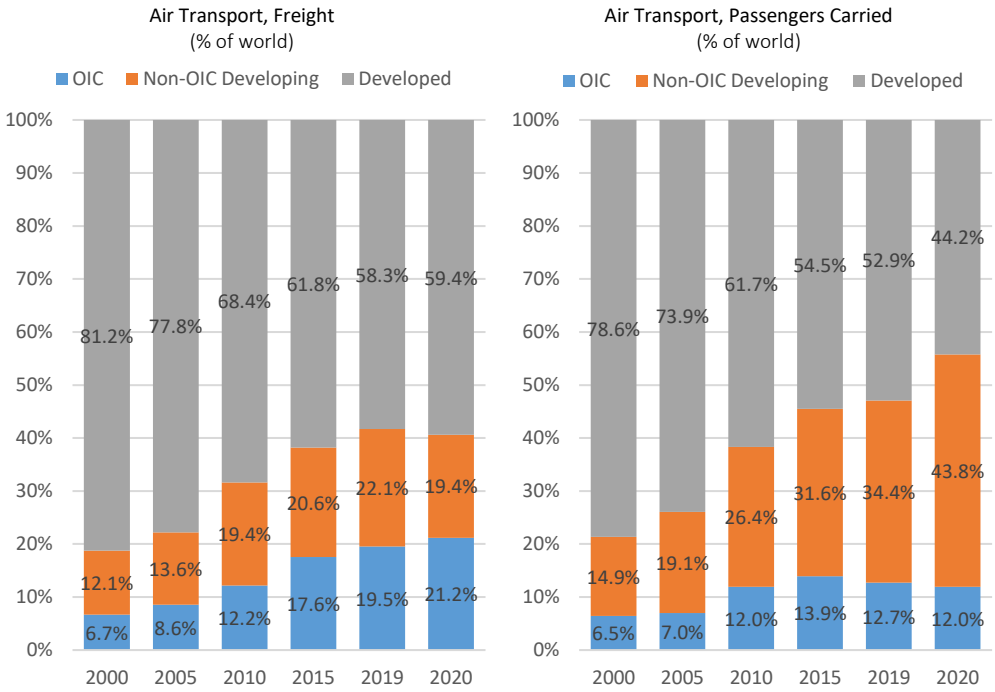


Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

Despite the low air network density of OIC countries as a group, their capacity in transporting people and goods is relatively good. As Figure 2.12 shows, the OIC countries carried 12% of the world's passengers and 21.2% of the global freight in 2020. This is a significant improvement in freight transportation compared with 2010, when OIC countries carried only 12.2% of the global freight, but almost no visible change was achieved in the share of OIC countries in the global passengers travelled.

Indeed, the progress observed in the group of OIC countries is different compared to the improvements recorded in non-OIC developing countries. On the one hand, the OIC countries performed significantly better in increasing the volume of total goods transported than the non-OIC developing countries over the past decade and even throughout the earlier decade. On the other hand, the group of non-OIC developing countries demonstrated better performance in increasing the number of passengers travelled. Overall, developing countries, both OIC and non-OIC, increased their share in global passengers and freight transported by air. Correspondingly, the share of developed countries in passengers carried dropped from 61.7% in 2010 to 44.2% in 2020, while their share of freight transported dropped from 68.4% to 59.4% over the same period.

Figure 2.12: Air Network Capacity, Share in Global Passengers and Freight Transported



Source: SESRIC staff compilation based on data from the World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

Among the OIC countries, Türkiye was the country with the highest number of air passengers carried by the registered carriers in the country in 2020, with 44.7 million people, including both domestic and international passengers. It was followed by Indonesia with 37.5 million passengers, Saudi Arabia with 27 million passengers, the United Arab Emirates with 26.1 million passengers, and Malaysia with 15.9 million passengers. The top 4 OIC countries were among the top 20 globally.

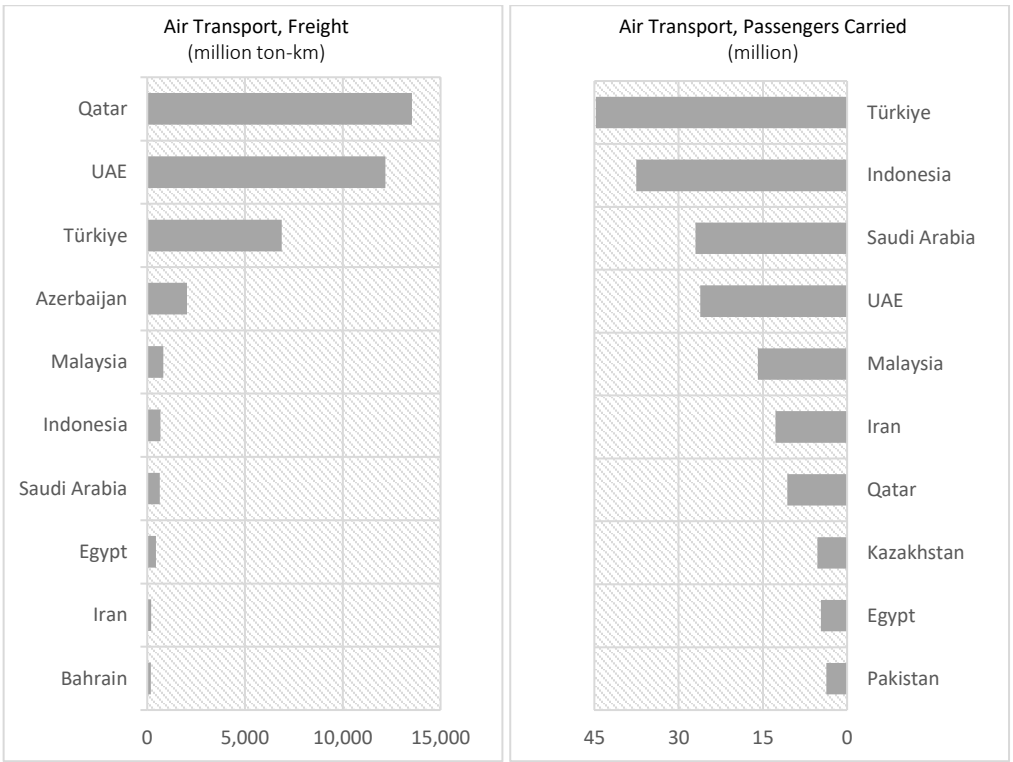
Box 2.*3*: Large Airport Projects Initiated in OIC Countries

The airports listed below are among the largest in the world in terms of total annual passenger capacity, inaugurated since 2010, and have contributed to these OIC countries becoming global and regional air transport hubs.

- Istanbul Airport (Türkiye) opened in 2018, with total annual capacity at 95 million passengers. Target is to increase the annual capacity of handling 200 million passengers in 2028.
- Al Maktoum International Airport (United Arab Emirates) opened in 2010. Target is to increase the annual capacity of handling between 160 and 260 million passengers in 2027.
- Hamad International Airport (Qatar) opened in 2014, with total annual capacity at 50 million passengers. Target is to increase the annual capacity of handling 90 million passengers.

With regard to the total number of passengers – both domestic and international – the United States, China and India were the leading countries in the world due to the large size of their populations and economies. However, when only international passengers are counted, OIC countries took the lead. Indeed, top OIC countries exerted significant efforts to become hubs for air transport. According to Airports Council International (ACI) data, concerning international passengers, Dubai airport and Istanbul airport were the top 2 busiest airports globally receiving 29.1 million and 26.5 million international passengers respectively, in 2021. Doha airport and Antalya airport also were listed in the top 10 globally. Istanbul airport improved its position in the ranking from 14th in 2019 to 6th in 2020 and then to 2nd in 2021. Doha airport jumped from 15th to 7th and 6th over the same period. Antalya airport also climbed up in the ranking from 26th in 2019 to 8th in 2021. Dubai airport headed the list over the whole period in focus.

Figure 2.13: OIC Countries with the Highest Air Network Capacity, Freight and Passengers Carried, 2020



Source: World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

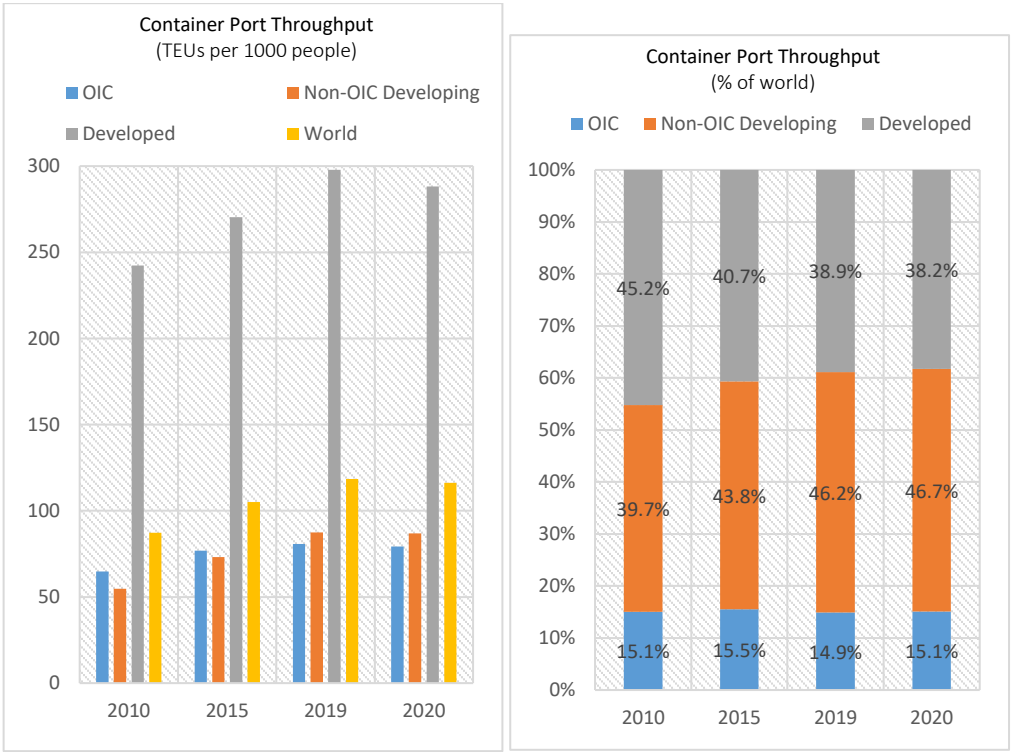
In terms of airfreight transport, the top 4 OIC countries, namely Qatar, United Arab Emirates, Türkiye, and Azerbaijan, were among the top 20 countries globally in 2020. These four OIC countries accounted for more than 90% of the total OIC air cargo transport in 2020 (Figure 2.13).

2.4 Sea Transportation

While all modes of transport are important, sea transport needs special attention given that over 80% of global trade is carried by sea in terms of volume, and thus ports can account for a significant proportion of trade logistics and transport costs (UNCTAD, 2021). With more than 100,000 km of

total coastline, the OIC countries possess significant potential for sea transportation. Yet, the current level of sea transportation network density in the group of OIC member countries is far from enabling the group to fully utilize this potential.

Figure 2.14: Maritime Network Density - Container Port Traffic, 2010-2020



Source: SESRIC staff compilation based on data from the United Nations Conference on Trade and Development Statistics (UNCTADStat) online database, accessed on 13/10/2022.

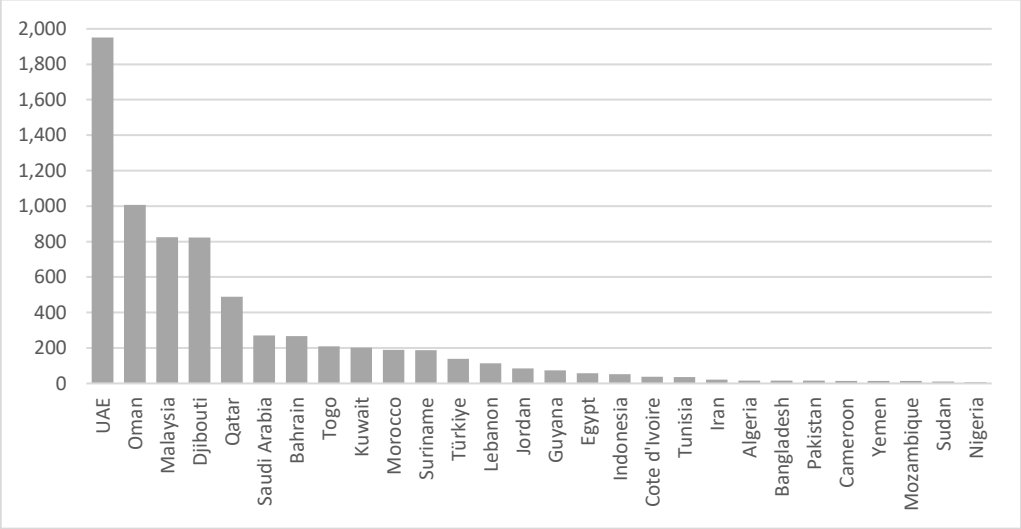
The OIC countries' progress in developing maritime transport networks has been worse than the non-OIC developing countries. In 2010, container port throughput of the non-OIC developing countries was 54.7 TEU per 1,000 people, which was below the OIC countries at 64.7 TEU per 1,000 people. As of 2020, the container port traffic per 1,000 people was measured only at 79.3 TEU in OIC countries, which was below the performance of non-OIC developing countries of 86.8 TEU per 1,000 people and lagged significantly behind the 288.2 TEU per 1,000 people observed in developed countries. Progress of OIC countries was sufficient only to keep their proportional share in the total maritime transportation at around the same level, 15.1% of the world. In comparison, the share of non-OIC developing countries in the global seaport traffic increased from 39.7% in 2010 to 46.7% in 2020. Consequently, the share of the developed countries fell from 45.2% to 38.2%, over the period in consideration (Figure 2.14).

At the individual country level, the top four OIC countries are successfully exploiting their sea transportation potential, demonstrating higher port traffic per 1,000 people than the average of developed countries. On the other hand, several OIC countries with large coastline areas registered very low levels of port traffic per capita (Figure 2.15). In some of these countries, this is the

consequence of political, economic, or military instability that prevents them from tapping into their full potential.

Concerning the total volume of container port throughput, the top five countries including Malaysia, United Arab Emirates, Indonesia, Türkiye, and Saudi Arabia, demonstrated high sea networks, accounting for 68% of the total OIC seaport traffic. Particularly, Malaysia and United Arab Emirates were among the top 10 countries globally.

Figure 2.15: Container Port Throughput (TEUs per 1,000 people) in OIC countries, 2020



Source: SESRIC staff compilation based on data from the United Nations Conference on Trade and Development Statistics (UNCTADStat) online database, accessed on 13/10/2022.

According to the Liner Shipping Connectivity Index (LSCI) (see Box 2.4), the majority of the OIC countries have a low level of integration into global liner shipping networks. Indeed, 36 out of 44 countries with available data for the 3rd quarter of 2022 have an index value ranging between 3.4 and 39.8 (Map 1). Malaysia, with a LSCI score of 98.1, was the top performing country in the OIC and the 4th at the global level after China, South Korea, and Singapore. Malaysia was followed by the United Arab Emirates (75.2), Morocco (71.4), Saudi Arabia (70.9), Egypt (68.1), Türkiye (63.3), Oman (53.5), and Qatar (42.2).

Box 2.4: The Liner Shipping Connectivity Index (LSCI)

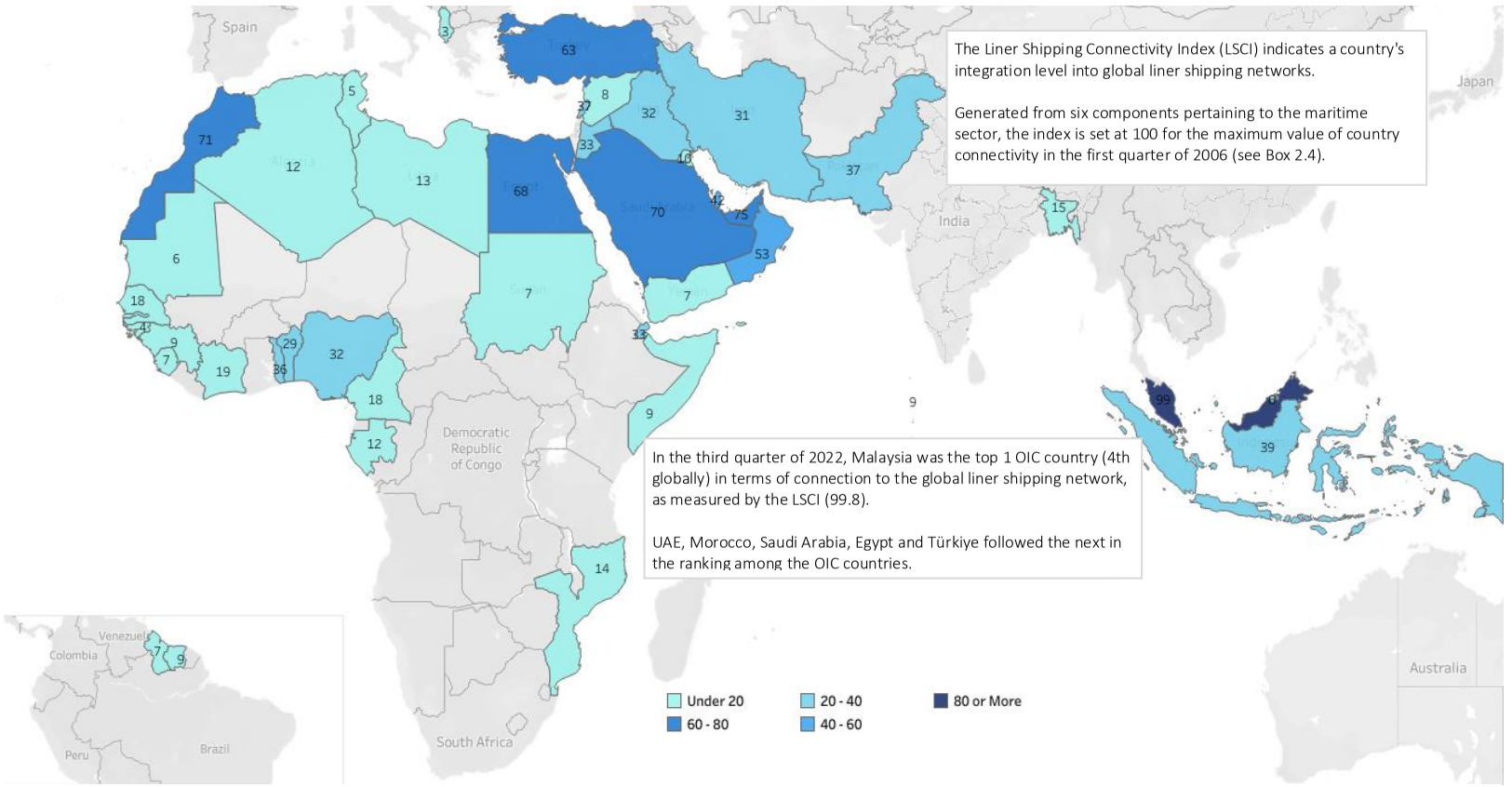
A country's access to world markets depends largely on its transport connectivity, especially in regard to regular shipping services for the import and export of manufactured goods. Indeed, maritime transport is the backbone of international trade and a key engine driving globalization with a number of implications on international trade, travel, and tourism. Calculated and reported quarterly by the UNCTAD, the Liner Shipping Connectivity Index (LSCI) indicates how well countries are connected to global shipping networks based on the status of their maritime transport sector. Countries with improved LSCI scores also tend to have more developed transportation networks including road, rail and air.

Overall LSCI is an index set at 100 for the maximum value of country connectivity in the first quarter (Q1) of 2006. Thus, a high LSCI score implies better connectivity. The UNCTAD updated and improved the LSCI in 2019, with additional country coverage and incorporating one additional component. The current version of the LSCI is generated from the following six components:

a) The number of scheduled ship calls per week in the country;
b) Deployed annual capacity in Twenty-Foot-equivalent Units (TEU): total deployed capacity offered at the country;
c) The number of regular liner shipping services from and to the country;
d) The number of liner shipping companies that provide services from and to the country;
e) The average size in TEU (Twenty-Foot-equivalent Units) of the ships deployed by the scheduled service with the largest average vessel size; and
f) The number of other countries that are connected to the country through direct liner shipping services.

Source: UNCTADstat, Data Center, Liner Shipping Connectivity Index. https://unctadstat.unctad.org/
World Bank, DataBank: Glossary, Liner Shipping Connectivity Index. https://databank.worldbank.org/

Map 1: Liner Shipping Connectivity Index of the OIC countries in the 3rd Quarter of 2022



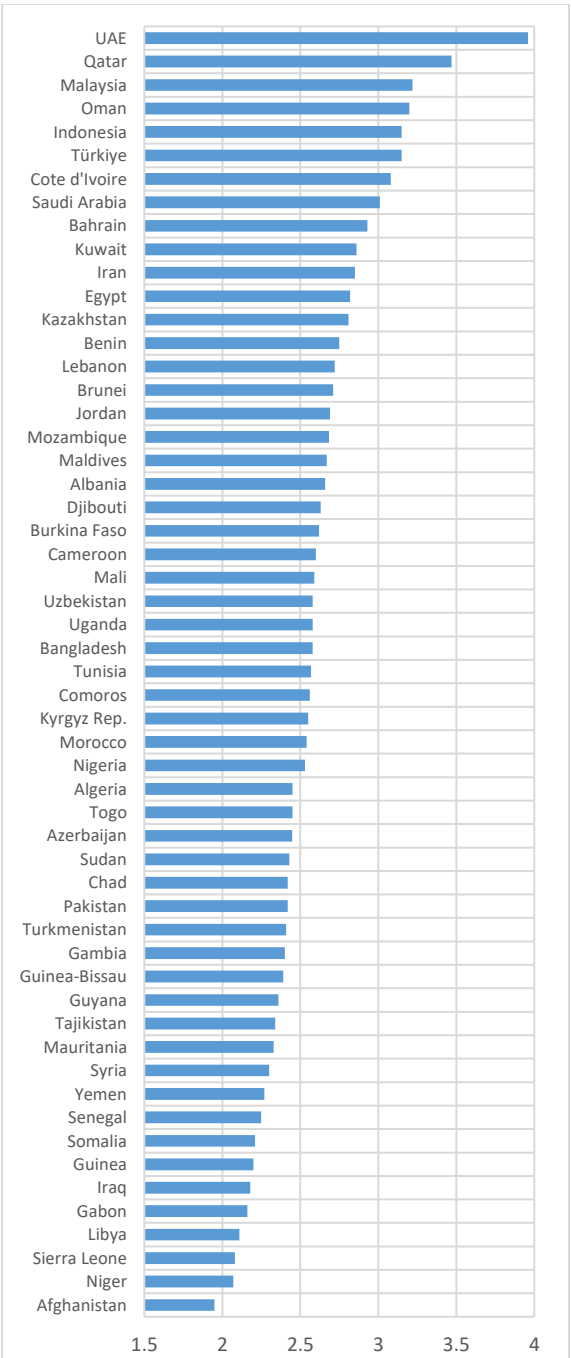
Source: The map was prepared by SESRIC Staff based on the data accessed from the United Nations Conference on Trade and Development Statistics (UNCTADStat) online database on 13/10/2022 and using Tableau Public Software.

2.5 Logistical Performance and Quality and Efficiency of Infrastructure

The poor transport network densities and capacities in the OIC countries, highlighted in the above discussions, translate into incompetency in logistics, which is the backbone of trade. This situation could be evaluated by means of the Logistics Performance Index (LPI) of the World Bank (see Box 2.5).

As of 2018, the global average LPI value was 2.87, the average of OECD countries was 3.58, and the high-income countries average was 3.48. Considering the performance of the OIC countries (see Figure 2.16), only nine of them had an index value that was higher than the global average. The United Arab Emirates was the top performer among the OIC countries, with a score of 3.96 and ranked 11th in the world. Qatar came next ranked only 29th globally with an LPI value of 3.47, followed by Malaysia (3.22), Oman (3.20), Indonesia (3.15), Türkiye (3.15), Cote d'Ivoire (3.08), Saudi Arabia (3.01), and Bahrain (2.93). Although an improvement in logistics is required over time to provide better opportunities for trade and tourism, only half (28) of the OIC countries achieved improvement in LPI score between 2016 and 2018.

Figure 2.16: Logistics Performance Index: Overall (1=low to 5=high), 2018



Source: World Development Indicators (WDI) online database of the World Bank (WB) accessed on 13/10/2022.

Box 2.5: The Logistics Performance Index (LPI)

The LPI is an interactive benchmarking tool created by the World Bank to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. Last measured for the year 2018, it allows for comparisons across 160 countries.

The LPI is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries where they trade and experience of global logistics environment. Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work.

The LPI consists, therefore, of both qualitative and quantitative measures and helps build profiles of logistics friendliness for these countries. It measures performance along the logistics supply chain within a country and offers two different perspectives: international and domestic. The International LPI, which includes a country ranking, provides qualitative evaluations of a country in six areas by its trading partners—logistics professionals working outside the country. These areas are:

- The efficiency of customs and border management clearance ("Customs").
- The quality of trade and transport infrastructure ("Infrastructure").
- The ease of arranging competitively priced shipments ("Ease of arranging shipments").
- The competence and quality of logistics services—trucking, forwarding, and customs brokerage ("Quality of logistics services").
- The ability to track and trace consignments ("Tracking and tracing").
- The frequency with which shipments reach consignees within scheduled or expected delivery times ("Timeliness").

The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons. Thus, the index ranges on a scale of 1 to 5, with a higher score representing better performance.

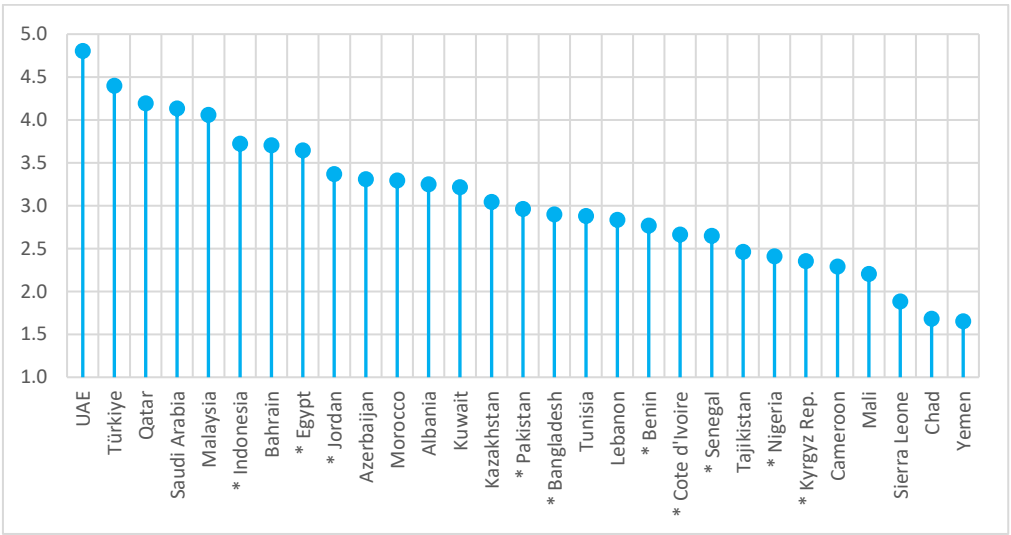
Source: https://lpi.worldbank.org/.

The density or total capacity of air, rail, road and seaport infrastructure are not the only areas that need improvement in the OIC countries; the quality and efficiency of infrastructure also require close attention. The infrastructure subindex of the Travel & Tourism Development Index (TTDI)[2] could be a valuable reference at this point as it captures not only the availability but also the quality

[2] The World Economic Forum developed and published the Travel & Tourism Development Index (TTDI) in May 2022 based on its previous works on Travel & Tourism Competitiveness Index (TTCI).

of physical infrastructure in countries. It includes three pillars: air transport infrastructure, ground and port infrastructure, and tourism services infrastructure. Each pillar is estimated by a number of relevant indicators; for example, the air transport infrastructure pillar is measured using indicators such as available seat kilometres, the number of operating airlines, and the efficiency of air transport services as well as the extent to which a country's airports are integrated into the global air transport network. For the infrastructure subindex, a score of one is the lowest score indicating that the quality and efficiency of infrastructure are among the worst in the world, while the highest score of seven indicates that the quality of infrastructure is among the best in the world.

Figure 2.17: Infrastructure Subindex of the TTDI, (1=low to 7=high), 2021



Source: World Economic Forum. The Travel & Tourism Development Index 2021 dataset (version 24 May 2022).
Note: (*) Improved their score over 2019-2021.

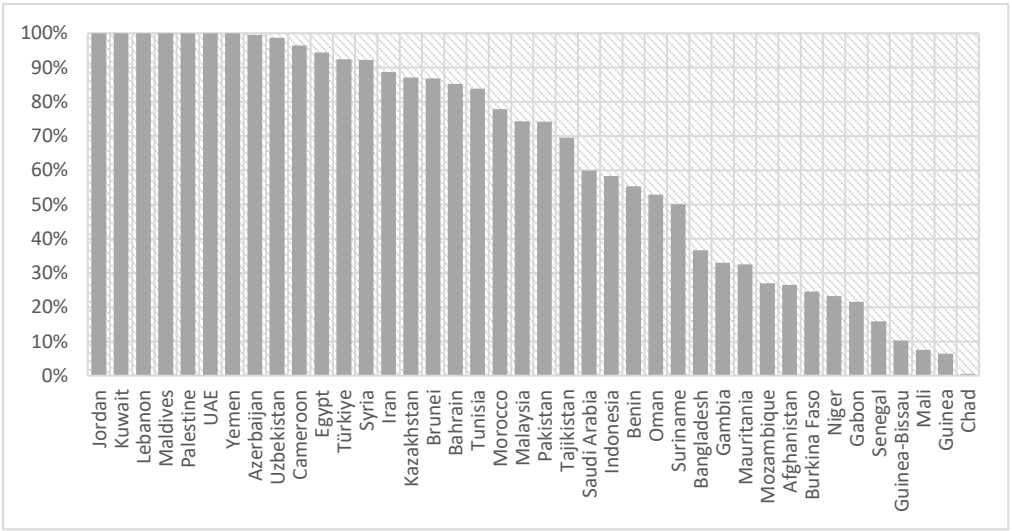
At the global level, the top ranking 26 countries in the infrastructure subindex of TTDI in 2021 were all high-income economies. Only one OIC country, the United Arab Emirates, was among them, at 16th place, with an index value of 4.8. Switzerland was the global leader, with 5.6, followed by Spain with 5.5 and Japan with 5.5. Figure 2.17 presents the index values for the OIC countries captured by the index. It is observed that Türkiye, Qatar, Saudi Arabia, and Malaysia came after the United Arab Emirates and were ranked 29th, 35th, 37th and 38th globally with index values of 4.4, 4.2, 4.1, and 4.1, respectively. Compared to 2019, two-third (19) of the 29 OIC countries covered in the index had a lower score in 2021, signalling a deterioration in the quality and efficiency of their infrastructure, which could largely be attributed to the COVID-19 pandemic.

For the road infrastructure, the proportion of paved roads in a road network is an important indicator of road quality in any country. Paved roads are roads that have been covered with a continuous layer of hardened material, usually asphalt or concrete, to create a smoother, more durable driving surface. The pavement helps reduce noise, provides a better riding surface and improves safety. Paved roads are generally found in more urban and suburban areas, while dirt and gravel roads are more common in rural areas. Paved roads are designed to retain their smooth surface over a longer period of time and require less maintenance than unpaved roads. They

benefit society in a variety of ways, including increased safety, convenience, and economic development. They also aid in the reduction of pollution and the facilitation of the transportation of goods and services, both of which are critical for driving economic growth.

Available data show that there are significant differences among the OIC countries in terms of the share of paved roads in total road network. Some member countries, such as Chad, Guinea, Mali, Guinea-Bissau, and Senegal, have under 20% of their road network paved. In some others, over 95% of the road network is paved (Figure 2.18).

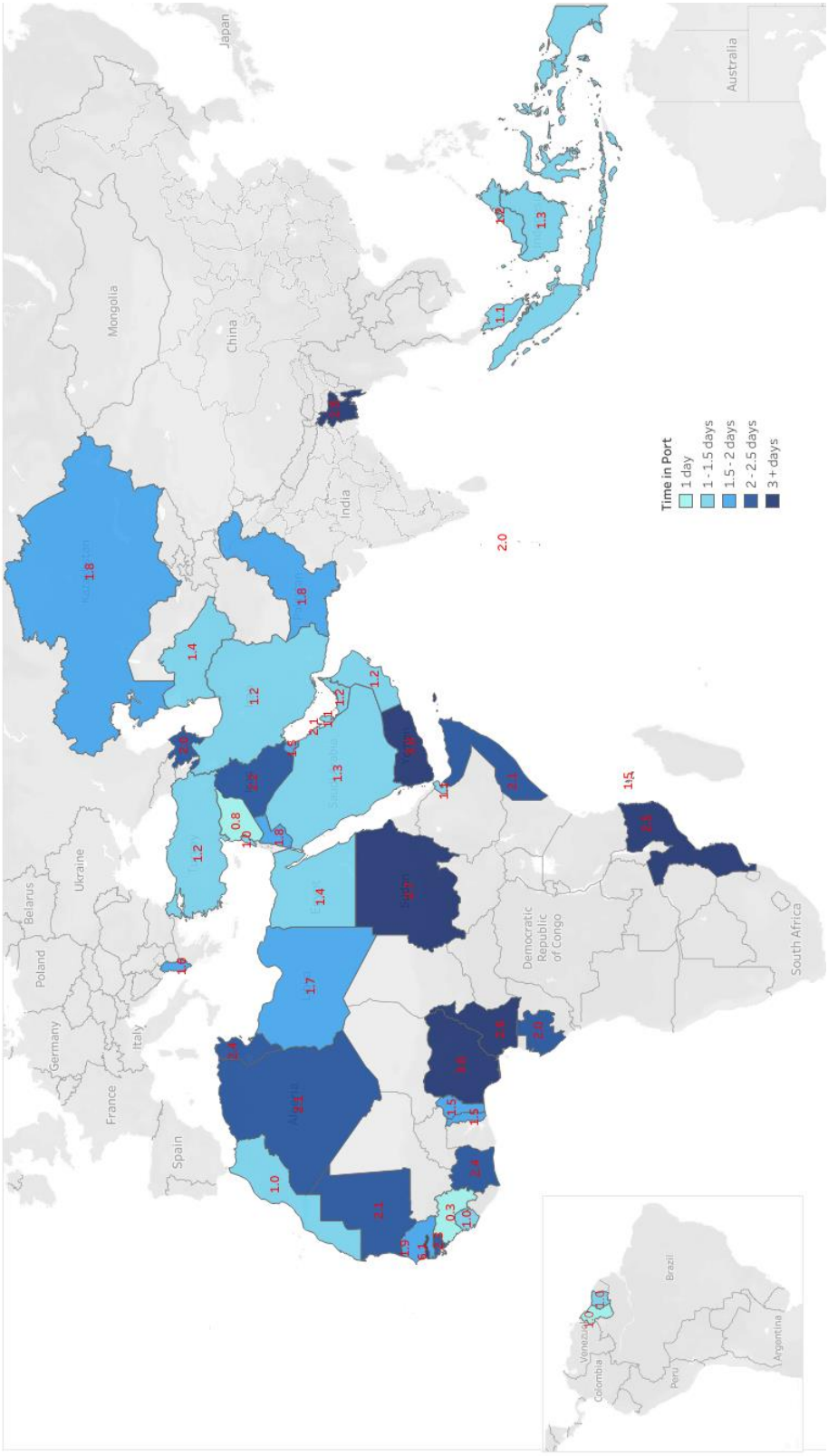
Figure 2.18: Paved Roads, Share in Total Road Network, 2020[1]



Source: World Road Statistics (WRS) Datawarehouse of the International Road Federation (IRF) accessed on 13/10/2022.
Note: (1) Based on the latest year with available data between 2015 and 2020.

With regard to seaport performance, we can analyse several key indicators such as average time spent in port, the number of port calls, port throughput, and port efficiency. These indicators can provide a better understanding of port operations, including the amount of time vessels spend in port, the amount of cargo handled, and the efficiency of port operations. Additionally, analysing port traffic can enable us to identify busy routes and the number of ships visiting various ports. This data can then be used to inform decisions about port operations, such as directing more resources to high traffic.

Map 2: Port Performance: Median Time Spent in Ports (days), 2022



Source: The map was prepared by SESRIC Staff based on the data accessed from the United Nations Conference on Trade and Development Statistics (UNCTADStat) online database on 13/10/2022 and using Tableau Public Software.

Available data shows that, on average, all types of ships departed from the ports of Guinea, Syria, and Guyana in less than a day after their arrival. Across the next 18 OIC countries, the median time spent in ports on average for all types of ships ranged from 1 day to 1.5 days. In another 10 countries, it was between 1.5 to 2 days. In 14 OIC countries, it was from 2 to 3 days. The worst performers were Gambia with 6.1 days, Yemen with 3.8 days, and Nigeria with 3.6 days (Map 2).

Table 2.1: Number of Port Calls, Annual, All Ships, 2021

Türkiye	204,553	Bangladesh	3,065	Djibouti	1,179
Indonesia	181,658	Azerbaijan	2,867	Benin	1,102
Malaysia	35,897	Lebanon	2,733	Yemen	1,033
UAE	25,836	Guinea	2,605	Kazakhstan	905
Morocco	18,061	Albania	2,541	Mauritania	849
Saudi Arabia	15,364	Iraq	2,464	Suriname	676
Egypt	12,645	Turkmenistan	2,331	Somalia	652
Iran	6,887	Cote d'Ivoire	2,121	Gabon	499
Algeria	6,584	Mozambique	1,981	Brunei	481
Oman	6,097	Senegal	1,972	Sierra Leone	451
Qatar	5,229	Bahrain	1,697	Syria	331
Nigeria	4,102	Jordan	1,561	Maldives	327
Libya	3,966	Togo	1,524	Gambia	173
Pakistan	3,792	Guyana	1,348	Comoros	122
Tunisia	3,625	Cameroon	1,295	Guinea-Bissau	70
Kuwait	3,225	Sudan	1,269		

Source: United Nations Conference on Trade and Development Statistics (UNCTADStat) online database accessed on 13/10/2022.

Proficient sea cargo shipment is contingent on effective trade and transport facilitation that reduces the time and cost of customs and other trade procedures and integrates new technologies for administrative formalities (UNCTAD, 2021). Türkiye had the highest number of port calls among the OIC countries, with 204.6 thousand calls, followed by Indonesia with 181.7 thousand calls. These two OIC countries were the 7th and 8th countries globally in terms of the annual number of port calls in 2021. They accounted for 65% of the total port calls received by the OIC countries (Table 2.1).

2.6 Final Remarks and Policy Implications

The analysis in this chapter makes it obvious that there is a strong need for the accomplishments of further development in the transportation sector. Despite the budgetary constraints, the transportation sector receives great attention in most OIC countries, though the OIC countries, on average terms, lag behind not only the developed countries and the global average, but also the non-OIC developing countries. Unfortunately, it holds true for all modes of transportation. In maritime transportation, the OIC countries used to perform relatively better thanks to the top performing countries, but the progress over the last decade was not sufficient. Despite having large coastline, many OIC countries are lacking to exploit their maritime potential.

The OIC countries face critical obstacles and challenges in the field of transportation, which hinder their economic development. Already inadequate infrastructure and maintenance services cannot be improved considerably due to insufficient financing resources and investment in the

transportation sector and transportation infrastructure projects. Complex and prolonged customs and border-crossing procedures, especially in land-locked member countries, prevent the development of transportation.

Another challenge faced by the OIC countries is the slow implementation of transportation and trade facilitation measures and the lack of information and knowledge-sharing among OIC member countries in this area. Lack of a sound, harmonized, and adequate legal and regulatory frameworks, both at national and OIC regional level further exacerbates this challenge. Transportation authorities in the OIC countries lack the adequate human and institutional capacity. The use of Information and Communication Technologies (ICT) in the area of transport is also lagging.

The above-identified obstacles and challenges have implications at both national and OIC cooperation level. At the national level, the solution of infrastructure problems requires sustainable longer-term investment and involvement of the private sector in transport projects. Measures should be developed to improve maintenance of existing roads, railways, seaports and airports as well as to improve the quality of these transport modes services. Sufficient resources should be allocated to the projects, programs and studies in the transport sector, in collaboration with regional and international financial institutions. More attention from private investors should be attracted through rational incentives. Private investments via Public-Private Partnership (P-PP) scheme have become popular around the world as a tool for improving transport infrastructure.

Transport sector reform has to be set in the context of general reform of public institutions, and transport development plans should be integrated into their national strategies taking into consideration regional initiatives. National Trade and Transport Facilitation Committees (NTTFC) can be established for better coordination among private and public sectors institutions. This can help to identify the major transport-related obstacles in the member countries. Such mechanisms should be further improved by developing tools for knowledge-sharing on best practices and using ICT.

At the OIC cooperation level, developing an OIC regional transport approach requires close cooperation and coordination between the member countries as well as the different organizations and agencies involved. It also requires concluding of framework agreements on the priorities both in the infrastructure and policy areas. High-level policy coordination among Ministers of Transport in member countries can help promote dialogue on the challenges and problems facing the sector in the OIC region. This could also help tailoring the potential solutions to poor transport development to the challenges faced by each individual country, considering the significant variations in the spatial distribution of population, the intensity of economic activities and the level of economic development among the member countries.

Exchanging of information among OIC member countries about their domestic transport facilities can help improve the transport networks throughout the OIC. Enhancing partnership with relevant regional and international organizations in the field of transport to enhance effectiveness is also needed. In this framework, a master plan for the transport corridors in the OIC member states, including identification of the obstacles on the existing transport corridors in the OIC sub-regions, should be prepared.

The OIC countries are too widely dispersed geographically to be grouped together as a single territory, but their histories, cultures, and commitment to Islam bind them together. In this regard, developing better transport connectivity can help to realise their true potential for cooperation and integration. Therefore, the OIC countries are promoting global and regional initiatives in the area, for example, the Belt and Road Initiative (BRI) is seen as in line with the OIC countries' objectives of promoting socio-economic development. The OIC has been particularly supportive about the projects in landlocked African and Asian member states, where better inland transport connectivity means to promote intra-African and intra-Asian trade and tourism, to be discussed more thoroughly in the following chapters. For instance, the OIC member states support transportation initiatives like Türkiye's "Middle Corridor" and Kazakhstan's "Bright Path" even if they are considered to be components of the grander BRI. These initiatives can be customised to increase prospects for cooperation among the OIC member states.

3. Impacts of Transport Connectivity on Trade

It is often argued that technological improvements in ocean shipping during the 19th century was one of the most critical factor in increasing trade flows across the globe and leading to globalization. Fall in transportation costs continued to be a key in determining the pace of global flows of goods and services in the 20th and 21st centuries. Developments in air transportation and communication technologies further contributed to connecting people across regions. It is estimated that, from 1800 to 2007, world exports grew at an impressive 4.2% annual rate, corresponding to a cumulated 6437-fold increase (Federico and Tena-Junguito, 2016).

The critical role that a better transport infrastructure plays in expanding trade flows is well recognized. Improved capacity and better connectivity within and across borders boosts trade, fosters growth, and generates prosperity. However, there are vast discrepancies in the quality of transport infrastructure across countries and regions. This has implications on the volume and structure of trade as well as economic growth and development. Improving inland transport infrastructure and transport corridors is a very costly long-term investment, but it pays off if well designed and managed. Together with well-functioning trade logistics, transport development can be said to be at the hearth of inclusive growth and economic development.

Better transport infrastructure is also critical in increasing investments, productivity, and competitiveness. There are studies showing that foreign direct investment is more likely to flow to areas where transportation systems are more efficient. Infrastructure development needs for the four modes of transportation (air, land, sea, and rail) vary across countries depending on the geographical and other factors affecting the mobility of goods and people. Every country needs to identify the most optimum transport corridors for their products and services to reach the global markets and then make necessary investments to ensure that these corridors function well and remain reliable.

In this regard, this section reviews the importance of transportation connectivity and its impacts on trade. It starts with highlighting the importance of transportation and logistics for trade and continues with the analysis on the transport costs, logistics performance and their impacts on trade flows with special reference to the OIC countries. It concludes with some policy recommendations.

3.1 Importance of Transport Networks and Corridors in Trade

Transport corridors are routes that facilitate the movement of people and goods across regions. Common objectives of corridor projects include improving infrastructure connectivity, facilitating the efficient movement of freight, and promoting economic growth by improving the competitiveness of exports and reducing the costs of imports or developing clusters of economic activity along the corridor supported by efficient logistics (World Bank, 2014). Regional corridors

are particularly important to landlocked countries, where they often provide the only overland routes to international markets.

A transport corridor is a composite system with several components, including infrastructure, transport and logistics services and regulations. Interest in exploiting the corridor approach to trade and transport facilitation has increased significantly in recent years. All regions of the world, developed and developing, have several trade and transport corridor initiatives. Considering the wider economic benefits of transport corridors, multilateral development institutions, including the World Bank and the Islamic Development Bank, have provided support in developing countries for building infrastructure and strengthening institutional and legal frameworks to improve corridor performance. The OIC countries, due to their wide geographical distribution, have been part of major international trade and transport corridors. Table 3.1 provides the overland corridor initiatives involving at least one OIC country.

Table 3.1: Major International Transport Corridors Involving OIC Countries

	Corridor	Coastal Countries	Landlocked Countries
Africa	[Eastern Africa] Djibouti Corridor, LAPSSET Corridor, Northern Corridor, Central Corridor	**Djibouti**, Eritrea, Kenya, **Somalia**, **Sudan**, Tanzania	Burundi, Ethiopia, Rwanda, South Sudan, **Uganda**
	[Southern Africa] Nacala Corridor, Beira Corridor, Maputo Corridor, Durban Corridor, Dar Es Salaam Corridor, North-South Corridor	Congo DR, **Mozambique**, South Africa, Tanzania	Botswana, Eswatini, Lesotho, Malawi, Zambia, Zimbabwe
	[Central Africa] Ponte Noire-Bangui Corridor Douala-Bangui Douala-N'djamena Corridor	**Cameroon**, Congo DR, Republic of Congo	Central African Republic, **Chad**
	[West Africa] Lagos-Abidjan Corridor, Lomé-Ouagadougou-Niamey Corridor, Tema-Ougadougou-Bamako Corridor, Cotonou-Niamey Corridor, Abidjan-Ouagadougou-Niamey-Bamako Corridor	**Benin, Cote d'Ivoire, Gambia**, Ghana, **Guinea**, **Guinea Bissau**, Liberia, **Nigeria, Sierra Leone, Togo**	**Burkina Faso, Niger**
	[West Africa] Dakar-Bamako- Niamey Corridor	**Mauritania, Senegal**	**Burkina Faso, Mali, Niger**
	[North & West Africa] Trans-Saharan Road Corridor	**Algeria, Nigeria, Tunisia**	**Chad, Mali, Niger**
Asia	SASEC land transport corridors	**Bangladesh**, India, Myanmar, Sri Lanka	Bhutan, Nepal
Intercontinental	Transport Corridor Europe-Caucasus-Asia (TRACECA)	Bulgaria, Georgia Moldova, Romania, **Turkey**, Ukraine	**Afghanistan, Azerbaijan**, Armenia, **Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan**
	CAREC Corridors: 1: Europe–East Asia 2: Europe-Mediterranean–East Asia 3: Russian Federation–Middle East and South Asia 4: Russian Federation–East Asia 5: East Asia–Middle East and South Asia 6: Europe–Middle East and South Asia	China, **Pakistan**, Russia	**Afghanistan, Azerbaijan**, Georgia, **Kazakhstan, Kyrgyzstan,** Mongolia, **Tajikistan, Turkmenistan** and **Uzbekistan**
	International North–South Transport Corridor	India, **Iran**, Russia	**Afghanistan**, Armenia, **Azerbaijan**
	Belt and Road Initiative Land Corridors: New Eurasian Land Bridge Economic Corridor China-Mongolia-Russia Economic Corridor China-Central Asia-West Asia Economic Corridor China-Indochina Peninsula Economic Corridor Bangladesh-China-India-Myanmar Economic Corridor China-Pakistan Economic Corridor	**Bangladesh**, Cambodia, China, Greece, India, **Iran**, **Malaysia**, Myanmar, **Pakistan**, Russia, Thailand, **Turkey**, Vietnam	**Afghanistan, Azerbaijan**, Georgia, **Kazakhstan, Kyrgyzstan,** Lao PDR, **Tajikistan, Turkmenistan, Uzbekistan**

Source: UN-OHRLLS (2020) and SESRIC staff compilations.

Due to its comprehensive multi-sectoral nature, corridor investment should not be regarded as only a transport infrastructure investment. It is also about supporting economic inclusion, promoting industrial development, facilitating trade, and alleviating poverty, amongst other dimensions. A corridor investment requires infrastructure development in transportation, energy, communication, logistics and trade, which are all critical foundations of economic activities. It further supports the development and implementation of national and regional growth strategies. It also strengthens the interlinkages between hard infrastructure, soft infrastructure, industrial development and social sector development. Therefore, corridor development can be an important instrument in fostering regional integration and economic partnership, and it help countries to achieve to transform their economies based on their intrinsic development potentials.

In this connection, improving transport infrastructure is seen as an important policy objective in achieving greater economic integration, economic growth and prosperity. It usually requires huge resources to improve transport and logistics infrastructure, including paved roads, railways, ports, containers, terminals and vehicles, but it is indispensable for developing countries to have a high quality transport infrastructure to compete in global markets. Empirically, gravity-based estimates show that the marginal effect of physical infrastructure remains positive, large and significant at all levels of developments (Moïse and le Bris, 2013). It is also shown that improvements on physical infrastructure bring the greatest benefits in terms of export performance (Portugal-Perez and Wilson, 2012). Therefore, building high-quality transport network should be a high priority.

Road infrastructure is of crucial importance for intra-continental trade and particularly for landlocked countries. In some cases, inland transport infrastructure may be well developed, but landlocked countries will continue to rely on the infrastructure of the transit countries to carry export commodities. It is estimated that ambitious investments in road quality within the Eastern Europe and Central Asia region could raise regional trade by as much as 50% (Shepherd and Wilson, 2006). This highlights large potential spillover effects and the importance of a regionally integrated transport policy. Similarly, it is found that transit delays, due to poor road quality and insecurity, are even a stronger barrier to Africa's exports than documentation and customs handling delays, where a one-day increase in inland transit reduces the value of African exports by 7% (Freund and Rocha, 2010)

The maritime sector offers the most economical and reliable mode of transportation over long distances, especially for African countries that are not yet specialized in high-value products. Poorly performing ports are likely to reduce trade volumes, particularly for small low-income countries (UNCTAD, 2021). Improvement in maritime transport infrastructure therefore brings important benefits. It is found that a one-day decrease in time spent at sea could increase trade by about 4.5%, and a 10% increase in maritime transport costs is associated with a 6 to 8% decrease in trade (Korinek and Sourdin, 2011). The quality of port infrastructure and maritime transport are also critical for facilitating international trade, where a 10% rise in port efficiency increases trade between a country-pair by 3.2% (Blonigen and Wilson, 2008).

Maritime transport costs may have a significant impact on the trade in agricultural goods. Korinek and Sourdin (2009) finds that a doubling of bilateral transport costs is associated with a 42% decline, on average, in the value of bilateral country-pair agricultural imports overall. This strong

effect implies that producers and exporters in countries with high transport costs suffer significantly in terms of competitiveness and the amount of goods they trade. This increases the tendency to source imports from countries with low transport costs (Korinek and Sourdin, 2009).

A significant share of transport costs occurs due to lack of efficient and competitive logistics services, such as cargo handling and storage. Some even argue that inefficient logistics services are a greater constraint to Sub-Saharan African (SSA) trade than physical infrastructure. Particularly due to high transport costs and inefficient logistics services, intra-regional trade of food and agriculture products in SSA faces enormous challenges (World Bank, 2012). Therefore, high-quality transportation services are essential for low-income and landlocked countries to attain fundamental development objectives, such as food security and poverty alleviation.

The importance of air travel and air connectivity in increasing levels of trade is again well established. Air cargo is a faster and more efficient way of transporting goods, particularly those that are of higher value, lower weight or time sensitive. Air connectivity is exceptionally effective at reducing the perceived distance between markets as well as the time to reach some markets. During the COVID-19 pandemic, air cargo remained rather resilient and effective in facilitating the access of countries to critical personal protective equipment. Air transport is also critical in facilitating the mobility of people. In relation to the trade in goods, companies need staff to travel to meet potential customers, to secure deals and to provide after sales care. In relation to the trade in services, companies may additionally need individuals to travel to actually deliver the services being sold (Oxford Economics, 2013). Overall, even though it is very costly to build efficient transport infrastructure and logistics services, the potential benefits and spillovers are likely to be high for developing countries, including OIC countries.

3.2 Role of Transport Costs in Trade

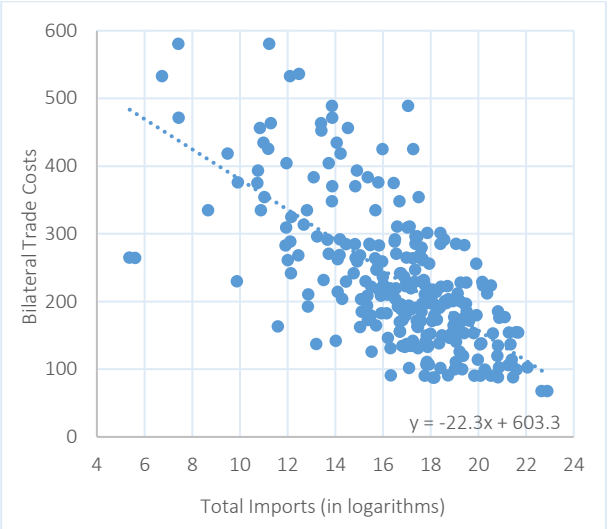
To move products to market efficiently and reliably, there is a need to improve transport infrastructure and reduce trade costs. It is estimated that around one quarter of world trade (by value) occurred between countries that share a land border over the last decades (Hummels, 2007). This is particularly strong in the case of European and North American countries with a share of 25-35%, compared to 1-5% in Africa and Middle East. Trade among countries without land borders occurs mainly through sea or air transportation, depending on the type of commodity. Bulk commodities like oil and petroleum products, coal, and grains are shipped almost exclusively via vessels.

According to UNCTAD (2021), around 80% of global trade by volume and over 70% of global trade by value are carried by sea and are handled by ports worldwide. These shares are even higher in the case of most developing countries. However, trade and transport costs pose significant challenges in improving trade relations among countries. For example, Figure 3.1 shows that

bilateral export volumes among the OIC countries are highly influenced by trade costs (indicated in ad valorem terms). Country pairs with high trade costs tend to have lower bilateral export volumes.

Considering the critical importance of trade costs, this section focuses on the major determinants of trade costs and transport costs, with particular reference to OIC countries.

Figure 3.1: Bilateral Trade Costs and Import Values in OIC Countries (2020)



Source: SESRIC staff compilation based on WB-UNESCAP Trade Costs and IMF DOT Databases.

Determinants of Trade and Transport Costs

Trade costs broadly include all costs incurred in getting a good to a final user other than the marginal cost of producing the good itself: transportation costs (both freight costs and time costs), policy barriers (tariffs and nontariff barriers), information costs, contract enforcement costs, costs associated with the use of different currencies, legal and regulatory costs, and local distribution costs (wholesale and retail) (Anderson and van Wincoop, 2004). Therefore, in an increasingly globalized and interconnected world, trade costs matter as a determinant of the pattern of bilateral trade and investment, as well as of the geographical distribution of production and they are an important determinant of a country's ability to take part in regional and global production networks (Arvis et al., 2013).

Since the initiation of the General Agreement on Trade and Tariffs in 1947, a dramatic fall in tariffs, quotas and other non-tariff barriers has been observed in the world trading system. Particularly in manufacturing goods, significant reductions have been observed in tariff rates. Substantial improvements in transport and logistics over the years have also contributed to the fall in trade costs around the world. However, international trade remained more costly than domestic trade. This is due to not only costs of transporting goods to far distances, but also at-the-border and behind-the-border costs that can be reduced by appropriate policies. This fact accordingly shifted the attention from reducing policy barriers to promoting trade facilitation.

The OIC countries have equally benefited from this transformation, albeit at varying levels depending on their transport infrastructure, composition of export goods, and their distance to export markets. The current OIC countries are dispersed over a large geographical region, standing at different levels of economic development. The mixed nature of the group of the OIC countries reflects high levels of heterogeneity and divergence in the economic structure and performance of these countries. This also reflects the great potential for trade between the member countries. Partial utilization of this potential has already produced visible benefits and the share of intra-OIC trade continuously increased over the last decade, hitting its highest level in 2015 and accounting

for 19.4% of total OIC trade (SESRIC, 2017), but remained stagnant over the following years (SESRIC, 2022).

Being one of the most critical components of trade costs, transport costs are mainly determined by infrastructure, distance, and commodity characteristics. Higher distance and poor infrastructure are associated with an increase in transport costs. Infrastructure is an important determinant of transport costs, especially for landlocked countries. Improved transportation with greater speed and reliability played a major role not only in trade growth over the past decades, but also in reorganizations of global networks of production. Studies examining customs data consistently find that transportation costs pose a barrier to trade at least as large as, and frequently larger than, tariffs (Hummels, 2007). As tariffs become a less important barrier to trade, the relative contribution of transportation to total trade costs is rising.

Comparing relative contributions of different factors to overall trade costs in the OIC countries, Bagci (2014) suggests that distance remains one of the most significant factors in explaining trade costs among the OIC countries. Better logistics performance and air connectivity are found to reduce the trade costs among the OIC countries. In the case of manufacturing products, distance and trading with landlocked countries are even bigger contributors of trade costs. Better logistics performance and connectivity with partner countries again help to shrink trade costs. Evidently, transportation and connectivity is a critical component of trade costs in the case of OIC countries as well. The following subsection provides further insights on trade and transport costs linkages in the OIC countries.

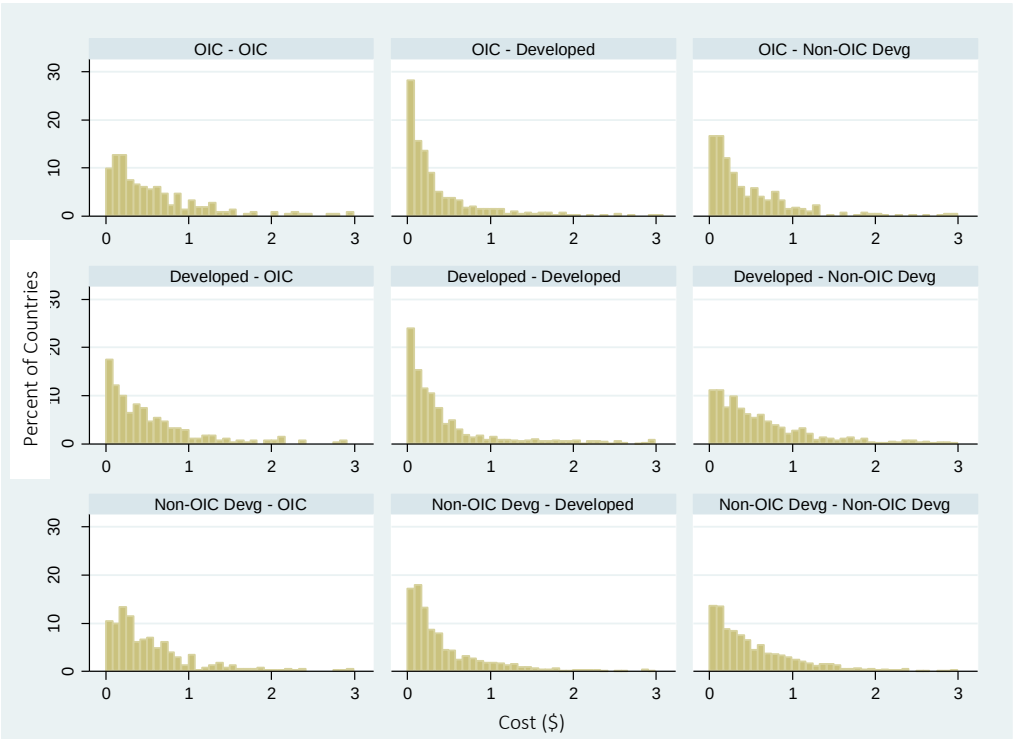
Trade and Transport Costs Linkages in OIC Countries

Transportation costs for a particular product depend on how far the good is shipped, the quality of the transport service offered, and the weight/value ratio of the good. Because all three factors vary considerably across shipments, transportation costs significantly alter relative prices and patterns of trade (Hummels, 2007). This in turn affects competitiveness of firms and countries in different products and sectors. Therefore, it is fair to argue that transportation costs play a critical role in determining location choice of firms and clustering of their economic activities. High transportation costs of parts and components as well as finished products makes the production and delivery processes slow and uncompetitive. This leads firms to move to the locations where they have easy access to markets.

The quality of transportation networks is critical for competitiveness and it can be assessed by the level of transportation costs, which depend on many factors such as modes of transportation, infrastructure and geographical location. There is, however, no global database on transport costs across countries. In most cases, there is no direct way of observing these transport costs between nations, and therefore indirect measurement and trade modelling must be relied upon in order to assess their relevance. For example, estimating the impacts of trade costs on aggregate exports in the case of OIC countries, Bagci (2014) finds that 1% reduction in trade costs can increase exports from OIC countries by 4.3% and intra-OIC exports by 3.9%. UNCTAD has recently initiated its Global Transport Costs Dataset for International Trade, which includes a set of input and output tables distinguished by mode of transport. Provided at 6-digit product classification level, this dataset is

particularly useful for researchers interested in a particular product. At aggregate level, the most common approach in the literature is to use the difference between free-on-board (FOB) and cost-insurance-freight (CIF) values of exports as a proxy for transport costs. However, in this approach, there are commonly many missing and underreported values, and some associated complications, which prevents us to use such estimations.

Figure 3.2: Bilateral Transport Costs, T-shirts



Source: SESRIC staff compilation based on UNCTAD Transport Costs database.
Note: Transport costs are reported for all modes of transport in 2016 per unit per 10,000 km. The first country group in the Figure shows the origin and the second one the destination.

In order to utilize the new dataset by the UNCTAD and to provide some insights on the importance of transport costs, we selected a low-skill intensive product (t-shirt) from the dataset. Figure 3.2 shows the distribution of bilateral transport costs in shipping t-shirts among different country groups. Costs are demonstrated per unit per 10,000km. It is not desirable to have high transport costs for such relatively low-priced products to maintain competitiveness in foreign markets. Yet, while intra-OIC transport costs are comparably higher, transport costs for shipping goods to developed countries are relatively lower for all country groups. For almost 30% of OIC countries shipping t-shirts to developed countries, transport costs are below USD 0.1. Transport costs of goods shipped to developing countries are commonly higher than those shipped to developed countries.

Obviously, lack of transport infrastructure in the destination countries is an important determinant of transport costs to these countries. This would have two implications. For exporting countries, it will be more cost-efficient to export their goods to developed countries. Higher competition in

developed markets would push some producers in developing economies to differentiate their products and become more innovative in their production systems to tap on niche markets in developed economies. For importing countries, consumers in developed countries, due to lower transport costs resulting from better infrastructure and connectivity, will be able to access the same product at a lower cost compared to consumers in developing countries. This represents significant welfare implications across countries due to lack of investment in transport infrastructure and connectivity.

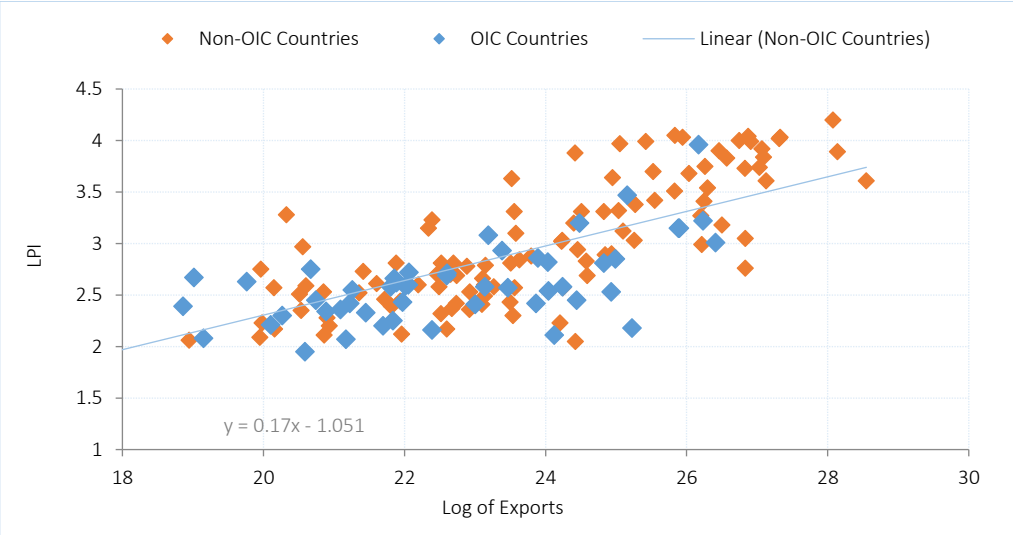
3.3 Assessment of Logistics Performance, Trade and Transport Sector Development

A well-functioning transportation network significantly contributes to the development of commercial relations among countries. While the transport infrastructure and logistics services are critical in fostering trade, transportation services are themselves also an important component of services trade. Countries like Singapore and Hong Kong earn significant amount of revenues by providing maritime transport services. Transport sector is also the second most important services sector in OIC countries. Transport services constituted 27% of all services trade of OIC countries in 2015 (SESRIC, 2017).

Logistics Performance and Trade

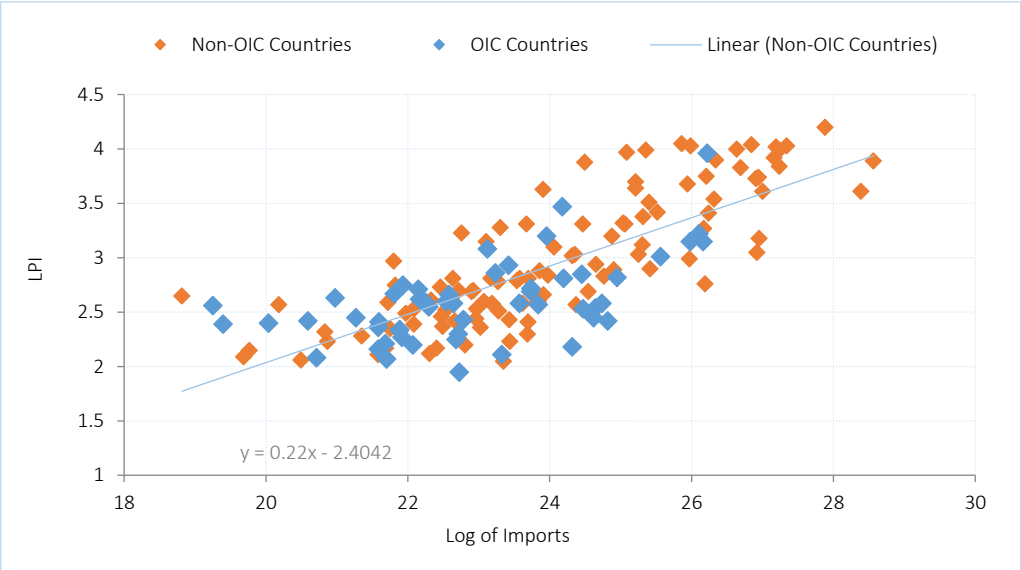
A useful tool to measure logistics performance is the Logistics Performance Index (LPI) (see Box 2.5 above). Figures 3.3 and 3.4 shows the LPI scores against export and import volumes. It is evident that countries with better logistics infrastructure have higher capabilities to export and import goods, and this relationship is highly strong. On the other hand, it is known that countries that primarily export food and agricultural products are low-income countries with little opportunities for logistics services. Figure 3.5 shows that countries with higher share of food exports tend to have low LPI scores.

Figure 3.3: Export Volumes vs Logistics Performance, 2018



Source: SESRIC staff compilation based on World Bank WDI and IMF DOT databases.

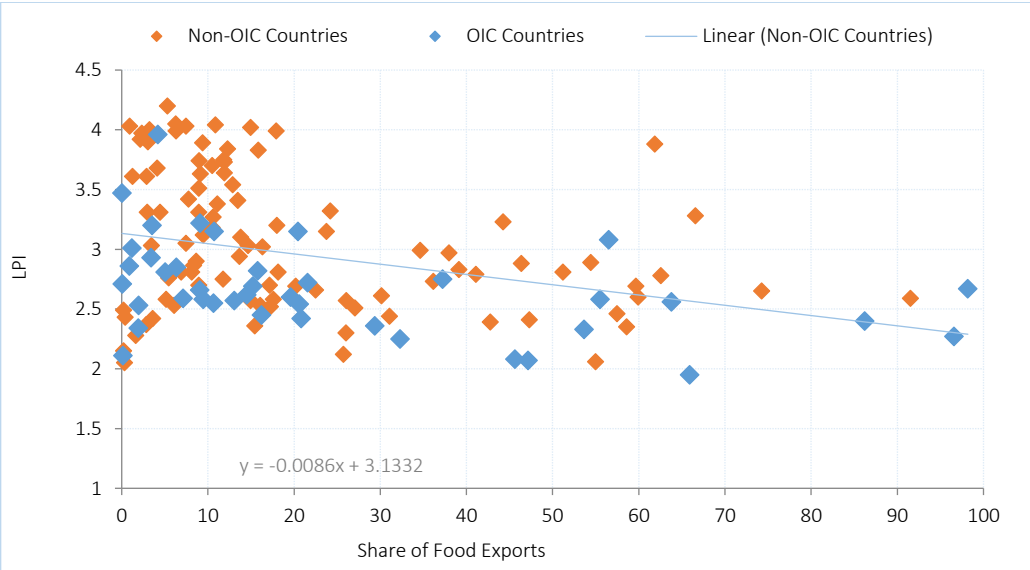
Figure 3.4: Import Volumes vs Logistics Performance, 2018



Source: SESRIC staff compilation based on World Bank WDI and IMF DOT databases.

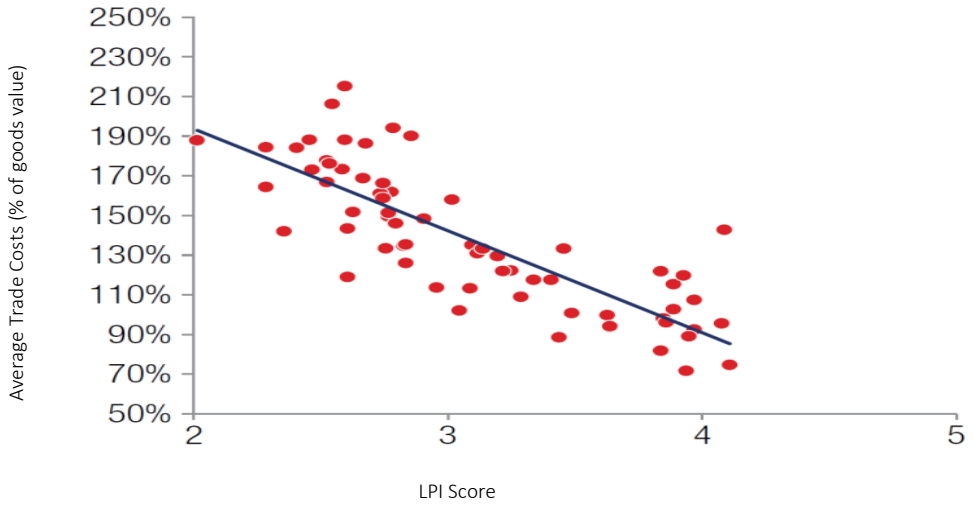
Supply chain bottlenecks are one of the major causes of trade frictions, where trade costs increase with decreasing logistics performance. Reducing trade costs by half would raise trade by 15% and production by 5% globally (World Bank & UN, 2014). As shown in Figure 3.6, there is a very strong negative association between trade costs and logistics performance.

Figure 3.5: Share of Food Exports in Total Exports vs Logistics Performance, 2018



Source: SESRIC staff compilation based on World Bank WDI and IMF DOT databases.

Figure 3.6: Country Trade Costs vs Logistics Performance, 2010



Source: World Bank & UN (2014).

Geography too plays a major role in shaping the economic performances of some countries. There are 44 landlocked countries worldwide, making them both physically and economically more remote from major world markets. Twelve of these countries are OIC member countries, including Kazakhstan, the largest landlocked country in the world. There are five OIC landlocked countries in Africa (Burkina Faso, Chad, Mali, Niger and Uganda) and seven in Asia (Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan). The goods they export and import are mostly transferred at remote foreign ports and transit through neighbouring countries, increasing trade costs due to additional transportation costs (see Chapter 5).

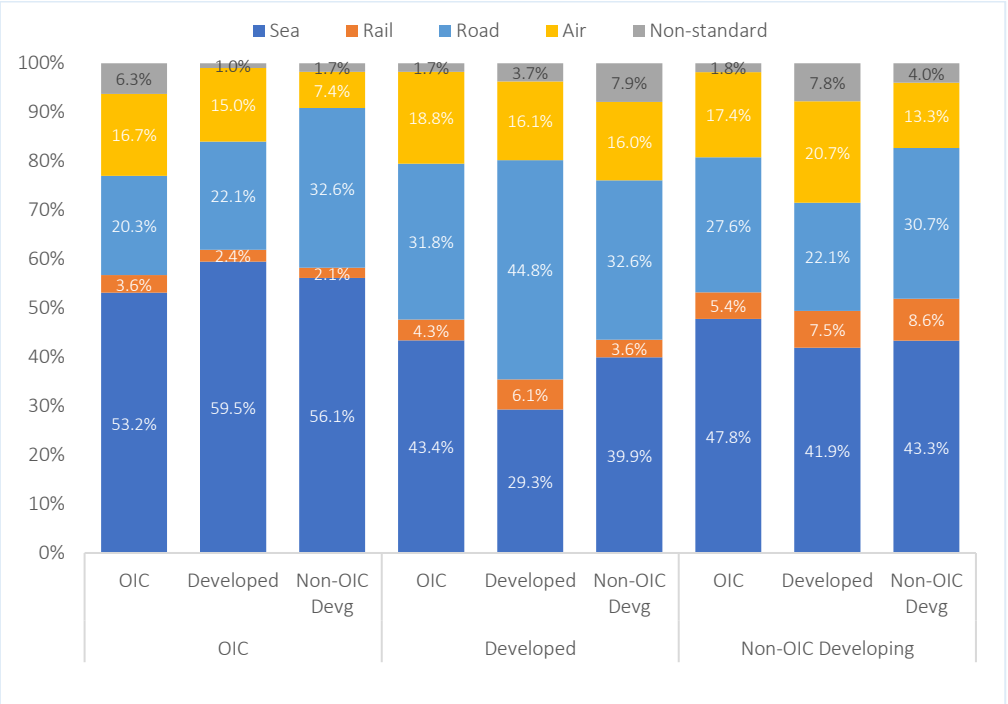
Trade by Different Modes of Transport

When measured in terms of weight, majority of international trade are shipped in bulk cargoes, but its share in total trade is falling when measured in value terms. Maritime transport, whether containerized or in bulk, accounts for over 80% of global trade by volume (UNCTAD, 2021). Therefore, ocean shipping is the backbone of international trade. In spite of technological improvements, however, maritime transport costs have not declined over the last twenty years and still amount to an ad valorem equivalent of 6% of the import's value (Moïse and le Bris, 2013). Road transport is crucial for intra-continental trade and landlocked economies, but the provision of high-quality physical infrastructure cannot lower transport costs without efficient and competitive logistics services.

Proximity of main trading partners, volume and value of the goods exported, connectivity to seaports and availability of improved transportation infrastructure are among the main determinants in the selection of the mode of transport in foreign trade. By utilizing the recent database introduced by the UNCTAD on transport costs for the year 2016, it is possible to calculate the value of exports transported by different modes of transport for the group of OIC countries and other country groups. As demonstrated in Figure 3.7, sea transportation is the most preferred mode of transport. It accounts for more than 53% of intra-OIC trade, almost 60% of exports from

OIC to developed countries, and 56% of exports from OIC to non-OIC developing countries. Road transport is the second most commonly used mode of transport by the OIC countries, which has a particularly high share in their exports to non-OIC developing countries (32.6%). Lack of rail infrastructure prevents the OIC countries to export their goods through railways, which accounts only 2-3% of their total exports. Air transportation appears to be relatively strong when OIC countries export to other OIC countries (16.7%) or developed countries (15%).

Figure 3.7: Distribution of Trade by Mode of Transport, 2016



Source: SESRIC staff compilation based on UNCTAD Transport Costs Database.

On the other hand, intensive commercial linkages between European countries and their geographical proximity to each other contributes to the development of trade by road, which has a share close to 45%. When developed countries export to OIC countries, they mainly use sea (43.4%) and road transportation (31.8%). Similarly, in their exports to OIC countries, non-OIC developing countries mainly use sea (47.8%) and road (27.6%) transportation. Overall, sea transportation is the most commonly used mode of transport in OIC countries with an aggregate share of 57.6%, followed by road (25.1%) and air transport (12.9%).

Table 3.2 shows the top five products at 6-digit level exported by OIC countries by using different modes of transport. Oil- and natural gas-related products constitute the bulk of the exports made by OIC countries through sea transportation. In rail transportation, motor vehicles and textile products have the highest values. In road transportation, there is a mixture of products ranging from petroleum products to electronic products and some precious metals. Precious goods and electronic products occupy the highest ranks in air transportation.

Table 3.2: Top Export Products of OIC Countries by Mode of Transport

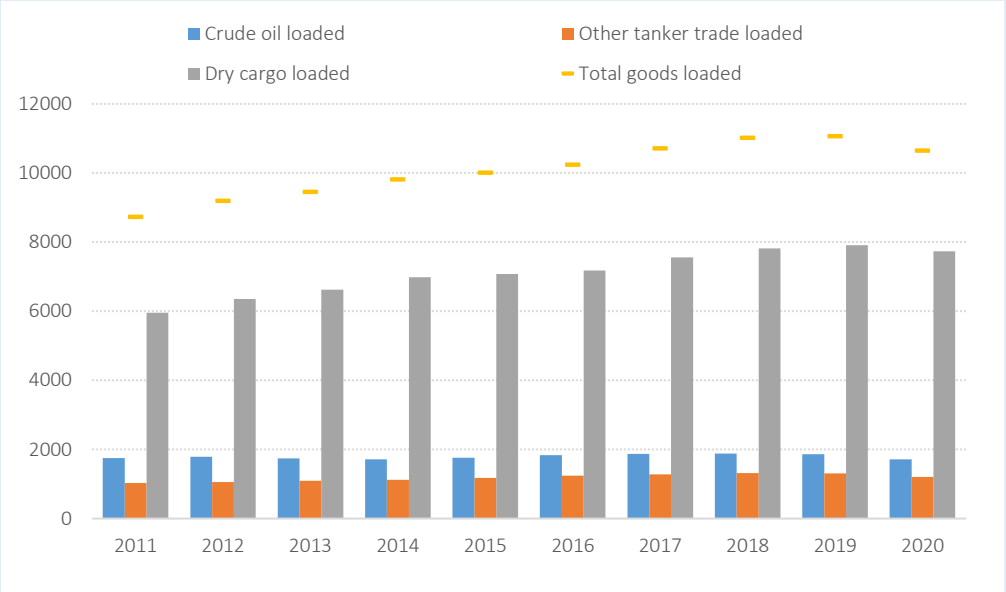
	Product	Exports (CIF, Billion USD)	% of Total	% of Mode
Sea	Petroleum oils and oils obtained from bituminous minerals, crude	246.5	19.4%	33.7%
	Natural gas, liquefied	40.8	3.2%	5.6%
	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s.	27.1	2.1%	3.7%
	Light oils and preparations, of petroleum or bituminous minerals which >= 90% by volume …	18.0	1.4%	2.5%
	Natural gas in gaseous state	15.0	1.2%	2.1%
Rail	Petroleum oils and oils obtained from bituminous minerals, crude	1.1	0.1%	3.5%
	T-shirts, singlets and other vests of cotton, knitted or crocheted	0.8	0.1%	2.6%
	Motor vehicles for the transport of goods, with compression-ignition internal combustion piston engine	0.8	0.1%	2.4%
	Motor cars and other motor vehicles principally designed for the transport of persons …	0.6	0.0%	1.9%
	Motor cars and other motor vehicles, with spark-ignition internal combustion reciprocating piston engine	0.5	0.0%	1.5%
Road	Petroleum oils and oils obtained from bituminous minerals, crude	63.6	5.0%	20.0%
	Electronic integrated circuits as processors and controllers …	23.8	1.9%	7.5%
	Gold, incl. gold plated with platinum, unwrought …	14.2	1.1%	4.5%
	Electronic integrated circuits	9.4	0.7%	2.9%
	Medium oils and preparations, of petroleum or bituminous minerals …	9.3	0.7%	2.9%
Air	Gold, incl. gold plated with platinum, unwrought …	22.9	1.8%	13.9%
	Electronic integrated circuits as processors and controllers …	9.0	0.7%	5.4%
	Articles of jewellery and parts thereof, of precious metal …	4.7	0.4%	2.8%
	Gold, incl. gold plated with platinum, in semi-manufactured forms …	4.1	0.3%	2.5%
	Non-industrial diamonds unworked or simply sawn, cleaved or bruted	4.1	0.3%	2.5%

Source: SESRIC staff compilation based on UNCTAD Transport Costs Database.

Recent Developments in Transport Modes and Their Competitiveness

As shown in Figure 3.8, world seaborne trade have been constantly increasing over the last decade, driven mainly by the growth in dry cargo shipments, reaching over 11 billion metric tons in 2019. Yet, the COVID-19 pandemic caused significant impact on the structure and operations of global transportation networks. During the early periods of the pandemic, the global trade was expected to experience a strong contraction, with severe implications on the shipping sector. Following an initial shock, however, changes in consumption and shopping patterns have led to robust demand for imported goods, a large part of which was to be transported in shipping containers. A vast majority of ports were able to stay open to cargo operations, facilitating the cross border movement of goods and essential supplies. Accordingly, the maritime trade fell only by 3.8% in 2020 (Figure 3.8). International maritime trade flows bounced back in 2021 with 3.2% growth to a total of 11 billion tons – only slightly below pre-pandemic levels (UNCTAD, 2022).

Figure 3.8: World Seaborne Trade by Types of Cargo (Metric tons, in Millions)

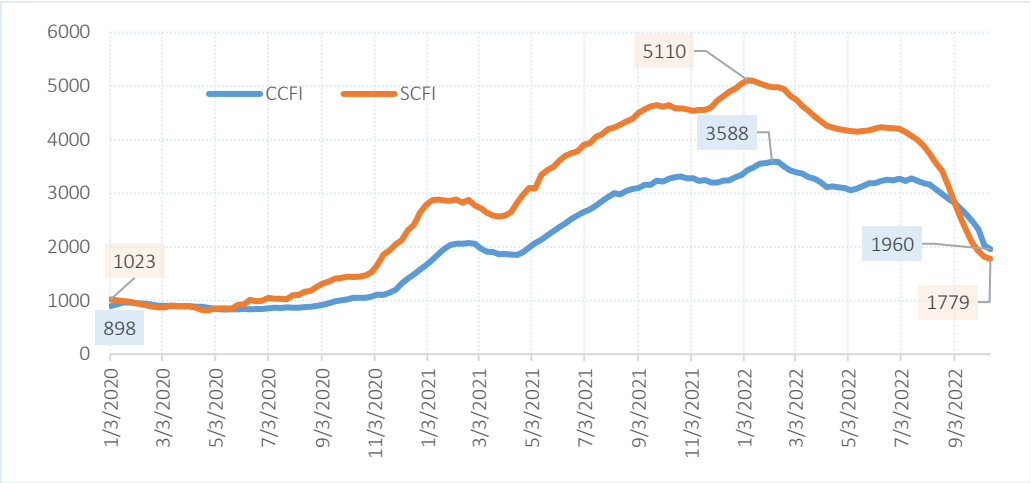


Source: UNCTAD UNCTADStat Database.

During the second half of 2020 and throughout the year 2021, trade and cargo volumes have seen a remarkable recovery, but the changing pattern of consumption and ongoing measures to prevent the spread of the virus, a new challenge was emerged for the maritime transport, namely the container crisis. Various factors contributed to this crisis, but mainly it was due to the failure of relocating the empty containers, but also port labour shortages, port congestions and capacity constraints in truck and other inland transport systems (UNCTAD, 2020). The situation was further exacerbated by the blockade of the Suez Canal by a grounded container ship.

The disruptions resulting from the pandemic and trade imbalances led to shifts in the geography of container trade. Empty boxes were left in places where they were not needed, and relocation had not been planned for (UNCTAD, 2021). The increase in demand was stronger than expected and not met with a sufficient supply of shipping capacity. This led to a surge in freight rates reaching historical highs in 2021. Freight rates from China to South America increased more than four times higher than the median for that route, while the lowest increase was recorded on the Asia–East Coast North America route with 63% increase (UNCTAD, 2021). According to the most recent composite index published by Shanghai Shipping Exchange, the China Containerized Freight Index (CCFI) almost quadrupled between January 2020 and January 2022. The rise in the Shanghai Containerized Freight Index (SCFI) was even higher, which quintupled during the same period (Figure 3.9). These values later moderated, but remained elevated when compared to the pre-pandemic levels.

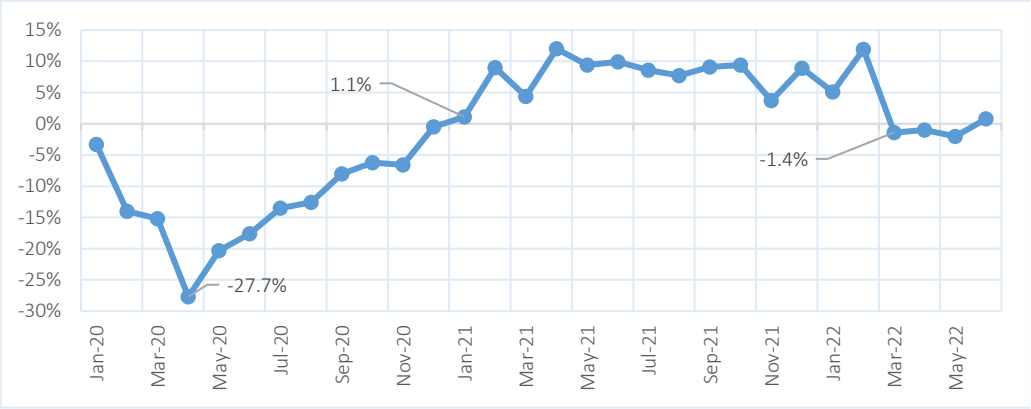
Figure 3.9: China & Shanghai Containerized Freight Index



Source: Shanghai Shipping Exchange & MacroMicro.
CCFI: China Containerized Freight Index; SCFI: Shanghai Containerized Freight Index.

Contrary to the air passenger services, air transport demonstrated a strong rebound in the second half of 2020, reflecting mostly the resumption of international trade after the lifting of initial restrictions that had been in place for most of the second quarter. Many airline companies in the world reacted to this by converting passenger aircraft for full freighter operations. This allowed them to offset some losses they incurred from passenger transportation.

Figure 3.10: Freight Traffic, FTK (Change over 2019)



Source: ICAO Air Transport Monthly Monitors. FTK: Freight Tonne-Kilometres.

As an indicator of air cargo performance, the industry-wide freight tonne-kilometres (FTKs) fell by 10.6% in 2020 relative to 2019. According to the International Civil Aviation Organization (ICAO), this is the fastest rate of annual decline since data collection started in 1990, and slightly worse than what was seen following the world financial crisis in 2009. World freight traffic started to report positive growth rates in 2021 and remained strong throughout 2021 (Figure 3.10). However, with the emergence of Russia-Ukraine crisis, global freight traffic experienced renewed contraction during March-May 2022. Overall, air cargo demand appears to be strong, supported by the gradual rebound in global economic activity and increase in exports, but also highly sensitive to regional and global tensions.

According to the *World Air Transport Statistics 2021* of the International Air Transport Association (IATA), there are three air cargo companies from the OIC region placed among the world's top 10 carriers. FedEx was the world's busiest cargo airline in 2019, while Qatar moved into third place and Emirates was fourth (Table 3.3). Qatar Airways became the largest pure air cargo carrier as it saw its traffic increase by 5.5% year on year to 13.7 billion CTKs. When domestic cargo is excluded, Qatar Airways becomes the world's largest international cargo carrier, followed by Emirates. Turkish Cargo has been expanding rapidly over the last few years through the addition of extra freighter and passenger aircraft in line with the opening of the new Istanbul Airport. The airline has the ambition of becoming one of the top five cargo airlines by 2023. Dubai (DBX) and Doha (DOH) airports were also among the top 10 airports in the world in terms of air cargo loading/unloading volume in 2020. Supported by the growth in these major airline companies, OIC countries continued to increase their share in global air freight, which reached 21.2% in 2020 (See Figure 2.11)

Table 3.3: Top Cargo Carriers – Scheduled CTK (million tonnes)

Rank	Airline	2020		Y-o-Y %	2019	Y-o-Y %	2018	Y-o-Y %
		Total	International					
1 (2)	Federal Express	19,656	10,266	12.3	17,503	0.0	17,499	3.8
2 (7)	United Parcel Service	14,371	7,017	11.9	12,842	3.1	12,459	4.3
3 (1)	**Qatar Airways**	**13,740**	**13,740**	**5.5**	**13,024**	**2.6**	**12,695**	**15.4**
4 (3)	**Emirates**	**9,569**	**9,569**	**-21.6**	**12,052**	**-5.2**	**12,713**	**0.0**
.	…	…	…	…	…	…	…	…
8 (8)	**Turkish Airlines**	**6,977**	**6,958**	**-0.8**	**7,029**	**19.3**	**5,890**	**24.6**

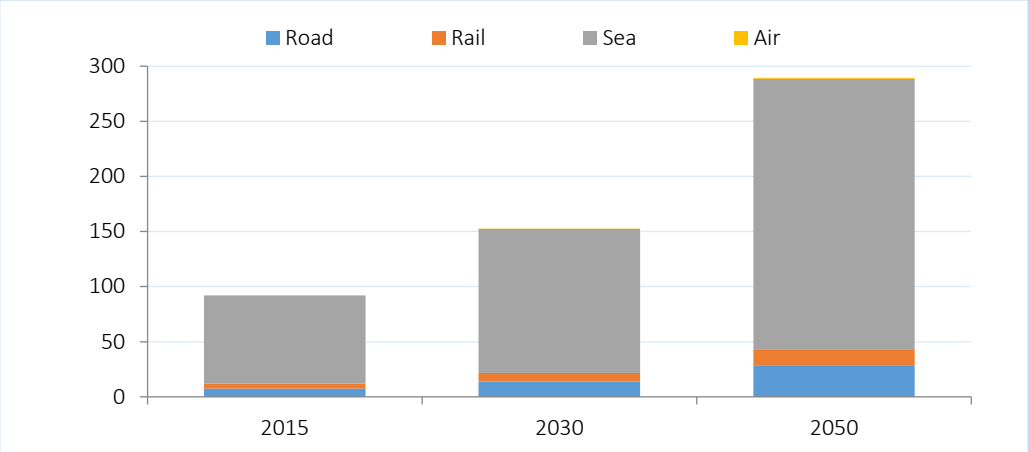
Source: IATA 2021 World Air Transport Statistics.
CTK: cargo-tonne kilometre. Ranks in parenthesis show the cargo volumes based on international transportation only. https://www.aircargonews.net/airlines/top-25-cargo-airlines-fedex-retains-the-top-spot-as-qatar-climbs/

An important economic impact of the pandemic was the supply chain disruptions. Congestion and lack of capacity have led to large increases in shipping prices. Air cargo allows fast shipping but had been roughly 12 times more expensive than ocean trade in the 2-3 years prior to the crisis. When air cargo and ocean freight rates per kg of chargeable weight are compared, the ratio of prices had been trending in the range of 10 and 17 (SESRIC, 2021). While air cargo fares remained elevated, container fares have increased strongly since then, and were more than three times higher than pre-crisis levels in April 2021. As a result, relative price of air cargo vs. ocean declined, supportive for air mode of transport. In Q1 2021, air cargo has grown 5.6% compared to Q1 2019, while container throughput increased by 6.1% (IATA, 2021). With strong consumer demand, air cargo is likely to remain a viable alternative to container shipping for some businesses and firms in OIC countries relying on air cargo are expected to benefit from this trend.

The Future of Freight Flows

International liner shipping is a sophisticated network of regularly scheduled services that transports goods around the world at a lower cost and with greater efficiency than other forms of international transportation. In one year, a single large containership could carry over 200,000 container loads of cargo (World Shipping Council). It would be cost inefficient to carry the goods via freight aircraft or trucks. Global projections indicate that the future of international freight will continue to depend on sea transportation (Figure 3.11). Therefore, it is important for OIC countries to invest in their maritime transport infrastructure to improve their commercial linkages.

Figure 3.11: International Freight Volume by Mode (trillion ton-kilometers)



Source: ITF-OECD (2017).

Even though 12 OIC countries are landlocked, 45 OIC countries have direct connection to sea transportation. However, the level of maritime transportation infrastructure is not highly developed. In the OIC countries, there are only seven ports that are among the top 50 ports by total cargo volume (Table 3.4). The total cargo volume of these ports is barely above the world's top port, namely the Shanghai port. It is essential for OIC countries to invest more in transport and logistics infrastructure, which has a direct impact on a country's handling capacity for imports and exports, distribution route development, the frequency of shipments and the costs of freight handling, storage, distribution and related services.

Table 3.4: OIC Container Ports in Top 50 World Port Rankings (2020)

TOTAL CARGO VOLUME, Million TEU (Twenty-Foot Equivalent Units)					
World Rank	**Port**	**Country**	**2020**	**2019**	**2018**
1	Shanghai	China	43.5	43.3	42.0
11	Jebel Ali, Dubai	United Arab Emirates	13.5	14.1	15.0
12	Port Kelang	Malaysia	13.2	13.6	12.3
19	Tanjung Pelepas	Malaysia	9.9	9.1	9.0
23	Tanjung Priok	Indonesia	6.2	7.6	7.6
37	Tanger Med	Morocco	5.8	4.8	3.5
44	Jeddah	Saudi Arabia		4.4	4.1
47	Salalah	Oman		4.1	3.4

Source: World Shipping Council. https://www.worldshipping.org/top-50-ports

With the rise of developing economies in global trade flows and change in global trade patterns, it is expected to observe significant changes in capacity requirements and global transport networks over the coming decades. ITF-OECD (2016) examines the consequences of increased global trade on the world's transport infrastructure. It estimates that trade in developing economies will grow around 1.5 times quicker than in developed economies and, by 2050, the North Pacific route will become the world's busiest freight route with the biggest flow of goods. Significant growth will

also take place in the Indian Ocean, the Mediterranean and the Caspian Sea corridors. Inland connections will also grow strongly, with freight volumes in intra-Asian trade multiplying by nearly seven times between 2010 and 2050. These projections rely on the assumption that there is no significant infrastructure bottleneck in the future to constrain growth.

An ambitious endeavour to improve the inland and sea connections across Asia and Europe is the Belt and Road initiative of China. It is expected to bring massive improvements in regional and international connectivity through infrastructure upgrades and trade facilitation across a huge geographic area. Indeed, the potentially affected regions cover as many as 63 countries, 60% of the world's population and 30% of global GDP (Herrero and Xu, 2016). Herrero and Xu (2016) also show that a 10% reduction in railway, air, and maritime costs would increase trade by 2%, 5.5%, and 1.1%, respectively. The initiative is also expected to foster trade by further dismantling trade barriers. In fact, Chinese authorities have started considering free trade agreements with the Belt and Road countries. Overall, Herrero and Xu (2016) find that trade in the Asian region will be positively affected by the reduction in transportation costs, with trade increasing 3%.

Such projects are expected to grow inland connections strongly, with freight volumes in intra-Asian trade multiplying by nearly seven times between 2010 and 2050 (ITF-OECD, 2016). According to ITF-OECD (2016), hinterland connections will face the largest capacity challenges, particularly in Asia and Africa, where estimated traffic growth is highest and the limited availability of surface freight infrastructure is becoming an impediment to trade activity.

The expected growth in trade translates into freight volumes growing by 4.2% annually between 2015 and 2030, and 3.3% after that year. In 2050, freight transport is expected to exceed 385 billion tonne-kilometres, or 4.3 times the 2010 figure. Some further highlights from the exhaustive study of ITF-OECD (2016) on the future of freight flows are presented below.

- The traditional trade routes between developed economies will grow relatively slowly, whereas the growth of the trade corridors connecting emerging economies will average 17% annually. By 2050, the transport corridor between the United States and China will be subject to the highest flow of goods.
- Significant growth will also take place in the Indian Ocean and Mediterranean and Caspian Sea corridors.
- Despite the slow growth of the intra-European corridor (1.5% annually), it will still remain, in absolute terms, as one of the most active freight transport corridors in the world.
- Rising food demand, especially in Asia and Africa, will prompt a massive increase in food transport volumes. Agricultural products and food imports in China and Africa will grow exponentially, and by 2050 China and Africa will receive almost 32% and 19% of the total world food transport respectively.
- Surface freight from the international trade of goods is expected to grow faster than maritime. It is projected to grow by over 500% in Asia by 2050 and over 1000% in Africa.
- Projected trade and freight flows at the 2050 horizon highlight the need to assess the capacity of existing national infrastructure such as port terminals, airports or road and rail infrastructure to deal with the bottlenecks that may emerge.

- Looking at the container traffic by 2030, the greatest increases in absolute terms are expected for Southeast Asia (143 million TEU), China (94 million TEU), North Asia (54 million TEU), Western Europe (52 million TEU), and South Asia (37 million TEU) by 2030.
- In relative terms, the largest capacity increases would be needed in South Asia (193%), Southeast Asia (163%), North Africa (138%) and West Africa (137%).
- There would be sufficient capacity planned in most of the regions to accommodate the future traffic growth. Several regions seem to have quite severe over-planning of capacity increases (Table 3.5).

Table 3.7: Container Traffic by Sea Area (2030 and 2050) and Planned Capacity (2030)

Sea Area	Traffic 2013 MTEU	Traffic 2030 MTEU	Traffic 2050 MTEU	Estimated capacity 2013 MTEU	Planned capacity 2030 MTEU	Traffic capacity 2030 MTEU
Greater China	196.4	290	432.2	248.3	363.8	-93.8
Southeast Asia	88	231	426.6	124.4	277.3	-46.3
Western Europe	97.8	149.4	231.3	168.1	238.2	-88.8
North Asia	43	96.5	131.2	70.9	141.6	-45.1
South Asia	19.2	56.2	160.6	29.1	53.1	3.1
Middle East	36.7	50	55.3	50.9	137.6	-87.6
East Coast North America	23.9	29.1	75	42.4	51.7	-22.6
West Coast North America	24.9	36.8	44	43.2	65.5	-28.7
Gulf Coast North America	7.4	13.2	19.1	11.8	33.1	-19.9
East Coast South America	13.2	14.3	22.6	19	35	-20.7
West Coast South America	7.9	9.2	25.3	14	27.8	-18.6
Central America / Caribbean	19.6	202	33.4	29.5	75.4	-55.2
East Africa	8.2	14.6	28.4	13	31.9	-17.3
West Africa	5.4	12.8	31.7	8.8	40.9	-28.1
North Africa	9.8	23.3	40.3	13.2	47.4	-24.1
Southern Africa	4.7	8.9	20.1	7.8	15.5	-6.6
East Mediterranean & Black Sea	16.8	23.6	58.2	27.5	65.1	-41.5
Oceania	11.2	16.2	36.4	17.1	23.9	-7.7
TOTAL	**634.3**	**1095.2**	**1871.9**	**938.7**	**1744.9**	**-649.5**

Source: ITF-OECD (2016).
Note: MTEU stands for Million Twenty Foot Equivalent Unit

3.4 Final Remarks and Policy Implications

The idea that improved transport infrastructure should foster trade is of course very intuitive. However, it is less certain that countries would equally benefit from improved connectivity. When it comes to transportation, some countries will have geographic advantage and if they invest in their transport and logistics infrastructure, they can be at the intersection of multiple transport corridors and attain great benefits. Among the many benefits of improved connectivity, trade stands out first. Reduced transport costs facilitate trade even at long distances.

This section of the report reveals that there is a strong linkage between transport infrastructure and trade flows. Previous studies still emphasize that distance remains the largest contributor to trade costs. Aside from constantly falling trade-policy barriers and transport costs, trade costs continue to remain large. The findings suggest several policy recommendations for the OIC countries to reduce trade costs and promote intra-OIC trade.

Being a critical factor in trade, logistical infrastructure in the OIC countries is not sufficiently developed. This in turn significantly increases trade costs and makes the firms that wish to export

relatively uncompetitive compared to the firms that export from countries with relatively well developed logistical facilities. Air connectivity also facilitates the movement of people and goods in a relatively shorter period of time. If countries are connected with many destinations, their communication, delivery, and other formalities in terms of export will be much easier and a facilitating factor in trade. Therefore, logistics infrastructure in the OIC countries should be developed to facilitate trade among the OIC countries as well as with other partners.

It should be noted that world trade takes place increasingly in parts and components, with each country specializing in particular stages of a good's production sequence. A key feature of this vertical specialization is that imported inputs are used to produce a country's export goods, which also reflects an international division of labour. An important driving force for growing vertical specialization has been trade barrier reduction. Despite several re-export and border crossings, reductions in trade barriers yield a multiplied reduction in the cost of producing a good sequentially in several countries. In order to be able to take larger share in this form of production and trade, it is required to have efficient and fast transport and trade mechanisms in place in addition to appropriate factors of production.

Fostering economic cooperation among its member states has been an integral part of OIC's agenda for development, and over the years, the OIC and its institutions have made serious efforts to realize this objective. Among the most critical endeavours was the creation of the Trade Preferential System among the Member States of the Organization of Islamic Cooperation (TPS-OIC), which came into effect on July 1, 2022. This could significantly contribute to the elimination of certain trade barriers, but there is a need for greater participation from the member states to make this happen.

On another front, digitalization plays a crucial role in supporting the transport and trade sectors by revolutionizing their operations and processes.

Through digitalization, supply chain visibility can be greatly improved. Real-time tracking and monitoring of goods become possible with technologies like GPS, RFID, and IoT sensors. It becomes easier to gain access to accurate information about the location, condition, and status of shipments, optimizing logistics operations and minimizing delays. Route optimization algorithms, real-time traffic monitoring, and fleet management systems enhance transport efficiency. Therefore, efforts should be made to integrate the advanced digital technologies into transport and trade operations to improve efficiency and predictability.

Reducing transport costs by improving transport infrastructure and logistics is essential if the OIC countries are to scale up their competitiveness and participate in the prosperity created by the world trading system. This would also increase the volume of exports from the OIC countries. However, many OIC countries are not performing well in terms of logistics and transport infrastructure. A number of issues need to be addressed in order to improve logistics services and transport infrastructure to promote trade.

Improving the trade and transport related infrastructure requires developing and managing domestic and international freight corridors and upgrading existing transport links. Comprehensive corridor development requires the infrastructure for transportation that crosses multiple national borders, which consist of "hard infrastructure" such as ports, railways, highways, cargo

transhipment facilities, national border facilities, weighbridges (truck scales), and inland container depots as well as "soft infrastructure" such as cross-border transport laws, regulations related to border crossing, and organizational systems and resources for smoothly operating and maintaining the hard infrastructure mentioned above. In improving the transport infrastructure, private sector participation can be supported with special provisions. Planning and developing logistics hubs and facilities would improve logistics performance (Celebi, Ojala and Kauppila, 2015).

Efficiency of the clearance process at borders is also critical in fostering trade with logistics and infrastructure. This would require simplifying and shortening border crossing procedures, eliminating corruption and unofficial payments, introducing a single point of entry for information used in clearing cargo, promoting cross-border cooperation in monitoring and clearing cargo and improving trade security. Avoiding operations that cause unnecessary delays in transportation and improving management of handling operations in ports would bring important benefits in terms of improving logistics performance. As such, One-Stop Border Posts (OSBPs) situated across borders are a means to streamline the movement of people, goods and services along corridors. An OSBP is a border facility to enable immigration and customs control of two neighbouring countries at a single site; two countries thus share a common legal framework, procedures and border control equipment. This reduces the journey time for transporters and travellers, and shortens the clearance time at border crossing points.

To this end, efforts should also be made to benefit from rising digitalization while facilitating trade. Digitalization streamlines documentation and enables paperless processes. Electronic data interchange, digital signatures, and electronic certificates digitize and automate trade-related paperwork. This simplifies customs declarations, permits, and compliance checks, reducing paperwork, minimizing errors, and accelerating the movement of goods across borders. Initiatives such as single window systems should therefore be prioritized to augment the positive externalities of transport development on trade. Digital platforms also facilitate automate cargo tracking, and enable secure and efficient exchange of information between traders, customs authorities, and other stakeholders, promoting smoother trade transactions.

It is also important to easily arrange competitively priced shipments to facilitate trade. This requires reducing market entry and exit barriers in the logistics sector, upgrading telecommunications services to support logistics, stimulating multi-modal transport, and creating incentives to support investments in logistics services. Introducing online systems for real time clearance monitoring, and promoting utilization of latest tracking and monitoring systems would improve the ability to track and trace consignments.

Another aspect of improving logistics performance for trade is progressing competence and quality of logistics services. Governments should create incentives to upgrade transport fleet and encourage better integration of logistics services for trade and distribution. They can also allow introduction of new technologies for tracking and security and support higher education in areas of logistics and transportation. They can also be pioneer in introducing modern supply-chain management techniques.

4. Impacts of Transportation on Tourism

A country or a region without efficient and developed transportation networks cannot sustain growth in the tourism sector. In this regard, this chapter analyses the impact of transportation on tourism with a specific focus on the OIC countries. The chapter first looks at the importance of transportation for the development of tourism in the OIC countries. Then, it evaluates the state of the tourism sector in the OIC countries in a comparative perspective. The chapter further elaborates on a number of transportation-related challenges ranging from underdeveloped transportation networks to regulative environment that constitute hindrances to the development of tourism.

4.1 The Role of Transportation in Development of Tourism

Effective transportation infrastructures facilitate the movement of people and goods within or between areas. In particular, transportation networks provide access to various destinations within or outside the country. To this end, countries around the globe and many OIC countries often invest in efficient transportation networks that ease the mobility of people (i.e. tourists) and support the development of domestic, regional, and international tourism markets. The increased domestic or international tourism activities ultimately foster economic and regional development.

The degree of using potential tourism resources heavily depends on transportation connectivity. The improvement of transportation connectivity increases the accessibility of areas with unexploited tourism resources along with their proximity to large population centres, which are generally the main feeders of tourist flows. Consequently, the increase in tourist flows has a positive impact on the establishment of tourism entrepreneurship and or related services (Polyzos and Tsiotas, 2020).

International tourism is one of the main economic activities and an important source of foreign exchange earnings, economic growth, and employment in many developed and developing countries, including several OIC countries. Thanks to the availability of wide transportation networks, globally 1.5 billion international tourist arrivals were recorded in 2019, before the outbreak of the COVID-19 pandemic (UNWTO, 2020). In the same year, around 10.3% of the world's GDP (USD 9.6 trillion) and 10.3% of all jobs (333 million) were generated in this sector (WTTC, 2022). The revenues generated by tourists, i.e. international tourism receipts, in terms of current US dollar prices, reached USD 1,466 billion in 2019 (SESRIC, 2022). The figures further reflect that the tourism sector created one in every four new jobs across the globe in 2019.

Tourism can also play an important role in the global fight to reduce poverty and achieve the Sustainable Development Goals (SDGs) as well as an enabler for the OIC countries to attain several objectives of the OIC 2025 Programme of Action. In particular, by generating economic benefits

and boosting productive capacities, tourism has the potential to foster inclusion by reducing poverty and inequalities among vulnerable groups such as the poor, youth, and women. Moreover, the growth in the tourism sector has spurred activities in other sectors of the economy such as horticulture, handicrafts, agriculture, construction, and even poultry.

Besides, intraregional tourism is a precursor to promoting the region for international visitors, particularly from the neighbouring countries. Intraregional or international tourism activities strengthen capacities within a region to develop better structures and institutions to rectify some of the common challenges faced, ranging from weak intraregional transportation linkages and visa restrictions to non-standard practices at customs.

Among other benefits, tourism provides an avenue for increased economic cooperation and policy dialogue, especially among neighbouring countries located in the same region. In particular, tourism promotes regional integration through increased trade and economic activities and helps countries to better understand each other. There is strong evidence that points to the fact that there is a correlation between tourism flows and regional as well as international trade (Aradhyula and Tronstad, 2003). Through increased tourism among countries in a region, transaction costs for tourists tend to go down due to increased mobility and the exchange of currencies. Finally, increased tourism activity has the power to promote tourism in a region by investing in and facilitating transport, particularly air transport (UNCTAD, 2017).

The potential economic benefits and the emerging developmental challenges have motivated a number of countries in several regions across the globe to integrate through transportation networks with a view to enhancing their respective comparative advantages and in so doing advancing their regional competitiveness. The relationship between transportation networks and tourism development, could therefore be regarded as symbiotic, whereby, on the one hand, the tourism sector is viewed, particularly by the regional economic groups/blocks, as a vehicle for promoting regional integration. On the other hand, transportation networks are seen as an avenue through which countries can address various tourism development challenges and maximise opportunities thereof.

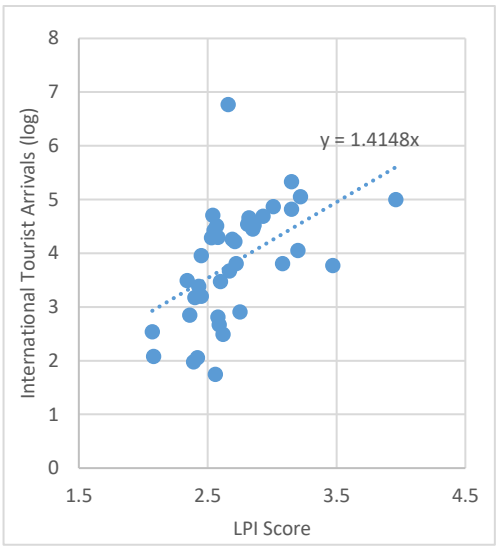
Importantly, at the OIC level, tourism is an important driver of intra-OIC economic cooperation. Regional transportation corridors provide an opportunity to bring together both public and private stakeholders from neighbouring OIC countries and offer a venue to address the harmonization of transport regulatory frameworks and standards, as well as broader issues of intra-regional trade and tourism activities. Therefore, building up new transportation networks or improving the existing ones has the potential to take the intra-OIC tourism cooperation to greater heights.

Linking Transportation with Tourism

Given the increasing importance of the tourism sector for economic growth and development, many countries all across the globe including several OIC countries have started to look for ways and means to trigger and sustain the growth of this sector. One of the effective ways of enhancing the growth of the tourism sector is to develop transportation networks and strengthen their capacities. As international tourism is a cross-border activity, transportation networks and their efficiency directly affect the tourism sector including tourist arrivals, tourism revenues, and

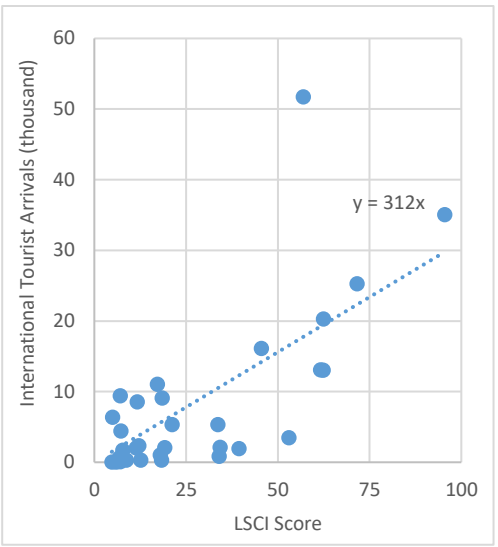
satisfaction of tourists from their visits (Mammadov, 2012). In addition, the development of domestic tourism activities is also closely linked with the availability of effective transportation networks that helps save time and money while traveling between destinations.

Figure 4.1: Logistics Performance Index (LPI) vs. Tourist Arrivals, 2018



Source: SESRIC staff compilation based on data from World Bank and UNWTO.
Note: Each dot represents an OIC country.

Figure 4.2: Liner Shipping Connectivity Index (LSCI) vs. Tourist Arrivals, 2019



Source: SESRIC staff compilation based on data from World Bank and UNWTO.
Note: Each dot represents an OIC country.

Several international indices and indicators support the association between transportation networks and tourism activities. In this context, Figure 4.1 displays the association between the Logistic Performance Index (LPI) (see Box 2.5 above) and the number of tourist arrivals in the OIC countries. It shows that there is a meaningful positive correlation between the LPI and tourist arrivals in a sample of 39 OIC countries for the year 2018. All else equal, a 1-unit increase in the LPI score of OIC countries, on average, leads to a 1.4% increase in tourist arrivals.

In a similar vein, Figure 4.2 reflects the correlation between the Liner Shipping Connectivity Index (LSCI) (see Box 2.4 above) and tourist arrivals in the OIC countries. There is a positive relationship between the LSCI and tourist arrivals in a sample of 31 OIC countries for the year 2019. A 1-unit increase in the LSCI score of OIC countries, on average, leads to a 312 thousand increase in tourist arrivals.

In summary, both the LPI and LSCI reveal that there is a positive association between transportation networks and tourism in the OIC countries. Moreover, there are also studies that looked into the interlinkages between transportation and tourism in the OIC countries, such as SESRIC (2016a and 2016b). These studies revealed that road density, railway density, and air transportation density are all positively correlated with per capita tourism receipts in the OIC group. Overall, the positive linkages between tourism and different modes of transportation networks are confirmed by various studies and statistics in the sample of OIC countries.

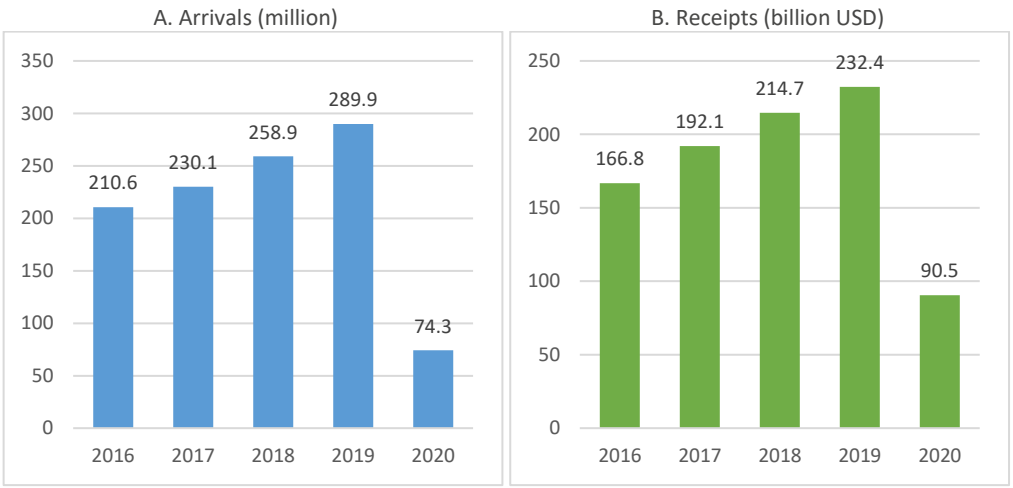
4.2 State of Tourism in OIC Countries

With their rich and diverse set of natural, geographic, historical and cultural attractions, OIC countries, as a group, possess a significant potential for the development of a sustainable international tourism sector. Before the outbreak of the COVID-19 pandemic in 2020, the OIC countries, as a group, experienced a positive momentum in terms of both international tourist arrivals and tourism receipts. Due to the widespread containment measures and travel restrictions imposed because of the pandemic, however, international tourism activities dropped significantly worldwide as well as in the OIC countries.

An Overview of the Performance of OIC Countries

International tourist arrivals in the OIC countries, for which the data are available, climbed up from 210.6 million in 2016 to 289.9 million in 2019 (Figure 4.3.A). A similar impressive growth was observed in international tourism receipts, which increased from USD 166.8 billion to USD 232.4 billion during the same period (Figure 4.3.B). Nevertheless, the COVID-19 pandemic hit severely the positive trend in international tourism activities in both the OIC region and elsewhere. Due to the widespread containment measures and travel restrictions, international tourism activities dropped significantly worldwide. The OIC countries, as a group, recorded a decline of 74.7% in international tourist arrivals in 2020, reporting only 74.3 million arrivals. In a similar direction, their international tourism receipts went down from USD 232.4 billion in 2019 to USD 90.5 billion in 2020, corresponding to a historical 61% contraction.

Figure 4.3: International Tourist Arrivals and Receipts in OIC Countries

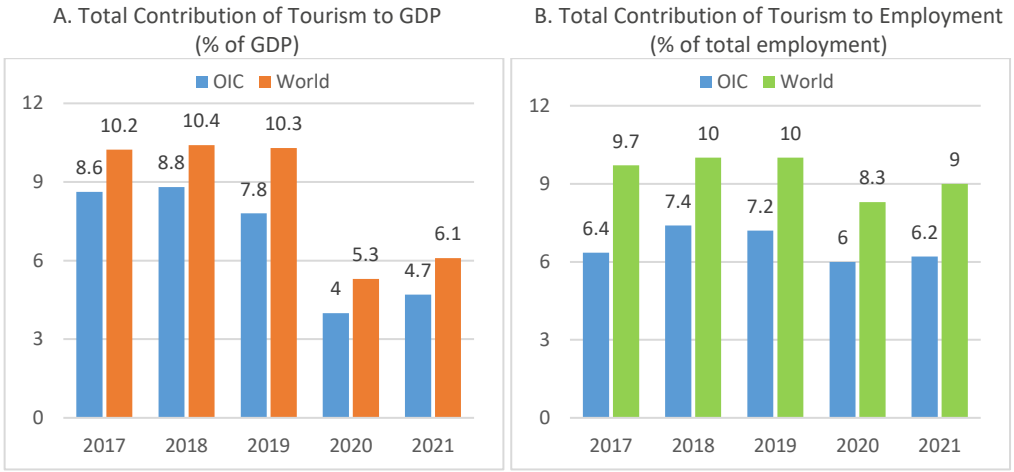


Source: SESRIC staff compilation based on data from UNWTO.

The tourism sector is an important component of the economies of many OIC countries, though its contribution to their GDP, on average, has weakened in the past two years because of the pandemic. The total contribution of tourism to GDP in OIC countries, on average, climbed up from 8.6% in 2017 to 8.8% in 2018. In 2019, the average of the OIC group witnessed a slight decrease and was recorded at 7.8%. Due to the COVID-19 pandemic, this share further went down in 2020 and 2021 (Figure 4.4.A). The estimated size of the loss in GDP stemming from the contraction in

the travel and tourism sector was measured at USD 293 billion in 2020, mainly due to a variety of measures taken to contain the spread of the virus (SESRIC, 2022). Similarly, the total contribution of international tourism to employment, which increased from 6.4% in 2017 to 7.2% in 2019, was recorded at around 6% in 2020 and 2021 due to the pandemic (Figure 4.4.B).

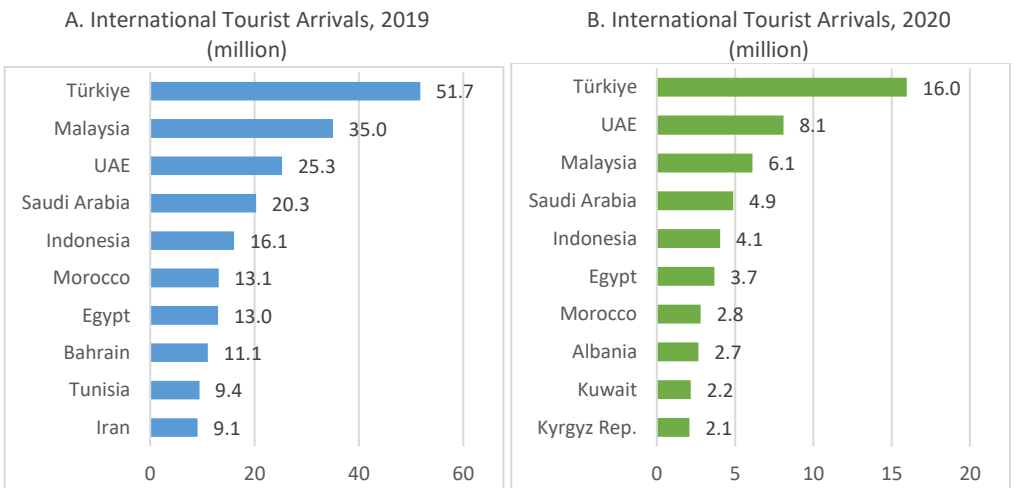
Figure 4.4: Contribution of International Tourism to Economy



Source: World Travel and Tourism Council (WTTC).

Not all OIC countries showed similar performance in the tourism sector over the past years. At the individual country level, it is observed that international tourism activity, in terms of both tourist arrivals and tourism receipts, is still concentrated in a few countries. In 2019, Türkiye, Malaysia, and the United Arab Emirates were identified as the top-performer OIC countries in terms of international tourist arrivals (Figure 4.5.A). Together with Saudi Arabia, Indonesia, Morocco, Egypt, Bahrain, Tunisia, and Iran, the top 10 OIC countries hosted 204.2 million international tourists, corresponding to a share of 70.4% in the total OIC tourist arrivals. In 2020, again, Türkiye, United Arab Emirates, and Malaysia topped the list among the OIC destinations (Figure 4.5.B).

Figure 4.5: Top-10 Tourism Destinations in the OIC Region in 2019 and 2020

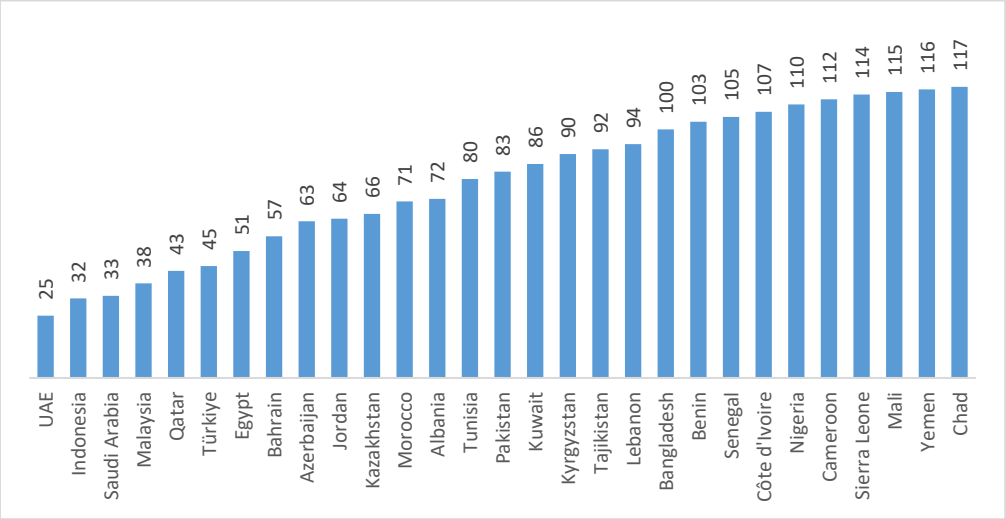


Source: World Travel and Tourism Council (WTTC).

An overview of the top tourism destinations in the OIC region has revealed that such destinations often have well-developed transportation networks, which enable flows of tourists. For instance, top tourism destinations such as the United Arab Emirates, Türkiye, and Malaysia were also among the OIC countries with the highest LPI scores in 2018 (see Figure 2.16 above). Other major tourism destinations in the OIC region like Saudi Arabia, Bahrain, and Iran also obtained relatively high LPI scores in 2018.

In a similar fashion, as shown in Figure 4.6, the United Arab Emirates, Indonesia, Saudi Arabia, Malaysia, Qatar, and Türkiye obtained the highest scores in the OIC region and globally ranked among the top-50 countries in 2021 in the World Economic Forum's Travel & Tourism Development Index, which measures "the set of factors and policies that enable the sustainable and resilient development of the Travel and Tourism (T&T) sector.[3] A key implication of this analysis is that those OIC countries that are willing to attract more international tourists are required to improve their connectivity with the rest of the world and invest in transportation networks. Such investments could pave the way for the development of sustainable, reliable, and efficient transportation networks in the OIC region and support the development of the tourism sector.

Figure 4.6: Global Rank of OIC Countries in the Travel & Tourism Development Index, 2021



Source: World Economic Forum's Travel & Tourism Development Index dataset.

Tourism and Transportation amidst the COVID-19 Pandemic

As the tourism sector has direct and indirect linkages with 185-supply side activities in the economy, a shock (e.g. a pandemic) could have the potential to affect a chain of economic activities from transportation to hoteliers (OECD, 2020). The containment measures taken to curb the COVID-19 pandemic have brought severe disruptions to nearly every aspect of domestic and international transportation. Passenger transportation within and across borders was hit hardest due to strict quarantine measures. Cargo transportation and logistics remained more robust during

[3] The index is comprised of five subindices including a "transportation infrastructure subindex", 17 pillars and 112 individual indicators (WEF, 2022).

this period, despite experiencing occasional interruptions and obstacles over time. The resilience of marine transportation has been particularly critical in avoiding supply chain interruptions across regions.

Physical spacing requirements and quarantine requirements have drastically reduced available transportation capacity both for domestic and international travel. In particular, prohibitive quarantine measures, travel and mobility restrictions, and social distancing measures, amongst others, have resulted in a significant reduction in domestic and international travel. In turn, this has negatively affected the demand for services in the transportation industry (SESRIC, 2021).

Consequently, the tourism sector in the OIC countries was also severely hit by the pandemic, as demonstrated above in Figure 4.3 and 4.4. The devastating impacts of the pandemic, which have eroded confidence in international travel, and the strict containment measures put in place resulted in significant losses in terms of both tourist arrivals and tourism receipts. The biggest crisis in the history of the tourism sector since World War II, the pandemic has got back the gains made over the past decade in the OIC group in terms of international tourist arrivals and tourism receipts, intra-OIC tourism activities, job creation, and contribution to the GDP (SESRIC, 2022).

Overall, the pandemic affected the tourism sector and the travel industry alike in the OIC region and beyond. For example, reduced demand for air travel has not only reduced revenues of airline carriers, but also lowered the need for transport operators to invest in newer aircraft and lowered operational capacities of airports, affecting approximately 65 million people employed in the aviation industry around the world (SESRIC, 2021).

As compared to 2019, the aviation traffic volume (measured in revenue passenger kilometres) reduced by 65.9% in 2020. In 2021, passenger traffic improved by merely 6.2% as compared to 2020 (IATA, 2021a). As compared to 2019, there was a loss of 56.1% in airline revenue in 2020. The industry recovered with an improvement of 26.5% in revenues in 2021. IATA (2021b) foresees that air passenger numbers are expected to recover fully from the pandemic-related disruptions by 2024. The cruise/passenger market, which showed a decline of between 50% and 90% in 2020, was also negatively affected by the COVID-19 contagion (SESRIC, 2021).

In rail and road transportation, restrictions on services and people's movement, combined with authorities' advice to not travel, have led to a decrease in passenger volumes of approximately 80% for all national rail services during lockdowns. For international rail passenger services, the passenger volumes have fallen by almost 100% for all operators, in line with international passenger border closures. The volume of loss was estimated between USD 78 and 125 billion in 2020 because of the pandemic (SESRIC, 2021).

Many OIC countries have developed and implemented a wide range of policies to mitigate the negative impacts of the pandemic on the tourism and transportation sectors, support various stakeholders, and restart tourism activities. During the pandemic, in the existence of international travel restrictions, many countries around the globe paid special attention to domestic tourism activities as an alternative way to sustain and revive the tourism and travel industry (UNCTAD, 2021). A number of OIC countries like Uganda, Malaysia, and Jordan have also followed suit and

organized several campaigns to boost domestic tourism to support economic growth and resume tourism and travel activities.

Besides, several OIC countries like Algeria, Saudi Arabia, and Bangladesh have established an internal crisis mechanism/team at the level of the Ministry of Tourism with an objective to manage the negative impacts of COVID-19 on the sector. Some OIC countries also worked out crisis management teams responsible for reviving the tourism sector in their respective countries. For instance, the Ministry of Tourism & Antiquities of Palestine has established the "Palestine Tourism Recovery Taskforce", which includes members from the Ministry and the private sector associations with a number of objectives on addressing the crisis. Several OIC countries like Türkiye, Algeria, and Bangladesh developed and put into practice some health protocol-related measures targeting the tourism sector. A number of OIC countries have offered stimulus packages to assist business entities that create jobs and minimize job losses. For instance, Saudi Arabia decided to pay 60% of the salary for private-sector workers affected by COVID-19.

The pandemic has also affected the tourism and transportation sectors and influenced policies and tools in the post-pandemic period. For example, digitalization has emerged since the beginning of the pandemic with long-term implications in the post-COVID era. The concepts like paperless travel, digital certificates, and online check-in have eased travellers' life by reducing the time and energy spent on journeys. In this respect, OIC countries need to develop effective policies in the post-pandemic era to cater to the evolving needs and expectations of travellers by involving stakeholders from the transportation and tourism sectors.

4.3 Transportation Challenges for the Tourism Sector

The OIC countries, as a group, possess a significant tourism potential that could be an enabler for sustainable development. Yet, given the modest share of the OIC region in the world tourism market and the concentration of tourism activity in a handful of OIC countries, apparently, a significant part of this potential remains untapped.

The challenges faced by the OIC countries during the development of a sustainable tourism sector are diverse as each country has its own tourism-related characteristics, level of development, and national priorities. Nevertheless, it is evident that the OIC countries with improved transportation networks tend to host more international tourists, as discussed above in section 4.1. In this regard, the challenges related to transportation networks and transportation infrastructure are a prime concern in many OIC countries. In this context, the following part summarizes the major challenges and bottlenecks that the OIC countries face at the nexus of transport and tourism development.

Underdeveloped Transportation Networks

Underdeveloped and ineffective transportation networks in many OIC countries lead to underinvestment in tourism-related infrastructures such as hotels and lodging services, and tourism information services. This makes it difficult to provide tourism products and services at international standards and reduces the competitiveness of tourism destinations in the OIC countries.

More than half of all overnight visitors worldwide reach their destination by air (UNWTO, 2016). Despite its critical relevance, air connectivity is one of the major constraints on the growth of tourism in many developing countries due to cost ineffectiveness, diseconomies of scale, poor infrastructure, and safety and security concerns. In some OIC countries, insufficient flight routes, lack of direct connections, and inadequate transport links to tourist sites can make it difficult for tourists to access and explore different destinations within the country. This discourages the growth of tourism activities in some countries and regions.

In addition, other modes of transport including road, rail, and maritime lines are important for the development of international tourism. As many OIC countries suffer from limited financial resources for the improvement of transport networks, joint infrastructure projects for facilitation of tourism (e.g. cross-border railway projects, regional hub-airports) would play a key role in unleashing the potential of the tourism sector. For instance, the Dakar-Port Sudan railway corridor project is an important initiative of the OIC that has the potential to scale up regional tourism and intensify regional integration among member countries located in West and East Africa (Box 2.2).

Limited Involvement of the Private Sector

Given the shortages of public investments, the private sector could play a critical role in the development of tourism activities and the building up of transportation networks. Yet, the limited private sector engagement in the development of transportation networks in the OIC countries remains an important challenge. Alternatively, Public Private Partnership (P-PP) modality offers a unique solution to financing big-scale projects that can improve transportation networks and promote tourism (SESRIC, 2014).

Visa Costs and Tight Visa Policies

Transportation offers people the possibility to move across borders and this is important for two reasons. First, it deals with the ability of tourists to enter their destination, and second, it enables people seeking employment in the tourism sector to work and investors to establish themselves at the tourist destination. UNWTO and WTTC (2012) found that facilitative visa policy changes helped increase tourist arrivals from the affected markets in a range of 5 to 25% per year, on average, over a three-year period.

Restrictive visa policies discourage potential tourists to visit countries in their respective regions and therefore slow down the regional integration process. In order to boost intraregional tourism, several regional economic communities offer or are in the process of creating a universal tourist visa, a visa that is valid in all member countries that join the scheme. The most well-known example is the Schengen visa system seen in the European Union countries. In the East African Community (EAC), Kenya, Rwanda and Uganda launched an East African tourist visa. In the Southern African Development Community (SADC), Botswana (park visits), Zambia and Zimbabwe have adopted the Kavango-Zambezi Transfrontier Conservation Area (KAZA) Univisa.

In addition, facilities and formalities to obtain visa are important for tourism. For instance, tourists who are willing to visit and explore a region have to pass from one country to another. Cross-border movement in some land-border checkpoints are not as easy as in the international airports

due to weak ICT infrastructure and lack of well-trained staff. International tourists sometimes are not able to obtain a visa or use their issued visas at certain check-points, and therefore they are diverted to another checkpoint with full service facilities. Such difficulties that stem from weak transportation and communication infrastructures constitute a hindrance for the development of tourism.

Lack of Joint Tourism Policies at the Regional Level

A comprehensive regional tourism policy is needed to provide a conducive environment for tourism development. Ghimire (2001) argues that regional tourism cannot flourish and contribute to economic diversification and structural transformation if it is not integrated into regional planning processes. Yet, developing a regional tourism policy without considering the role of regional transportation networks is impossible. Successful regional tourism policies often include the development of various modes of effective transport links in a certain region with contributions from neighbouring countries. In this way, international trade, investment, and tourism could be promoted and developed in a certain region.

Some regional organisations already recorded progress in this area. For instance, the Southern African Development Community (SADC) adopted the Protocol on the Development of Tourism in the Southern Africa Development Community in 1998. Another example can be given from the Association of Southeast Asian Nations (ASEAN). In January 2009, in Hanoi, Vietnam, the heads of the ASEAN Tourism Association (ASEANTA) and the ASEAN Competitiveness Enhancement (ACE) Project signed a memorandum of understanding under which the parties agreed that there is a need "to develop a new, more effective marketing strategy which promotes Southeast Asia as a single destination." In June 2009, the blueprint document was published "Marketing the Southeast Asia Destination Brand: A New Tourism Marketing Strategy and Plan for the ASEAN Region". It shows how the collective resources of the ASEAN destinations can be leveraged to attract significantly more high-yield travellers on multi-destination trips to Southeast Asia. Such regional tourism policies not only focus on tourism development but also offer unique solutions to challenges related to regional transportation networks and infrastructure that hinder the development of tourism.

Weak State of Regional Tourism Activities

It is essential to develop regional tourism brands in order to promote regional tourism. In this regard, joint regional tour packages and touristic routes covering a set of neighbouring OIC countries can be designed. In fact, there is a good example of such an initiative from a group of OIC countries in West Africa, which is called "Regional Project on Sustainable Tourism Development in a Network of Cross-Border Parks and Protected Areas in West Africa" (Box 4.1).

Box 4.1: Regional Project on Sustainable Tourism Development in a Network of Cross-Border Parks and Protected Areas in West Africa

The project for sustainable tourism in West Africa was initiated at the 4th Islamic Conference of Tourism Ministers (ICTM) and at the 16th session of the UNWTO General Assembly, both held in Dakar, Senegal, in March and December 2005, respectively. The study process started in 2008 in the framework of a call for tenders and saw its phases 1 and 2 confirmed at the 18th session of the General Assembly of the World Tourism Organization held in Astana, Kazakhstan, in October 2009. The following ten OIC countries are involved in the project: Benin, Burkina Faso, Gambia, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Sierra Leone. The following objectives were identified at the beginning of the project:

- To reduce poverty among local communities through augmentation of income, an increase in the number of jobs, and the promotion of income-generating activities;
- To ensure the conservation of biological diversity at the sub-regional level;
- To create a network of national and regional parks and cross-border protected areas;
- To professionalize the actors of the tourism sector of the sub-region;
- To promote sustainable tourism and ecotourism; and
- To support the process of sub-regional economic integration based on the rational management of cross-border protected areas.

In particular, the UNWTO has put a special emphasis on developing new tourism routes to promote regional integration and improve regional networks since the development of new tourism routes or re-inventing the existing traditional regional transport routes could play a significant role as they:

a) create networks within a region or linking various regions and/or countries thus maximizing the potential of cooperation as opposed to competition between various players in a region or various regions;

b) create opportunities to generate jobs and business opportunities in less favoured regions and thus their socioeconomic regeneration and development;

c) fight rural desertification and migration to urban areas by creating job and business opportunities notably for youth; and

d) strengthen economic linkages, social cohesion and cultural understanding.

A well-known concrete initiative of the UNWTO in the domain of new tourism routes and regional integration is called the “Silk Road Programme”. So far, the number of participating countries in the programme reached 34 in 2018 and 17 of them are members of the OIC.

Ineffective Regulatory Environment

Well-articulated regulations in the transportation sector may provide a conducive environment for the development of tourism. An ineffective regulative environment in the transportation sector, on the contrary, may constitute a barrier to the take-off of the tourism sector. For instance, in several OIC countries, there are certain strict barriers in the aviation sector including high airport usage taxes/charges, which limit the connectivity of destinations and hampers the development

of international tourism. Moreover, there are some OIC countries that strictly regulate the aviation sector and do not allow for the entrance of new airlines into the market (COMCEC, 2014). In such markets, ticket prices cannot be internationally competitive, and that in turn usually discourage international tourists. In this regard, reviewing the existing regulations in the transportation sector would help to trigger tourist arrivals.

Poor Coordination among Public Authorities and Stakeholders

In many developing countries including several OIC countries, there is a lack of effective coordination between transportation and tourism planning authorities. This usually leads to inefficiencies in the public administration of facilities and services. Such inefficiencies are usually associated with the duplication of efforts by several ministries in terms of tourism destination and transport network planning. Equipping experts at relevant authorities with proper technical know-how and ensuring effective coordination among them may help eliminate such inefficiencies.

Safety and Hygiene Related Concerns

There are concerns regarding tourism safety in some OIC countries. In this context, it is worth mentioning that the safety of tourists is a primary factor for any successful tourism destination and should, therefore, be one of the prime objectives of tourism planning and management. Safety-related problems in the tourism sector, whether real or perceived, exert a negative impact on the reputation of the host countries (COMCEC, 2016). Nevertheless, improved transportation networks would help OIC countries to cope with safety-related issues. For instance, an international airport or railway station that is fully equipped with international safety and security standards would help OIC countries market their touristic destinations in a better way. Nevertheless, this requires ensuring good coordination among national security agencies, and tourism and transport authorities to identify priorities and develop action plans with a view to improving the safety of international tourists.

Since the outbreak of the COVID-19 pandemic, the world tourism market has met with another challenge related to hygiene-related concerns. To prevent the spread of the coronavirus, all OIC countries have taken hygiene-related measures in transportation facilities and networks. This trend is somehow expected to continue in the upcoming years. To this end, the OIC countries should also develop measures with a view to providing effective hygiene-related solutions in transportation hubs and networks.

4.4 Final Remarks and Policy Implications

As a group, the OIC countries have a high potential for the development of a sustainable international tourism sector. This is true given their rich and diverse natural, geographical, historical, and cultural heritage assets. Therefore, international tourism is an important sector that could, if properly planned and managed, play a significant role in the economic development of the OIC countries. This is due not only to their existing and potential tourism resources, but also to the fact that their citizens travel in large numbers around the world for business, leisure, and other purposes. Nevertheless, as SESRIC (2022) showed, the desirable levels of tourism development

and cooperation in many OIC countries, and in the OIC region as a whole, have not yet been achieved.

One of the chief reasons behind this dark picture is the underdeveloped transportation networks and limited cooperation between the tourism and transportation sectors. Moreover, a set of factors discussed in section 4.3 constitute other challenges that the OIC countries need to address in the nexus of the tourism and transportation sectors. It is a fact that the development of a sustainable international tourism sector is heavily dependent on the success of long-term strategies as well as medium to short-term coherent plans and programmes in the transportation sector. In this context, the following set of policy recommendations can be proposed at both the national and the OIC cooperation level to serve as policy guidelines to which the attention of the member countries needs to be drawn.

At the National Level

Ensure coordination between public tourism and transportation authorities: The preparation and promotion of sustainable tourism development should be an integral part of the national development plans and strategies. It is essential to ensure coordination between public tourism and transportation authorities during the preparation of tourism development plans for successful outcomes.

Invest in basic tourism and transportation-related infrastructure: The quality and efficiency of the basic tourism and transportation-related infrastructure and services such as hotels, roads, public amenities, transportation and communication, and tourism information should be improved by taking international standards into account with a view to providing world-class services to visitors and tourists. The growing competition across destinations in the world tourism market has made this point more important than ever.

Strengthen public-private sector cooperation: Tourism is a business and primarily an area for private sector activity. However, its development is heavily dependent on the availability and functionality of public infrastructure including transportation networks, airports, railways, and ports. Thus, efforts should be made to encourage and promote extensive private sector involvement in tourism and transportation network projects by strengthening public-private sector cooperation.

Improve safety, security, and hygiene in the tourism sector through investing in the transportation sector: Efforts should be made to create an environment that ensures safe, secure, and healthy travel of tourists by providing well-established border security and hygiene measures, particularly at airports. Also improving safety and security in road and rail networks and amenities through making required investments would help make tourism destinations in OIC countries more attractive in the eye of international visitors. In addition, the COVID-19 pandemic has increased the importance of hygiene standards in international tourism. To this end, the OIC countries need to further their investments in providing better services for tourists in line with the new COVID-19 and emerging post-COVID-19 health and hygiene protocols and measures.

Review border and customs regulations: International tourists would like to have a pleasant and smooth experience during their journeys, especially at border and customs checkpoints. In this

context, OIC countries are recommended to review their existing rules and regulations to eliminate unnecessary steps and simplify procedures being implemented at border and customs checkpoints for international tourists. Besides, using the state of art technologies and new systems such as e-visa schemes and automated passport control gates would help improve the experience of international visitors while facilitating their mobility.

Diversify tourism products and services by benefiting from alternative transportation networks: Given the increasing competition among destinations, new and diverse tourism products and services should be developed and marketed by taking local values into account and involving local communities. For instance, efforts should be made to improve the potential of ecotourism, not only as a sector with great potential for economic development, especially in remote areas where few other possibilities exist, but also as a significant tool for the conservation of the natural environment. Nevertheless, diversification of tourism products and services should be done in coordination with public transport authorities. For instance, it is impossible to develop ecotourism in a certain region without ensuring the safe and comfortable travel of international visitors through modern and alternative transportation networks.

At the OIC Cooperation Level

Form alliances among stakeholders in the tourism and transportation sectors: The establishment of alliances among tourism and transportation stakeholders in the OIC countries would play a key role in the development of both sectors. In particular, official tourism promotion bodies of the OIC countries (e.g. Destination Management Organizations, Ministries, etc.) should be encouraged to cooperate with a view to strengthening tourism marketing and promotion both at the sub-regional level as well as at the level of the OIC region as a whole. In the development of such promotion campaigns and initiatives at the OIC level, the role of regional transportation networks should be highlighted and the views of national transportation authorities need to be taken into consideration.

Organize capacity building and training programmes at the OIC level: Joint capacity building and training programmes on various aspects of the tourism and transportation sectors should be developed and organised by relevant training institutions of the member countries as well as relevant OIC institutions like SESRIC and ICDT. This also requires the establishment of linkages or networks among relevant training institutions in the member countries to facilitate the exchange of experts and research on tourism and transportation development.

Design long-term strategies and master plans for the development of transportation networks with high tourism potential: Given the limited financial resources that can be invested into transportation infrastructure, OIC countries, as a group, should develop joint, comprehensive, and evidence-based long-term strategies for the development of these networks and infrastructure by taking their tourism potentials into account.

Ease visa policies and develop regional solutions: Existing visa policies and regimes in many OIC countries need to be reviewed with a view to easing the movement of people, especially among OIC countries. Visa facilitation may not only lead to an increased number of intraregional tourists in the OIC group but also make countries/regions more attractive to potential investors. Also, the

development of common visa schemes for a group of OIC countries located in the same region may enhance the development of intraregional tourism as well as deepen regional integration through increased connectivity.

Develop regional tourism activities and transportation routes: OIC countries have several well-preserved natural parks, heritage sites, and protected areas. However, some of these areas start within the boundaries of one country but end in another one. Therefore, to unleash the tourism potential of such areas, OIC countries need to run joint tourism activities and develop transportation routes with a view to branding and marketing these areas. In fact, such joint efforts would also help improve the policy dialogue and cooperation among OIC countries and lead them to benefit from existing national experiences and best practices like in the case of "Regional Project on Sustainable Tourism Development in a Network of Cross-Border Parks and Protected Areas in West Africa".

Improve regional transportation networks: Existing transportation networks among OIC countries are not strong enough to meet the growing demand stemming from residents living in different countries, regions, and continents. Even at the OIC sub-regional level, there are critical shortages of roads, airports, and railways. People living in a certain OIC country sometimes need to first go to a third country in order to visit its neighbouring country due to the lack of a direct connecting route/link. In this context, policies aiming at improving transportation networks are vital for the development of intra-OIC tourism that would pave the way for increased regional integration. Linkages in air, land, rail, and sea transportation should be facilitated and improved in order to ease access from one destination to another within the OIC region.

5. Transportation Challenges for Landlocked Countries

Historically, location and access to the sea, and, thus, to trade routes, have played a significant role in countries' economic performance. In this sense, landlocked countries that lack direct access to open seas have faced special trade and development challenges arising from their landlockedness. Although advancements in rail, land and air transport as well as in information and telecommunications technology have somewhat reduced the advantages of coastal over landlocked countries over time, maritime shipping still plays a central role in global trade and geographic location also remains significant.

A country's location and physical geographical conditions can pose specific disadvantages for transport infrastructure development and the volume of trade and travel. In the case of landlocked countries, geographical isolation creates particular challenges in the development of transport infrastructure and in participation in international trade and travel and increases the difficulties faced by businesses in terms of transport infrastructure and logistics. In this regard, although some landlocked countries, such as Austria, Luxembourg, and Switzerland, are known as wealthy and 'developed' countries, landlockedness is typically considered as an indicator of being more difficult to develop.

Considering the specific economic and infrastructure challenges faced by the 'developing' landlocked countries, a convention to distinguish developed from developing countries has been adopted under the umbrella of the United Nations (UN). The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States (UN-OHRLLS) and the United Nations Conference on Trade and Development (UNCTAD) provides the list of 'landlocked developing countries' (LLDCs), which is "informally accepted by UN member states on geographical grounds."[4] At present, 32 countries belong to the group of LLDCs: 16 are located in Africa, 12 in Asia, 2 in Latin America and 2 in Central and Eastern Europe. Moreover, 17 of the LLDCs are among the 46 Least Developed Countries (LDCs), as classified by the UN as of 2021.

The geographical challenges of LLDCs are often compounded by weak transit-transport infrastructure, inefficient customs operations, and over-dependence on the exports of primary commodities that predominantly requires road transportation. Thus, diversification of export products and markets is a major challenge for LLDCs, rendering them more vulnerable to external shocks that have a significant impact on their economies, trade flows, and supply chains. Against this background, this chapter analyses the impact of landlockedness on the development prospects of landlocked countries from the transportation perspective and outlines, in general

[4] UNCTAD: https://unctad.org/topic/landlocked-developing-countries/list-of-LLDCs
UN-OHRLLS: https://www.un.org/ohrlls/content/list-lldcs

terms, the issues and challenges facing the LLDCs with particular reference to the landlocked OIC countries.

5.1 Landlocked OIC Countries at a Glance

Twelve of the 32 LLDCs around the world are OIC members. They are located in Africa (Burkina Faso, Chad, Mali, Niger, and Uganda) and Asia (Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan). They represent a group of countries that vary widely in total and per capita GDP and in total land area and population density (Table 5.1). As of 2021, their GDP per capita range from a low of less than USD 600 (Niger) to a high of over USD 10,000 (Kazakhstan and Turkmenistan) with an average of around USD 2,150. In population, they range from less than 7 million (Kyrgyzstan and Turkmenistan) to more than 42 million (Uganda). In land area, they range from 83 thousand km^2 (Azerbaijan) to 2.7 million km^2 (Kazakhstan) and in population density, from Kazakhstan with only 7 people per square kilometre to Uganda with more than 210 people per square kilometre. Ranging from less than USD 9 billion (Kyrgyz Republic and Tajikistan) to almost USD 200 billion (Kazakhstan), their GDP, collectively, account for only 6% of total OIC GDP while they make up 13% of total OIC population.

Table 5.1. Basic Information about Landlocked OIC Countries, 2021

		GDP (Billion USD)	GDP per capita (USD)	Income Group[1]	Population (Billion)	Land Area ('000 km^2)	Population Density
AFRICA	**Total**	**108.0**	**851**	**- -**	**126.9**	**4,220**	**30.1**
	Burkina Faso[2]	19.1	887	Low	21.5	274	78.7
	Chad[2]	11.8	697	Low	16.9	1,259	13.4
	Mali[2]	19.2	918	Low	20.9	1,220	17.1
	Niger[2]	15.0	595	Low	25.1	1,267	19.8
	Uganda[2]	43.0	1,012	Low	42.5	201	211.7
ASIA	**Total**	**420.6**	**3,528**	**- -**	**119.2**	**4,676**	**25.5**
	Afghanistan[2]	20.1*	611*	Low	32.9*	652	50.5*
	Azerbaijan	54.6	5,398	Upper Middle	10.1	83	122.4
	Kazakhstan	197.1	10,306	Upper Middle	19.1	2,700	7.1
	Kyrgyz Rep.	8.5	1,283	Lower Middle	6.7	192	34.7
	Tajikistan	8.7	906	Lower Middle	9.7	139	69.6
	Turkmenistan	62.2	10,111	Upper Middle	6.2	470	13.1
	Uzbekistan	69.2	2,002	Lower Middle	34.6	441	78.4
TOTAL		**528.5**	**2,148**	**- -**	**246.1**	**8,896**	**27.7**

Source: IMF, World Economic Outlook Database, October 2022; World Bank, World Development Indicators.

[1] According to the World Bank classification by 2021 GNI per capita.

[2] Classified among the Least Developed Countries.

* Data for the year 2020.

Economically, landlocked OIC countries in Asia are comparatively better off than those in Africa. All except Afghanistan, the Asian landlocked countries are in the middle-income group, with a GNI per capita between $1,086 and $13,205, while their African peers are all in the low-income group, with a GNI per capita of $1,085 or less. Similarly, GDP per capita values average at $3,528 in the Asian group compared to $851 in the African group. Additionally, all of the landlocked OIC countries in Africa are on the UN list of LDCs.

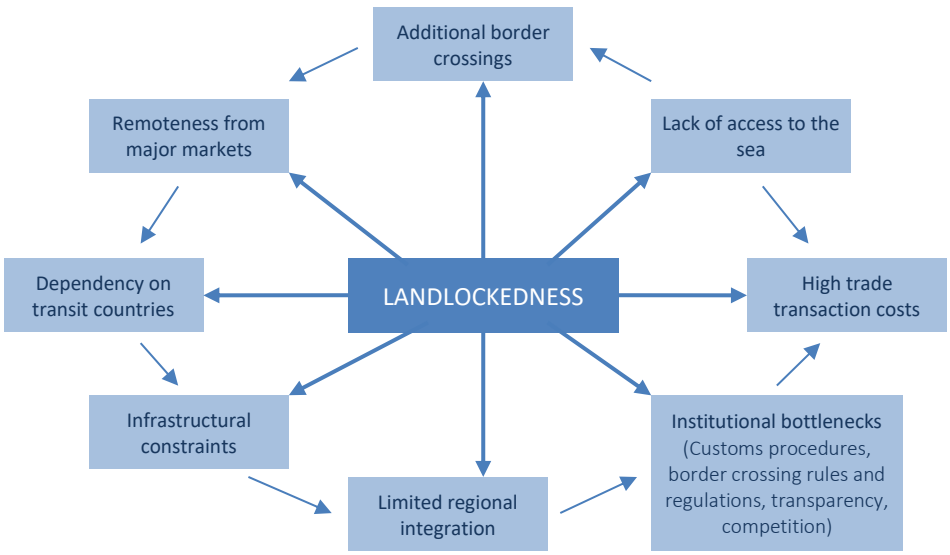
5.2 Transportation Issues and Challenges

Geographical location is an important determinant of socio-economic development. Landlockedness, in particular, is an immutable external factor that substantially affects the development prospects of countries as well as the volume of travel. It can affect both economic and non-economic dimensions of development and these development effects can be transmitted through several channels that include international trade, quality of institutions, and technological innovation as well as the conditions in the transit countries (macroeconomic and political instability, conflicts etc.). In terms of international trade, the backbone of the problems is the transportation issues and challenges posed by landlockedness.

Developmental Challenges of Landlockedness

LLDCs face a multitude of problems and challenges not only in the field of transportation, but also in overall development, and these two areas are closely linked. Assessing the impact of landlockedness on the overall development performance of LLDCs, a report by UN-OHRLLS (2013) reveals that the average LLDC achieves a level of development that is about 22% lower than the average coastal developing country. That is, LLDCs are, on average, 22% less developed than they would be, if they were not landlocked[5]. Moreover, it is found that about half of the average development cost arises from the trade channel, which relies on transportation.

Figure 5.1: Challenges of Being Landlocked



Source: UN-OHRLLS (2013).

Thus, it is obvious that LLDCs face special trade and developmental challenges arising from their landlockedness, which is also recognised at the global settings (Box 5.1). These challenges, which are closely interrelated, include long distances to the nearest seaports, dependency on transit countries for access to the seaports, remoteness from markets, additional border crossings, high

[5] Individual country estimates show that the range of development costs for landlocked OIC countries ranges from 11.2% in Azerbaijan to 30.7% in Chad.

transport and transit costs, and limited regional integration (Figure 5.1). The situation is almost always aggravated when being landlocked coincides with other factors such as harsh geographical landscape and climate, poor physical infrastructure, and an inadequate policy, legal, or institutional environment.

Box 5.1: Landlocked Developing Countries (LLDCs) on the Global Agenda

It has been long and widely recognized that LLDCs suffer from many disadvantages associated with their lack of direct territorial access to maritime services, and their remoteness and isolation from world markets compared to their coastal neighbours. The issues of LLDCs in terms of freedom of transit have been on the international agenda for a long time. For over 100 years, international agreements have been developed to provide freedom of transit for the landlocked countries, including the Barcelona Convention and Statute on Freedom of Transit (1921), the New York Convention on Transit Trade of Landlocked Countries (1965), and the United Nations Convention on the Law of the Sea (UNCLOS) (1982).

Starting from the United Nations Millennium Declaration of September 2000, which recognized their special needs and problems, landlocked developing countries came to attract more global attention. This was further strengthened by the establishment of the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) in 2001. During this period, attempts to address the cost of being landlocked were mainly focused on the development of regional transport infrastructure and on regional and multilateral conventions aiming at ensuring freedom of transit.

The broader issues of LLDCs first came to global attention at the time of the International Ministerial Conference of Landlocked and Transit Developing Countries and Donor Countries and International Financial and Development Institutions on Transit Transport Cooperation, the first ever United Nations Conference on Landlocked Developing Countries, held in Almaty in 2003. The Almaty Programme of Action adopted by the Conference highlighted five priority areas for addressing the trade issues of landlocked countries: (i) Fundamental transit policy issues; (ii) Infrastructure development and maintenance; (iii) International trade and trade facilitation; (iv) International support measures; and (v) Implementation and review. In the immediate aftermath of the Conference, attention focused on infrastructure development.

Although there had been some progress in the implementation of the Almaty Programme of Action, there was felt to be a need for reinvigorated global support for LLDCs. In this regard, the Vienna Programme of Action for the LLDCs for the Decade 2014-2024, was adopted at the Second UN Conference on LLDCs held in Vienna in 2014, with the goal of addressing their special development needs arising from landlockedness, remoteness and geographical constraints in a more coherent manner than before, and so contribute to an enhanced rate of sustainable and inclusive growth and poverty eradication. The priorities for action of the Programme are to address: (i) Fundamental transit policy issues; (ii) Infrastructure development and maintenance; (iii) International trade and trade facilitation; (iv) Regional integration and cooperation; (v) Structural economic transformation; and (vi) Means of implementation. The Programme still gives priority to infrastructure development and maintenance, but includes not only transport infrastructure, but also ICT and energy infrastructure which are crucial for LLDCs to reduce the high trading costs, improve their competitiveness and become fully integrated in the global market.

Source: UN-OHRLLS (2018a), UN-OHRLLS (2018b).

Lack of Access to the Sea and Distance to Port

Entailing myriad challenges with respect to connectivity and transportation, landlockedness is typically seen as a major impediment to international trade. Landlocked countries lack direct coastal access to a high sea and thus also to maritime trade, which constitutes a substantial part of international trade (see Chapter 3). They can only trade with a third country after having their goods transit through a neighbouring country to/from a port. However, these foreign ports often require transportation of the goods over very long distances, which adds significant costs to trade.

Table 5.2: Distance to Ports from Selected Landlocked OIC Countries

	Ports	Range (km)	Mode
Afghanistan	2	1,200–1,600	Road
Azerbaijan	2	800	Rail, road
Burkina Faso	5	1,100–1,900	Rail, road
Chad	2	1,800–1,900	Rail, road
Kyrgyz Rep.	4	4,500–5,200	Rail, road
Mali	6	1,200–1,400	Rail, road
Niger	3	900–1,200	Rail, road
Uganda	2	1,300–1,650	Lake, rail, road
Uzbekistan	3	2,700	Rail, road
Tajikistan	3	1,500–2,500	Rail, road
Turkmenistan	3	4,500	Rail, road

Source: World Bank & UN (2014).

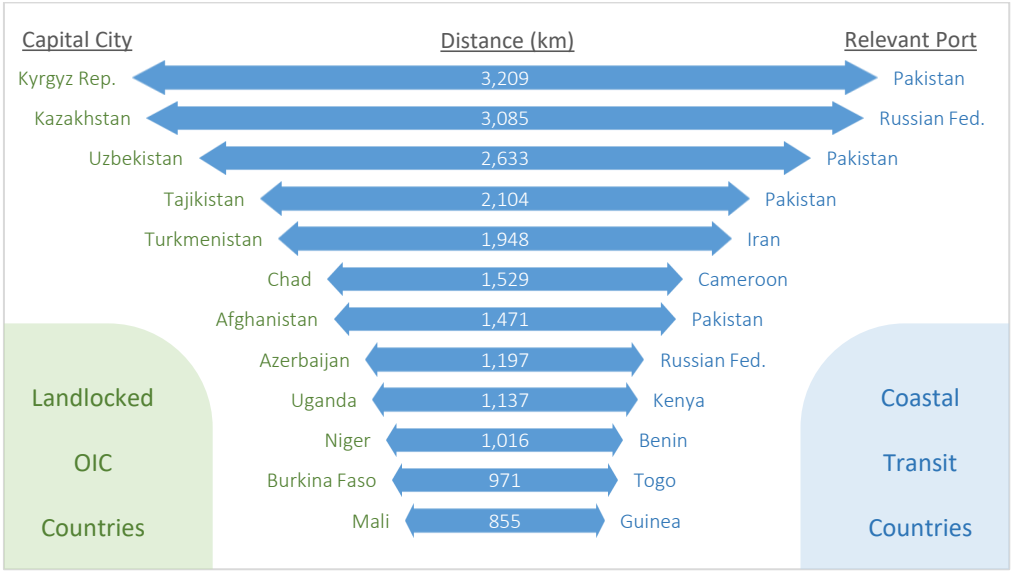
A report by World Bank & UN (2014) shows that, for the landlocked OIC countries, it may take from 800 kilometres to over 5 thousand kilometres to transport from/to various ports by means of different modes of transport (Table 5.2). Similarly, data from the *CERDI-seadistance database*, developed by Bertoli, Goujon, and Santoni (2016), show that the shortest road distance between the capital city and the relevant port for the landlocked OIC countries is estimated to range between 855 km (Mali-Guinea) and 3,209 km (Kyrgyz Republic-Pakistan) (Figure 5.2).

Additional Border Crossings

The problem with transportation from/to foreign ports is not limited to traveling long distances. The challenges associated with additional border crossings pose extra difficulties for the landlocked countries. As Faye et al. (2004) noted;

> *Distance alone, however, cannot explain why landlocked countries are at a disadvantage compared with equally remote, inland regions of large countries. For instance, some regions of China, India and Russia lie further from the coast than many landlocked countries like Azerbaijan and Moldova. While these inland subnational regions indeed face great distance-based cost disadvantages relative to their maritime counterparts, they do not have to face the challenges of border crossing.* (p.32)

Figure 5.2: Shortest Road Distance between Capital City and Relevant Port for Landlocked OIC Countries



Source: SESRIC staff compilation based on Bertoli S., Goujon M., Santoni O. (2017). The CERDI-seadistance database V1.1 [Data set]. Zenodo. https://doi.org/10.5281/zenodo.240493.

Having to cross borders adds substantial portions to the overall transportation costs and it takes significant time as well. It is obvious that LLDCs, compared to many other countries, are faced with relatively more costly hurdles associated with border-crossing issues concerning the procedures and documentation, time and delays, and customs officials. The primary obstacles that occur at road border crossings usually have their origin in poor infrastructure and facilities at border-crossing points, the inadequate provision of border services and border-crossing procedures, and insufficient and poorly trained border officials (ILO, 2006). Additionally, complicated policies concerning visas and customs documentation, issues at the physical crossing of national boundaries due to national procedures, and other consequent reasons evolving around cumbersome customs controls such as congestion and queues and unofficial payments have a substantial impact. Such non-physical, "soft" barriers all adversely affect international trade of LLDCs.[6]

Thus, high transport costs caused by infrastructure deficiencies, delays, fees, or procedures at border crossings make the land leg of the shipping of goods from/to landlocked countries very costly. This, in most cases, oblige the landlocked country to maintain high levels of inventory (UNECE, 2002). Indeed, inefficient border crossings, which can cause goods to be held up for days or weeks, mean that the goods might be damaged, stolen, spoiled, or simply delayed for an uncertain period and, therefore, traders have to keep inventory of perhaps more goods than necessary as a precaution.

[6] Some analyses find that removing these barriers would have a greater impact on economic growth and competitiveness than removing tariffs (World Economic Forum, 2013).

The difficulties in border crossings get even worse when the landlocked countries are surrounded by other landlocked countries. A distinct example is Uzbekistan, which is not only a landlocked country, but also a so-called "double-landlocked" country. It is the only LLDC surrounded by countries that are themselves landlocked (Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan), requiring the crossing of at least two national borders to reach high seas. This entails even higher transport costs and more difficulties in importing and exporting.

Dependency on Transit Countries

Landlocked countries' dependency on one or more transit countries implies additional vulnerabilities to them. Neighbouring countries, with their own economic, political, military, and transport agenda, often have little interest in making the flow of goods across their borders easy for the landlocked countries (UNECE, 2002). In this context, the conditions in and the relationship with the transit countries have a significant role in determining the health of the transit trade. Faye et al. (2004) discussed four types of dependence on transit neighbours, which combine to yield different sets of challenges and priorities in each landlocked country:

- Dependence on neighbours' infrastructure: Landlocked countries are completely dependent on their transit neighbours' infrastructure to transport their goods to port. This infrastructure can be weak for many reasons, imposing direct costs on trade passing through a transit country. In addition, domestic investment of landlocked countries in transport infrastructure depends entirely for its success on the presence of comparable infrastructure in the neighbouring countries along the transit routes or corridors.
- Dependence on sound cross-border political relations: The nature of relations with neighbouring countries also have a direct impact on transport decisions and the development of trade. If a landlocked country and its transit neighbour are in conflict, either military or diplomatic, the transit neighbour can easily block borders or adopt regulatory impediments to trade. Therefore, landlocked countries depend on strong political relations with transit countries.
- Dependence on neighbours' peace and stability: Even when relations with transit neighbours are good and the core transit infrastructure is sound, a landlocked country still must rely on peace and stability within the transit country. When transit countries suffer from civil war, transit routes can be damaged or closed, which often requires a rerouting of major trade corridors or, in the worst case, a stoppage of transit.
- Dependence on neighbours' administrative practices: Administrative burdens associated with border crossings often add the greatest amount to shipping costs. A host of direct transit and customs charges as well as burdensome paperwork and bureaucratic procedures are costly to deal with, cause long delays, and place a high administrative burden on shippers.

It is obvious that LLDCs are completely dependent on their transit neighbours – through a wide range of factors – to transport their goods from/to a port. Like most other LLDCs, landlocked OIC countries have transit neighbours that are themselves developing countries or even LDCs, often with broadly similar economic structure and hampered by similar scarcities of resources. The weak infrastructure and subpar customs and administrative systems in their transit countries cannot

offer an efficient transportation system for the OIC-LLDCs to connect to global markets, which further complicates the trade challenges they face.

Inadequate Transport Infrastructure

Ensuring connectivity of their economies to global markets is a critical challenge for the LLDCs, and it requires establishing and maintaining transport linkages outside the country, as they are completely dependent on the physical and trade infrastructure of transit countries. Nevertheless, this connectivity depends not only on the transit infrastructure, but also on the domestic one. The LLDCs generally have challenges in their own domestic transport infrastructure that are usually rooted in the availability dimension, but are also significantly related to other dimensions such as quality, efficiency, affordability, and sustainability.

> *"We note that some progress has been made by landlocked developing and transit countries in the area of transit transport infrastructure development and acknowledge that despite the improvement, physical infrastructure in road transport, rail transport, ports, inland waterways, pipelines, air transport is still inadequate and missing links are a major problem and need to be addressed urgently."*
>
> Astana Ministerial Declaration Adopted at the Ministerial Meeting of Landlocked Developing Countries on Trade and Transport on 17 May 2018 in Astana, Kazakhstan

Road transport is the dominant transport mode in LLDCs, followed by rail, not only for passengers but also for freight, given that the export structure of many LLDCs is highly concentrated in few commodities and agricultural products. Therefore, having adequate and good quality road network is utmost important to provide physical access to markets. However, the LLDCs have relatively poor road network in terms of both density and quality when compared to their transit neighbours, and they lag behind the averages of all developing countries, developed countries, and world (UN-OHRLLS, 2018b). Indeed, available data summarized in Table 5.3 show that

- paved roads constitute only a quarter or less of the total road network in the African OIC-LLDCs and in Afghanistan, while in Central Asian OIC-LLDCs, most of the road network is paved;
- road network density with respect to population is lower in all OIC-LLDCs than the world average as well as the average for developed countries;
- road network density with respect to land area is lower in all OIC-LLDCs except Uganda than the world average, the average for developed countries, and the average for non-OIC developing countries;
- of the African OIC-LLDCs, Chad and Niger do not have operational rail networks, while rail network density in Burkina Faso and Mali –with respect to both population and land area– is far below the global averages;
- having better figures than their African counterparts in rail network availability, the Central Asian OIC-LDCs portray varying performances when compared to the global averages;

- Turkmenistan have a higher rail network intensity with respect to both population and land area than the world average and the average for developed countries, while Kyrgyz Republic and Tajikistan perform comparatively weak in both cases[7].

Table 5.3: Road and Rail Network Availability in the Landlocked OIC Countries[1]

		Paved Roads (%)	Road Network Density (as per population)[2]	Road Network Density (as per land area)[3]	Rail Network Density (as per population)[4]	Rail Network Density (as per land area)[5]
AFRICA	Burkina Faso	24.6	0.8	5.6	25.5	1.9
	Chad	0.5	2.6	3.2	-	-
	Mali	7.6	4.7	7.3	63.1	0.6
	Niger	23.2	0.9	1.7	-	-
	Uganda	..	3.3	72.8	..	..
ASIA	Afghanistan	26.5	1.2	6.9	..	..
	Azerbaijan	99.5	1.9	23.3	213.5	25.9
	Kazakhstan	87.1	5.1	3.5	878.8	5.9
	Kyrgyz Rep.	..	5.3	17.7	67.1	2.2
	Tajikistan	69.5	1.6	10.2	68.1	4.5
	Turkmenistan	..	2.3	2.9	1312.6	16.3
	Uzbekistan	98.7	1.3	9.7	140.9	10.5
	OIC	..	**2.5**	**16.5**	**70.2**	**4.6**
	Non-OIC Developing	..	**4.6**	**33.2**	**100.0**	**7.2**
	Developed	..	**13.8**	**48.7**	**394.4**	**13.5**
	World	..	**5.5**	**33.9**	**136.9**	**8.3**

Source: SESRIC staff compilation based on data from the World Road Statistics (WRS) Datawarehouse of the International Road Federation (IRF) and the World Development Indicators (WDI) online database of the World Bank. Note: (1) Data for the last year available between 2018 and 2020, except for railway network density for Mali that belongs to 2002. (2) Road Length (km) per 1,000 people. (3) Road Length (km) per 100 km^2 of Land Area. (4) Rail Length (km) per 1,000,000 people. (5) Rail Length (km) per 1,000 km^2 of Land Area.

Considering that transportation constitutes the backbone of logistics services, the general quality of the logistics sector –an important constituent of connectivity– provides meaningful insights into the quantity and quality of transport infrastructure. Unlike the indictors of transport density, a subjective indicator of transport infrastructure is provided in the Logistics Performance Index (LPI) of the World Bank. The LPI is based on perceptions of logistics professionals regarding the six characteristics of logistics performance, one of which is the 'quality of trade and transport infrastructure' (see Box 2.5 above).

Table 5.4 provides a comparison of the average LPI scores of landlocked and coastal countries for different groups of countries. It shows that, between 2007 and 2018 (first and last year for which LPI was measured), landlocked OIC countries experienced a larger increase in LPI score (0.36 pts) as compared to the other groups in comparison. This is also true for the transportation component, where the improvement was as high as 0.44 points, indicating that landlocked OIC countries

[7] Central Asia benefits from an extensive and relatively well-maintained legacy rail network from the former Soviet Union. Yet, the level of development in rail transport varies across Central Asia. Turkmenistan completed the consolidation of its national railway network into a single system in 2006, Uzbekistan only did so in 2018, while Tajikistan and the Kyrgyz Republic still do not have a fully-fledged national railway network (WTO, 2021).

improved their logistics and transportation infrastructure to a larger extent than both coastal countries and other landlocked countries over the period under consideration. Despite this progress, however, they still had the lowest scores in both overall LPI and infrastructure among the groups compared in 2018. In particular, the gap with coastal countries was more remarkable.

Table 5.4: Average Logistics Performance Index (LPI) Scores

	OIC Countries				Non-OIC Developing Countries				Developed Countries			
	Landlocked		*Coastal*		*Landlocked*		*Coastal*		*Landlocked*		*Coastal*	
	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018	2007	2018
LPI	2.09	2.45	2.55	2.64	2.32	2.54	2.56	2.72	3.53	3.65	3.65	3.65
Selected LPI components:												
Infrastructure	1.83	2.27	2.38	2.50	2.10	2.29	2.37	2.50	3.55	3.66	3.61	3.67
Shipments	2.11	2.44	2.51	2.72	2.35	2.58	2.60	2.72	3.36	3.52	3.54	3.41
Logistics	2.06	2.38	2.53	2.54	2.25	2.48	2.52	2.66	3.47	3.73	3.65	3.65
Timeliness	2.57	2.85	2.99	3.01	2.81	2.95	2.98	3.11	3.95	3.93	3.61	3.67
Customs	1.97	2.24	2.37	2.41	2.15	2.39	2.38	2.52	3.38	3.39	3.42	3.50

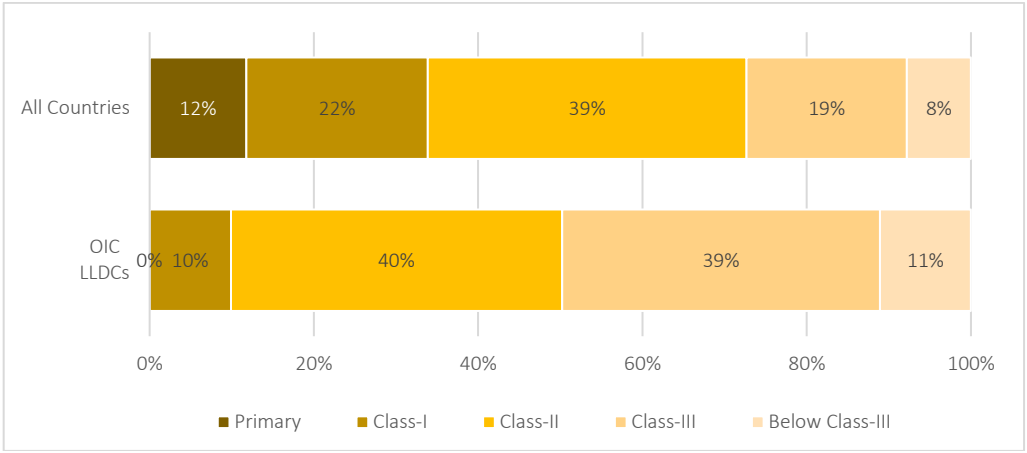
Source: SESRIC staff compilation based on World Bank WDI database.
Notes: The LPI ranges on a scale of 1 (low) to 5 (high). *See Box 2.5 above for further details*

This observation applies not only to transport infrastructure but also to the services that operate over it. As in the case of infrastructure, the average scores in the other LPI components, including ease of shipments, logistics quality, timeliness of deliveries, and efficiency of customs, were also lowest in landlocked OIC countries as compared to the other groups of comparison. Overall, there is strong evidence that landlocked OIC countries remain at logistics disadvantage when compared to their transit neighbouring countries as well as other landlocked countries.

Poor Regional Connectivity

A major challenge relevant to inadequate transportation infrastructure is the connectivity with regional transportation networks, considering that LLDCs are highly dependent on regional integration for their connectivity with the world. Concerted efforts are ongoing to improve road infrastructure mainly through regional initiatives, such as the Asian Highway Network and Trans-African Highway. In Asia, the Asian Highway Network, consisting of 143,000 km of roads running across 32 countries, plays a key role in fostering coordinated development of regional roads and connect many LLDCs to internationally recognized transport networks. All the landlocked OIC countries in Asia are part of this network, about 19% of which is in their territories. The proportion of the network that falls in Class III or better is estimated at 92%, with 8% of the network not yet meeting the minimum desirable standards. Class II type roads have the highest share (39%) and those of Class III are less than 20%. By comparison, in the OIC-LLDCs, despite the progress made in the development and upgrading of the network, a large part of this network in these countries is still at the standard of Class III (39%) – as much as Class II (40%) – with 11% below the minimum standard of Class III (Figure 5.3).

Figure 5.3: Status of the Asian Highway Network by Road Type



Source: SESRIC staff compilation based on UNESCAP, Asian Highway Database. Individual country data varies by year, some dating back to 2010.

In Africa, the Trans-African Highway (TAH), with a total length of 54,120 km distributed along ten routes (Map 5.1), is crucial for the connectivity of LLDCs in the continent. It is meant to provide direct routes between capital cities and provide connectivity to seaports for African landlocked countries. However, according to a report by UN-OHRLLS (2018b), it is also characterized by missing links that are yet to be completed and poor maintenance in some key segments (see Box 5.2). Moreover, the percentage of paved roads is still low in sub-Saharan Africa, where most of the LLDCs are located (see Table 5.3 above). It is estimated that between 60,000 and 100,000 km of regional roads are required to provide a meaningful level of continental connectivity.

With regard to railway infrastructure; missing links, ageing tracks, and inadequate maintenance characterize railway networks in LLDCs. Under the framework of the Intergovernmental Agreement on the Trans-Asian Railway Network and Program for Infrastructure Development in Africa (PIDA), projects have been commissioned to revitalize and upgrade railway networks in both regions (UN-OHRLLS, 2022). The Asian LLDCs have had the opportunity to improve their connectivity with their neighbours and transit countries under the framework of the Intergovernmental Agreement on the Trans-Asian Railway Network, which run across 28 member countries of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)[8]. However, despite the progress made in improving the railway network, closing of the missing links remains as a critical issue, as highlighted by the ESCAP note by the Secretariat on 'Building the missing links in the Trans-Asian Railway network' in 2017:

[8] All the seven landlocked OIC countries in Asia are ESCAP members. Regarding participation to the Intergovernmental Agreement on the Trans-Asian Railway Network, Tajikistan, Turkmenistan, and Uzbekistan are among the 21 parties to the Agreement, while Azerbaijan and Kazakhstan are signatory states as of December 25, 2022.

Box 5.2: Projects to Improve Connectivity within African Road Networks

During the 18th ordinary session of Summit of the African Union, held on 23-30 January 2012 in Addis Ababa, Ethiopia, African Heads of State and Government adopted the Programme for Infrastructure Development in Africa (PIDA) as strategic framework for regional infrastructure. The PIDA Priority Action Plan (PIDA - PAP) comprises 51 cross-border programmes covering the four sectors transport, energy, and ICT as well as trans-boundary water resources management.

Within this framework, 409 projects have been initiated so far, 37 of which are completed, according to the Virtual PIDA Information Centre[1]. Of these projects in all four sectors, 232 are in the transport sector, mostly on upgrading the existing (200) or constructing new (20) infrastructure, including roads, railways, bridges, ports, airports, border posts, inland container depots, and inland ports & waterways. The landlocked OIC countries in Africa are part of 38 of these projects – roads (17), border post (11), railways (8), and inland ports & waterways (2). Most importantly, the road projects include three projects to close/upgrade missing links on the Trans-African Highway network and another three projects to close missing links on the Dakar-Bamako-Niamey Multimodal Transport Corridor, enabling better connectivity within major African road networks.

Projects to Close/Upgrade Missing Links on African Road Networks in Landlocked OIC Countries

Programme Name	Project Name	Type	Location	Year
Trans-African Highway Programme	TAH6: Ndjamena to Djibouti - Missing Road Links in Chad	New	**Chad**	2013
	TAH3: Tripoli to Cape Town - Missing Road Links	Upgrade	Libya, **Niger,** Nigeria	2013
	TAH2: Algiers to Lagos - Missing Road Links in Niger	Upgrade	**Niger**	2017
Dakar-Bamako-Niamey Multimodal Transport Corridor	Bamako-Niamey Road Missing Links in Mali	New	**Mali**	2013
	Bamako-Niamey Road Missing Links in Niger	New	**Niger**	2013
	Burkina Faso Border-Niamey-Zinder-Chad Border Missing Road Links	New	**Niger**	2013

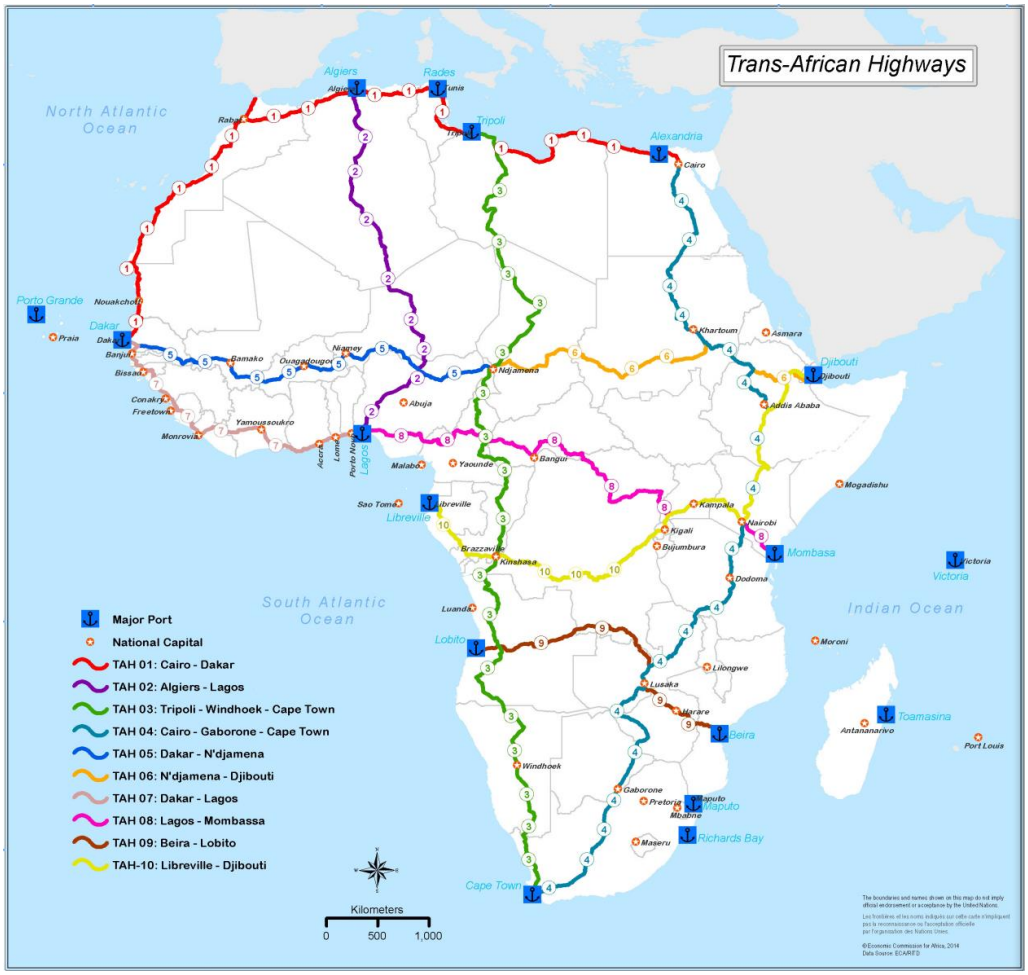
Source: Virtual PIDA Information Centre (https://www.au-pida.org/)

[1] As of December 24, 2022.

A crucial issue for the Trans-Asian Railway is the missing links that still prevent the network from being a solid basis for the development of international intermodal corridors reaching all corners of the region.

In its current configuration, the Trans-Asian Railway network comprises 118,000 km of existing or planned railway tracks that have been selected by member countries for their current or future potential to carry international trade. Of this total, 12,400 km are missing, representing 10.5 per cent of the network. This is the sum of the line sections which have been nominated by member States to be part of the network but have yet to be constructed. The total investment required to put in place these missing links is estimated at $75.6 billion. (ESCAP, 2017)

Map 5.1: Trans-African Highway Network



Source: UN-OHRLLS (2022).

The table of the missing links provided by the Secretariat included, among others, two missing links in the OIC-LLDCs, one in Bangladesh with a distance of 128 km and the other in Kyrgyzstan, with a distance of 357 km. Nevertheless, it is obvious that ensuring seamless rail inter-country connectivity requires completion of all missing links throughout the network. According to ESCAP (2019), countries in the region are, therefore, continuing efforts to construct missing links along the Trans-Asian Railway Network[9], but the levels of required financial investment by far exceeds the capacity of national budgets. Moreover, several countries lack a mature legal and institutional framework needed to effectively attract private investment either in whole or in part through public-private partnerships. In addition to the missing links, the existence of different track gauges, which prevents continued movement of rolling stock across borders, remains one of the major infrastructure connectivity concerns along the network.

[9] For example, the completion of Baku-Tbilisi-Kars railway line in October 2017 opened a new railway transit route to connect countries of Europe with Türkiye, Azerbaijan, Georgia, and Central Asia.

The railways infrastructure in the Africa continent also has similar challenges, as reported by UN-OHRLLS (2018b):

> *The African railway network of 74,775 km has very low density and is mostly in North Africa and Southern Africa. There are over 26,362 km of missing links in the rail network. Part of the network is closed due to war damage, natural disasters, or general neglect and lack of funds. 17 African countries are without railways, five of which are landlocked countries.*

Against this background, it is clear that, compared to Central Asia, railways in LLDCs of Africa and other African regions are shorter and have much more missing links, requiring more effort to connect them to the transit corridors. In this regard, cross-border connectivity with neighbouring and transit countries continues to be a major challenge for the LLDCs, particularly those in Africa, due to the inadequate domestic and regional infrastructure.

Transport and Trade Transaction Costs

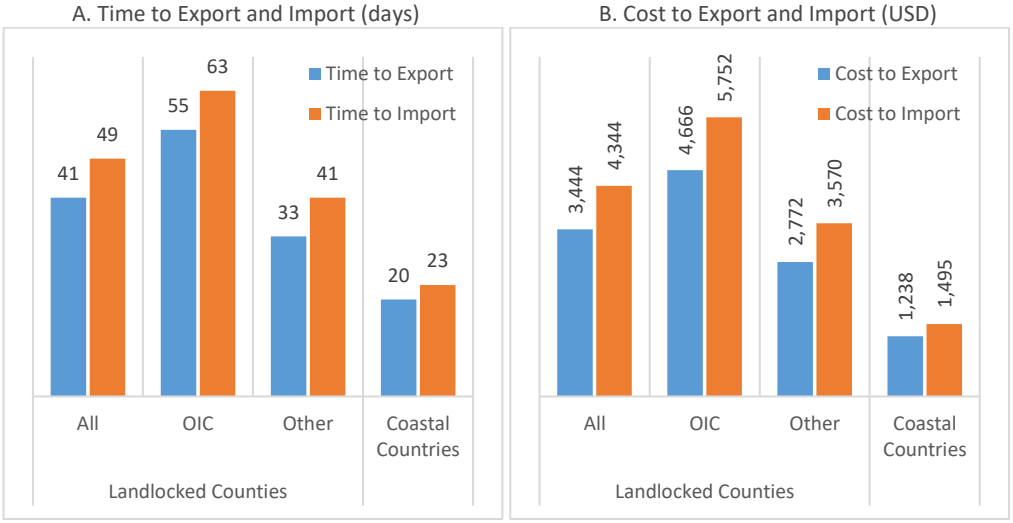
The additional costs incurred to transport from/to distant seaports in transit countries, coupled with the hurdles of border crossings, not only makes landlocked developing countries pay more for freight than their coastal neighbours do, but also makes their exports more expensive. Adding the inadequate transport infrastructure characterized by missing links and poor maintenance and the vulnerabilities resulting from dependency on transit countries, transportation becomes even more costly, unreliable, and unattractive for landlocked countries, making trade more costly and less profitable for the parties involved. Put together, the additional costs mean that shipping a container to its destination to or from an LLDC can add up to between 30-100% of the actual cost of transportation, a significant burden for any society (Earley, 2018).

Transport and trade costs, inflated by a multitude of factors, negatively affects competitiveness of LLDCs and leads to lower trade figures since high transportation costs typically place landlocked countries at a distinct disadvantage relative to their coastal neighbours when competing in global markets. High transportation costs can even eliminate remote landlocked countries from international competition in certain production processes that require high import content and have slight profit margins. In this respect, high transportation costs act as a barrier to trade and hinder the development of manufacturing industries. Consequently, they remain the most important obstacle to the landlocked countries' equitable access to global markets and competition with other countries.

High trade costs and low connectivity have impeded LLDCs' integration into regional and global value chains and markets, with the situation further worsening since the COVID-19 pandemic hit the world in the first quarter of 2020. Disruptions in supply chains, led by disruptions in transportation systems, have negatively affected the movement of goods and services from and to LLDCs that already face higher transit cost and time during normal circumstances. Indeed, earlier World Bank studies showed that, in 2015, LLDCs had to pay almost three times what coastal countries incurred and they required about double the time taken by transit countries to export and import their goods (Figure 5.4). Landlocked OIC countries in particular were in a much more

disadvantaged position, where it took them around two months to export (55 days) or import (63 days) a shipment at a cost of about USD 4,650 and USD 5,750, respectively.

Figure 5.4: Average Time and Cost to Export and Import: Landlocked vs. Coastal Developing Countries, 2015



Source: SESRIC staff compilation based on World Bank's Doing Business Data.

In this regard, high transportation and trade costs continue to isolate many African and Asian landlocked countries and prevent them from realizing their trade potential and reaping the benefits of globalization. Moreover, they are still a major obstacle to achieve sustained and inclusive economic growth, sustainable development, poverty eradication, employment generation, and structural transformation. Efforts to reduce the trade costs by reducing the policy-induced barriers to trade can promote trade flows to some extent, but weak physical infrastructures and logistics services will continue to isolate many landlocked OIC countries from a successful integration into the global trading system.

5.3 Final Remarks and Policy Implications

While each landlocked country faces challenges related to its unique geography, they share the common issue of how to connect to the global economy. Landlockedness, a natural barrier to trade, is not easy to address and, therefore, the LLDCs constantly face challenges with regard to accessibility to international markets. Specific international frameworks such as the Almaty and Vienna Programme of Action as well as the SDGs clearly indicated that connecting LLDCs to global markets should be a priority of all countries globally for the achievement of equitable and sustainable development. Nonetheless, the trade and development challenges of LLDCs have persisted to this day. Transport and trade costs, inflated by a multitude of factors associated with landlockedness, continue to isolate many landlocked countries and prevent them from realizing their trade potential and reaping the benefits of globalization.

LLDCs rely on neighbouring transit countries for connectivity with global markets, and this transit is subject to border crossing processes that play a vital role in facilitation of international road and rail transportation. The delays related to border crossing formalities increase transit time and

adversely affect the competitiveness of landlocked countries compared to coastal countries. This requires cooperation with the transit country and a coordinated approach to infrastructure development.

Although advanced transportation modalities can help to improve this connectivity, such modalities require large amount of investments in "hard" infrastructure at both sides of the border, and landlocked developing countries lack such resources. In most cases, cost of trade from these countries can be reduced to some extent by reducing "soft" barriers to trade through trade facilitating activities, which can support their integration to international markets. However, weak physical infrastructures and logistics services continue to isolate many landlocked OIC countries from a successful integration into the global trading system.

Land transportation is vital to economic development of LLDCs, and its improvement significantly contributes to the economic growth by reducing costs, contributing to the diversification of the economy, and most importantly, linking these countries to transport corridors. Improvement of land transportation provides new opportunities for export-oriented production as well as new trade partners and reduces dependency in this regard. However, road and rail infrastructures, in terms of both quantity and quality, as well as logistics performance are still weak in landlocked OIC countries. Therefore, they need to consider improving domestic transportation infrastructure in parallel with international infrastructure. Without improved domestic transportation for freight and people, it will be difficult for them to make use of cross-border infrastructure to participate in regional or global value chains. For freight in particular, inland/dry ports or customs clearing centres with appropriate modal (road or rail) access to both domestic and international freight transport could safeguard the efficient movement of goods to and from LLDCs.

Regional transport corridors are particularly important to the landlocked OIC countries in both Asia and Africa, as they often provide the only overland routes to international markets. A corridor investment, however, requires infrastructure development not only in transportation, but also in energy, communication, logistics, and trade, which necessitate huge resources. Countries having small populations or the landlocked LDCs with rather limited financial resources might not justify heavy infrastructure installation on their own merits.

Considering the importance of overland transportation between major markets, as in the case of Central Asian OIC countries in between Europe and China, corridors also provide opportunities for landlocked countries to be transport hubs, enabling them to harness cross-border transit and transportation infrastructure. In addition to improving connectivity in the region, the Trans-Asian Railway Network and the Asian Highway Network are now also adapted into new continental trade networks such as the Belt and Road Initiative of China. With the improvement in transportation infrastructure, both the landlocked countries and the trading countries transiting them can benefit from the initiative, provided that the former is assisted in improving the infrastructure through the provision of finance, expertise, and construction services. It is critically important, however, that landlocked countries need to strike a delicate balance between the debt burden they may incur within the scope of transit infrastructure development and the benefits they expect to bring to their economies.

Closing the infrastructure gap in the LLDCs will require enhanced resources not only from the public sector, but also from private sector and international development partners, while efforts to make better use of existing scarce resources are also of vital importance. Given that many LLDCs lack the opportunity to raise more fiscal revenues in order to help meet their infrastructure gap, harnessing public-private partnership (P-PP) modalities could be a viable alternative. Nevertheless, mobilizing private sources of financing in LLDCs is not an easy task as commercial lenders tend to engage in projects that they perceive as 'bankable'. Therefore, it is important for LLDCs, on the one hand, to create an encouraging context where the legal and regulatory environment is favourable to P-PPs and, on the other hand, to exert efforts for attracting finance from development financial institutions to the P-PP projects.

Efforts to tackle the challenges of LLDCs cannot be made possible without clear and frequent communication and agreement with their neighbouring countries. It is of clear importance that LLDCs establish and maintain effective communication channels to neighbouring countries with regard to trade facilitation. It is possible to mitigate the challenges and facilitate trade and transportation through good relationships, communication and trust-building with transit countries. Concluding bilateral agreements between landlocked and transit countries and participating actively in regional and international agreements and initiatives are also of paramount importance to promote cross-border cooperation and harmonization of trade-related policies and, thus, to ensure smooth transit trade.

REFERENCES

Chapter One References

Arup. (2022). *İstanbul Sürdürülebilir Kentsel Hareketlilik Planı SKHP*.

Banister, D. & Berechman, Y. (2001). Transport investment and the promotion of economic growth. *Journal of Transport Geography*, Vol. 9, Issue 3, pp. 209-218.

Boehm, S., Jeffery, L., Levin, K., Hecke, J., Schumer, C., Fyson, C., Majid, A., Jaeger, J., Nilsson, A., Naimoli, S., Thwaites, J., Cassidy, E., Lebling, K., Sims, M., Waite, R., Wilson, R., Castellanos, S., Singh, N., Lee, A., & Geiges, A. (2022). *State of Climate Action 2022*. https://doi.org/https://doi.org/10.46830/wrirpt.22.00028

Bruinsma, F. R., Rienstra, S. A., & Rietveld, P. (1997). Economic Impacts of the Construction of a Transport Corridor: A Multi-level and Multiapproach Case Study for the Construction of the A1 Highway in the Netherlands, *Regional Studies*, 31:4, 391-402.

Calderón, C., Moral-Benito, E., & Servén, L. (2015). Is infrastructure capital productive? A dynamic heterogeneous approach. *Journal of Applied Econometrics*, *30*(2), 177-198.

Eddington, R. (2006). The Eddington Transport Study-The case for action-Sir Rod Eddington's advice to Government-December 2006.

HLAG-ST. (2016). *Mobilizing Sustainable Transport for Development*. https://doi.org/10.18356/2c1884f4-en

IEA. (2021). *Greenhouse Gas Emissions from Energy Data Explorer – Data Tools*. https://www.iea.org/data-and-statistics/data-tools/greenhouse-gas-emissions-from-energy-data-explorer

IISD. (2019). The road to sustainable transportation. *EPJ Web of Conferences*, 19. https://doi.org/10.1051/epjconf/201714800006

Leung, J. (2006). A literature review of theory and evidence in transportation and economic growth. Paper presented to the New Zealand Association of Economists Conference. Wellington.

Litman, T. (2022). Evaluating Transportation Land Use Impacts: Considering the Impacts, Benefits and Costs of Different Land Use Development Patterns. *Victoria Transport Policy Institute*, 1(4), 9–16.

New Zealand Ministry of Transport (NZMT, 2014). Contribution of transport to economic development: International literature review with New Zealand perspectives

New Zealand Ministry of Transport (NZMT, 2016). Contribution of transport to economic development: Economic development and transport project, Summary report, March 2016.

OECD. (2016). The economic consequences of air pollution. In *Policy highlights*. https://doi.org/10.1016/0013-9327(78)90018-6

Oliva, P., Alexianu, M., & Nasir, R. (2019). Suffocating prosperity: Air pollution and economic growth in developing countries. International Growth Centre, December, 1–9. https://www.theigc.org/wp-content/uploads/2019/12/IGCJ7753-IGC-Pollution-WEB_.pdf

Polyzos, S. & Tsiotas, D. (2020). The contribution of transport infrastructures to the economic and regional development. T*heoretical and Empirical Researches in Urban Management*, Vol. 15, No. 1 (February 2020), pp. 5-23.

SACTRA (1999). Transport and the economy: full report. Last accessed on November 17, 2022 from: https://webarchive.nationalarchives.gov.uk/ukgwa/20050304041634/http:/www.dft.gov.uk/stellent/groups/dft_econappr/documents/pdf/dft_econappr_pdf_022512.pdf

SESRIC. (2021). *OIC Environment Report 2021*.

SLOCAT. (2019). *Sustainable Transport: A Critical Driver to Achieve the Sustainable Development Goals*. http://slocat.net/

Sustainable Mobility for All. (2019). *Global Roadmap of Action toward Sustainable Mobility*. https://www.ptonline.com/articles/how-to-get-better-mfi-results

UN (2016). Mobilizing Sustainable Transportation for Development, Last accessed on August 29, 2017 from: https://sustainabledevelopment.un.org/content/documents/2375Mobilizing%20Sustainable%20Transport.pdf

UN-Habitat, UNEP, & SLoCaT. (2015). *Analysis of the Transport Relevance of Each of the 17 SDGs*. September, 1–20.

United Nations. (2021). *Sustainable Transport, Sustainable Development*. https://doi.org/10.18356/9789210010788

WHO. (2018). *Global Status Report on Road Safety 2018*.

World Bank. (2022). *Guide To Integrating Safety Into Road Design*.

Chapter Two References

Airports Council International (ACI). (2022). Retrieved from https://aci.aero/2022/04/11/the-top-10-busiest-airports-in-the-world-revealed/

COMCEC. (2016). Improving Road Safety in the OIC Member Countries. COMCEC Coordination Office, Ankara.

S&P Global Market Intelligence. (2016). Retrieved from https://www.spglobal.com/marketintelligence/en/mi/country-industry-forecasting.html?id=10659115737

UNCTAD. (2021). *Review of Maritime Transport 2021: Challenges faced by seafarers in view of the COVID-19 crisis*. Retrieved from https://unctad.org/system/files/official-document/rmt2021_en_0.pdf

United Arab Emirates Government Portal. (n.a.) Information and services. Justice, safety and the law: Road Safety. Last accessed on June 13, 2023 from https://u.ae/en/information-and-services/justice-safety-and-the-law/road-safety

WHO Results Report, 2022. Country Story. Last accessed on June 13, 2023 from https://www.who.int/about/accountability/results/who-results-report-2020-mtr/country-story/2020/turning-the-tide-against-road-traffic-accidents

Chapter Three References

Anderson, J. E. and D. Marcouiller (2002). "Trade, Insecurity and Home Bias: An Empirical Investigation", *Review of Economics and Statistics*, 84 (2), 345-52.

Arvis, J-F, Y. Duval, B. Shepherd and C. Utoktham (2012). "Trade Costs in the Developing World: 1995 – 2010", *ARTNeT Working Paper Series* No. 121.

Bagci, K. (2014). "Trade Costs and Intra-OIC Trade: What are the Linkages?", *Journal of Economic Cooperation and Development,* 35, 4 (2014), 187-220.

Blonigen, B. and W. Wilson (2008). "Port Efficiency and Trade Flows", *Review of International Economics* 16(1), 21-36.

Blonigen, B.B. and W.W. Wilson (2008). "Port Efficiency and Trade Flows." *Review of International Economics*, 16 (1): 21–36.

Celebi, D., Ojala, L. and Kauppila, J. (2015). "Drivers of Logistics Performance, A Case Study of Turkey", *ITF/OECD, Corporate Partnership Board Report.*

De Sousa, J. (2012). "The Currency Union Effect on Trade is Decreasing over Time", *Economics Letters*, 117(3), 917-920.

Federico, G. and A. Tena-Junguito (2016). "World trade, 1800-2015," VoxEU Article published on 07 February 2016 at http://voxeu.org/article/world-trade-1800-2015.

Freund, C. and N. Rocha (2010). "What Constrains Africa's Exports?", *Policy Research Working Paper Series* 5184, The World Bank.

Herrero, A. G. and J. Xu (2016). "China's Belt and Road initiative: can Europe expect trade gains?", *Bruegel Working Paper*, Issue 5-2016.

Hummels, D. (2001). "Time as a Trade Barrier", Global Trade Analysis Project Working Paper No. 18.

Hummels, D. (2007). "Transportation Costs and International Trade in the Second Era of Globalization." *Journal of Economic Perspectives*, 21(3): 131-154.

Hummels, D., Lugovskyy, V. (2006). "Are matched partner trade statistics a usable measure of transportation costs?" *Review of International Economics*, 14(1): 69-86.

IATA (2021). Economics' Chart of the Week, 28 May 2021. *https://www.iata.org/en/iata-repository/publications/economic-reports/competitive-advantage-of-air-cargo-not-only-speed-but-also-price/*

ITF-OECD (2016). "Capacity to Grow: Transport Infrastructure Needs for Future Trade Growth." *International Transport Forum Policy Papers*, No. 19, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5jlwvz8jlpzp-en*.

ITF-OECD (2017). *ITF Transport Outlook 2017*, OECD Publishing, Paris. *http://dx.doi.org/10.1787/9789282108000-en.*

Korinek, J. and P. Sourdin (2009). "Clarifying Trade Costs: Maritime Transport and its Effect on Agricultural Trade", *OECD Trade Policy Papers*, No. 92, OECD Publishing, Paris.

Korinek, J. and P. Sourdin (2011). "To What Extent Are High-Quality Logistics Services Trade Facilitating?", *OECD Trade Policy Working Papers*, No. 108.

Limão, N. and A.J. Venables (2001). "Infrastructure, Geographical Disadvantage, Transport Costs and Trade." *World Bank Economic Review*, 15: 451–79.

Moïse, E. and F. Le Bris (2013). "Trade Costs: What Have We Learned? A Synthesis Report." OECD Trade Policy Paper No. 150, TAD/TC/WP(2013)3/FINAL. OECD Publishing, Paris.

Oxford Economics (2013). *The Economic Value of International Connectivity*, A report for Transport for London, April 2013.

Portugal-Perez, A. and J.S. Wilson (2012). "Export Performance and Trade Facilitation Reform: Hard and Soft Infrastructure", *World Development*, Elsevier, Vol. 40(7), pages 1295-1307.

SESRIC (2017). *OIC Economic Outlook 2017 – Industrial Development for Structural Transformation*, Ankara.

SESRIC (2022). *OIC Economic Outlook 2022 – Achieving Sustainable and Resilient Recovery Post COVID-19 Pandemic*, Ankara.

Shepherd, B. and J.S. Wilson (2006). "Road Infrastructure in Europe and Central Asia: Does Network Quality Affect Trade?", *Policy Research Working Paper Series* 4104, The World Bank.

UNCTAD (2022). *Review of Maritime Transport 2022*. Geneva: United Nations Conference on Trade and Development.

UNCTAD (2021). *Review of Maritime Transport 2021*. Geneva: United Nations Conference on Trade and Development.

UNCTAD (2020). *Review of Maritime Transport 2020*. Geneva: United Nations Conference on Trade and Development.

World Bank & UN (2014). *Improving Trade and Transport for Landlocked Developing Countries. A Ten-Year Review.* World Bank-United Nations report in preparation for the 2nd United Nations Conference on Landlocked Developing Countries (LLDCs).

World Bank (2012). *Africa Can Help Feed Africa, Removing barriers to regional trade in food staples,* Poverty Reduction and Economic Management Africa, The World Bank.

World Bank (2014). *Trade and Transport Corridor Management Toolkit*. Authored by Kunaka, C. and R. Carruthers. Washington, DC: World Bank.

Chapter Four References

Aradhyula, S. and Tronstad,R. (2003). "Does Tourism Promote Cross-Border Trade?", *American Journal of Agricultural Economics*, 85(3), pp. 569-579.

COMCEC (2014). *Developing Air Linkages to Sustain Tourism among the OIC Member States*, Ankara.

COMCEC (2016). *Improving Road Safety in the OIC Member States*, Ankara

Ghimire, K. (2001), "Regional Tourism and South–South Economic Cooperation", *The Geographical Journal.* 167(2), pp. 99–110.

IATA (2021a). Industry Statistics Fact Sheet.

IATA (2021b), Losses Reduce but Challenges Continue – Cumulative $201 Billion Losses For 2020-2022.

Mammadov, R. (2012). The Importance of Transportation in Tourism Sector, 7th Silk Road International Conference "Challenges and Opportunities of Sustainable Economic Development in Eurasian Countries", May 24, 2012 – May 26, 2012. Available at SSRN: https://ssrn.com/abstract=2231334

OECD (2020). Evaluating the Initial Impact of COVID-19 Containment Measures on Economic Activity. Version 14 April 2020.

Polyzos S. and Tsiotas D. (2020). "The Contribution of Transport Infrastructures to the Economic and Regional Development: A Review of the Conceptual Framework". *Theoretical and Empirical Researches in Urban Management*, Volume 15 Issue 1.

SESRIC (2014). *OIC Economic Outlook 2014*, Ankara.

SESRIC (2016a). *State of Transportation in D8 Countries*, Ankara.

SESRIC (2016b). Transportation Networks in the OIC Member Countries: Impact on Trade and Tourism, *OIC Outlook Series*, Ankara.

SESRIC (2021). *OIC Economic Outlook: Trade, Transport, and Tourism amidst the COVID-19 Pandemic*, Ankara

SESRIC (2022). *International Tourism in the OIC Countries 2022: Prospects and Challenges amid the COVID-19 Pandemic*, Ankara.

UNCTAD (2017). *Economic Development in Africa Report 2017: Tourism for Transformative and Inclusive Growth*, New York and Geneva.

UNCTAD (2021). *COVID-19 and Tourism: An Update on Assessing the Economic Consequences*, Geneva.

UNWTO (2020). World Tourism Barometer, Vol. 18 Issue 1.

UNWTO and WTTC (2012). *The Impact of Visa Facilitation on Job Creation in the G20 Economies*. Report prepared for the 4th T20 Ministers' Meeting, Mexico, 15-16 May 2012.

WEF (2022). Travel & Tourism Development Index 2021: Rebuilding for a Sustainable and Resilient Future, World Economic Forum.

WTTC (2022). *Travel & Tourism: Economic Impact 2022*.

Chapter Five References

Bertoli S., M. Goujon, O. Santoni (2016). "The CERDI-seadistance database", *Études et Documents*, n° 7, CERDI.

Earley, R. (2018). Transport Challenges and Opportunities for Landlocked Countries for achieving Sustainable Development Goals (SDGs), background paper for the Intergovernmental Eleventh Regional Environmentally Sustainable Transport (EST) Forum in Asia, 2-5 October 2018, Ulaanbaatar, Mongolia.

Faye, M. L., J. W. McArthur , J. D. Sachs & T. Snow (2004). The Challenges Facing Landlocked Developing Countries, *Journal of Human Development*, 5:1, 31-68.

ILO (2006). *Labour and social issues arising from problems of cross-border mobility of international drivers in the road transport sector*. Report for discussion at the Tripartite Meeting

on Labour and Social Issues arising from Problems of Cross-border Mobility of International Drivers in the Road Transport Sector. International Labour Organisation, Geneva.

ESCAP. (2017). Building the missing links in the Trans-Asian Railway Network. Note by the Secretariat, 5th meeting of the ESCAP Working Group on the Trans-Asian Railway Network on Building the missing links in the Trans-Asian Railway network held in Busan, Republic of Korea, 13-14 June 2017, E/ESCAP/TARN/WG(5)/4.

ESCAP. (2019). *Review of Sustainable Transport Connectivity in Asia and the Pacific: Addressing the Challenges for Freight Transport*. United Nations Economic and Social Commission for Asia and the Pacific, Bangkok.

UN-OHRLLS. (2013). *The Development Economics of Landlockedness: Understanding the Development Costs of Being Landlocked*. United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

UN-OHRLLS. (2018a). *Financing Infrastructure in the Transport Sector in Landlocked Developing Countries: Trends, Challenges & Opportunities*. United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

UN-OHRLLS. (2018b). *Achieving the Sustainable Development Goals in Landlocked Developing Countries through Connectivity and Trade Facilitation*. United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

UN-OHRLLS. (2022). *Improving Transport Connectivity for LLDCs and Building Resilient Transport Infrastructure to Support Accelerated Progress Towards the SDGs*. United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

UNECE. (2002). *Landlocked Countries: Opportunities, Challenges, Recommendations*. United Nations Economic Commission for Europe. TRADE/2002/23.

World Bank & UN. (2014). *Improving Trade and Transport for Landlocked Developing Countries. A Ten-Year Review.* World Bank-United Nations report in preparation for the 2nd United Nations Conference on Landlocked Developing Countries (LLDCs).

World Economic Forum. (2013). *Enabling Trade: Valuing Growth Opportunities*. Available at https://www.weforum.org/reports/enabling-trade-valuing-growth-opportunities

WTO. (2021). *Easing Trade Bottlenecks in Landlocked Developing Countries*.

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