Trade facilitation and supply chains in the Arab region in the era of the COVID-19 pandemic

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Background

The COVID-19 outbreak and global spread have had a serious implication on various aspects of life, including trade and transport. The pandemic posed additional new challenges to the smooth flow of trade across borders and have increased pressure on the logistics systems in all countries, with magnified effects on developing countries. The main short-term challenge is to balance out the need for rapid movement of critical goods (medicine and food) while observing additional sanitary control measures, disruption in staff productivity and limitation of human-to-human interactions. The long-term impact of the pandemic is manifested in the changes to global supply chains. Such fundamental changes can bring various trade and environmental opportunities to the scene.

The experience of the past few months did not only prove the failure of logistics, but also the failure of production, global trade rules and the alleged connectedness of the world. All such long-standing pillars of the international trading systems are now being looked at through different lenses.

The world after the pandemic is likely to be different. On the one hand, rethinking globalization is very plausible due to the need to have in place a system that can deliver not only during good times, but also, and more importantly, during difficult times. On the other hand, taking advantage of the crises to secure some national interests against commitments at the global level cannot be ruled out. It is evident that the world after Covid-19 will certainly look different, even if slightly, from the pre-pandemic world. However, what will change, and how it will change, is still unknown. Most important is the impact of possible changes on different regions and countries- which remains to be seen.

While the Arab region is affected by the pandemic and must deal with its consequences, it should look further than just mitigating the negative impact of the outbreak, try to build back better and seize any opportunities that are likely to emerge from the pandemic, particularly in trade and environment.

Exceptional measures were put in place to restrict movement across borders in most Arab countries to stop the spread of the disease during periods of peak transmission. The trade facilitation framework that was put in place under the World Trade Organization (WTO) Trade Facilitation Agreement, to which some Arab countries have adhered, provides important guidelines for countries in their efforts to recover at least part of their trading activities. As such, many countries in the Arab region have implemented trade facilitation measures to support the flow of critical goods and limit the impact of the pandemic on their economic activities. Despite their effectiveness, these measures were aimed for short-term gains. In the post-pandemic era, efforts should aim to build more resilient supply chains that can easily adapt to possible future shocks.

In many sectors, the opportunity to build back better after the pandemic is currently being examined. The current paper argues that integrating environmental protection and emission reduction goals into a rapidly evolving transportation and trade logistics sector is needed to support a more resilient supply chain. This implies better cooperation between multinational companies and national economies to optimize supply chains from the social, economic and environmental perspectives.

The proposed avenues through which enhanced resilience can be achieved include better integration in an increasingly diversified global supply chain and through greener trade logistics operations and arrangements.

I. Trade facilitation measures implemented in the Arab region in response to COVID-19

A. Dematerialization of customs clearance processes

Dematerialization presents a method for trade facilitation that is highly relevant to the context of the global sanitary crisis since it is based on limiting the burden of supporting documentation through the digitalization of customs clearance processes, which limits the need for human interaction. Dematerialization also streamlines processes by consolidating communication platforms among the various entities in charge of certifying, verifying and releasing goods for border crossing. The exchange of information and enhanced communication is supported by technological advancements made available at increasingly declining cost.

1. Communication platforms were consolidated and operationalized to link government entities and stakeholders concerned in the release of goods at border crossings

In Kuwait, an automated connectivity mechanism was launched on electronic customs system platforms to consolidate cooperation among various entities involved in the application of control policies and regulations for land border crossings. The system supports timely and automatic information exchange between the General Administration of Customs and the General Traffic Department of the Ministry of Interior, with support from the Central Agency for Information Technology network. The system, which has been expanding since its launch and currently includes more than 10 government agencies involved in customs releases, has succeeded in replacing physical stamps and seals with electronic approvals.[1] National reporting shows that digital transformation through the dematerialization of customs release processes, as well as remote work modalities, have supported the timely flow of critical imports and exports, while factoring in health and security concerns based on a risk management framework.

2. Trends in the Arab region are for increased digitalization of merchandise verification and customs clearance. The pandemic has accelerated the implementation of technological advances used for such practices

The customs authorities in Jordan launched an electronic movement permit request service that allows clearance companies to expedite the issuance of movement permits to unloading and uploading workers and warehouse officers. This measure was intended to ensure the timely release

1 https://www.customs.gov.kw/News/Index/616.

of merchandise across land, air and sea border customs control and the smooth flow of goods and merchandise to the local market.

In Qatar, and as part of the customs clearance dematerialization, processes were revisited to reduce the number of required documentations. Requests for certificates of origin were replaced with the submission of an original detailed invoice and package lists approved by the Chamber of Commerce and the Qatari embassy or consulate in the concerned country, stating the origin of the goods.

In Morocco, electronic copies of documentation requested for customs clearance were accepted, and power of attorneys were communicated electronically without the need for legalized signatures[2].

Customs authorities in Oman have announced the expansion of electronic services to support administrative tasks without requesting the presence of the merchandise owner or a representative.[3]

B. Simplification of procedures, extending deadlines and relaxing rules

In an attempt to respond to the exigencies of the current situation, many customs control authorities have reverted to relaxing rules by delaying deadlines and extending operating hours.

In Saudi Arabia, an existing initiative that allowed the postponement of custom duties settlement for 30 days was further extended for an additional three months from the date when merchandise is allowed into the country. The initiative is accessible to all importers, based on a bank guarantee. Another measure allows low to medium risk importers to delay customs duty settlements without the need for a bank guarantee, based on an electronic declaration acknowledging the settlement date to be a maximum of 30 days from the day of the clearing process. In Morocco, deadlines for administrative functions that cannot be dematerialized were suspended.[4]

Economic easing was also implemented to provide immediate solutions for emerging COVID-19 related challenges. In Qatar, for example, importers were exempted from settling customs duties in case the merchandise was not sold on the market for a period of six months from the date of release, after which there would be a possibility for re-export without incurring any customs fees.[5] This was implemented to support importers and sustain economic activity during these difficult times. Algeria also applied exceptional measures to facilitate entry of imported goods based on a commitment to settle the customs formalities at a later stage.

2 http://www.douane.gov.ma/web/guest/covid_soutien_entreprises.

3 http://www.customs.gov.om.

4 http://www.douane.gov.ma/web/guest/covid_soutien_entreprises.

5 https://www.customs.gov.qa/Arabic/Media/Pages/NewsDetails.aspx#/C-NewsDetails-ID/171.

In addition, precautionary sanitary control measures imposed on land transport vehicles were relaxed by exempting truck drivers transporting goods from the Gulf Cooperation Council (GCC) countries to Saudi Arabia from stringent controls on sanitary and health conditions. These controls were replaced with an overall checkup of the drivers' general health status (absence of COVID-19 symptoms).

Operating hours in many ports were also extended to make up for the interruptions imposed during periods of confinement to limit the spread of the disease. For example, operating hours at the Shuaiba and Shuwaikh ports in Kuwait were extended to 24 hours per day for all incoming and outcoming merchandise and goods, including on holidays.[6]

C. Exemptions to expedite the clearance of critical goods such as food and medicine

In their efforts to limit the spread of the disease while maintaining normal operations of governmental institutions, customs authorities have put in place extraordinary measures to facilitate the flow of critical traded goods, such as medical supplies, protection equipment and medicine.

In Kuwait, the national customs authorities have prioritized measures to facilitate the timely flow of medical supplies and relief items to the Ministry of Health. A decision was issued by the Council of Ministers to facilitate the movement of trucks, in collaboration with the Ports Authority, the General Administration of Customs and the Ministry of Health.[7] These measures were effective in ensuring timely response while observing the highest safety standards in controlling incoming goods. In Jordan, the authorities instructed concerned government bodies to simplify and speed up clearance procedures for all goods, especially food and medical supplies, as well as facilitate procedures needed to support local market access.

6 https://www.customs.gov.kw/News/Index/618.

7 Website of the Customs Authority: https://www.customs.gov.kw/News/Index/660.

II. Transition from short-term COVID-19 response measures to long-term arrangements

A. Weakness of globalized supply chains as revealed by the pandemic

Developed countries have long relied on *offshoring* most of their sourcing and manufacturing activities to lower wage countries, which has supported mass production of a broad range of consumables and industrial inputs at competitive prices. This trend was reinforced for many years, facilitated by optimized transport logistics and stable international trading conditions. Consequently, locations with lower costs of labour and materials, land and other production factors have become at the centre of almost every supply chain, turning them into reliable global sourcing hubs.

Despite the success of this global model in many ways, global supply chains usually suffer from intrinsic structural weaknesses. These include multistage production models, poor control of upstream functions and longer supply lead times, resulting in heavily outsourced, concentrated and interdependent sourcing, manufacturing and distribution networks. It is becoming obvious that the risks associated with globalized and fragmented supply chains have remained, to a large extent, underestimated and largely ignored.[8]

Enhancing the resilience of supply chains often involves trade-offs that favour agility and responsiveness at the expense of optimized efficiency. Measures taken to enhance supply chain resilience to disruptive risks include, for example, redundancy in inventory, which obviously entails compromises in cost efficiencies.[9]

Nonetheless, and well before the pandemic broke out, many companies have started moving to more regionalized patterns of sourcing and production to avoid increasingly concentrated and interdependent supply chain networks. In doing so, they agreed to absorb additional costs in order to enhance their agility.[10]

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8 Willy Shih (2020). Is it Time to Rethink Globalized Supply Chain? Frontiers Magazine. Available at https://sloanreview.mit.edu/article/is-it-time-to-rethink-globalized-supply-chains/.

9 Chopra, S. & Sodhi, M. (2014). Reducing the Risk of Supply Chain Disruptions. MIT Sloan Management Review, 55(3), pp. 72-80.

10 Gartner (2020). Executive Report Excerpts: Weathering the Storm: Supply Chain Resilience in an Age of Disruption.

It is estimated that the additional costs incurred towards a more diversified supply sources are offset by a more resilient supply chain in the long run.[11]

B. Enhancing the resilience of supply chains

Despite the volatility, uncertainty and complexity brought along by the global crisis, there is an opportunity for the Arab region to achieve better global and regional trade integration. This is mainly the result of global shifts in patterns of production, trade and consumption. Furthermore, governments and businesses need to collaborate to build back better frameworks of production and delivery, which would enhance the resilience of supply chains and the accompanying transport logistics sector.

There are two main tracks to achieve these goals. The first is through better integration in an increasingly diversified global supply chain, while the second is by taking advantage of the opportunity brought along by this pandemic to build a greener trade logistics and transportation landscape, which would in turn contribute to a more sustainable and resilient supply chain.[12]

1. Potential opportunities for Arab countries from changing supply chain configurations

Changing the trade and transport landscape has been recently accelerated by the economic fallout caused by the pandemic. Most multinational enterprises are rethinking the geographical and sectoral organization of their production activities. The aim is to introduce some simplification and diversification to the supply chain to bring manufacturing closer to markets, enhance resilience and reduce reliance on concentrated global manufacturers. Nevertheless, such strategies imply greater costs of production that are mainly associated with higher labour costs.

In trying to find ways to address tradeoffs between market proximity and labour costs, the concept of "nearshoring" or "nearsourcing" is emerging as an interesting alternative to longstanding production and distribution models. This model favours manufacturing locations close to large consumer markets. Arab countries that have been concerned by such changes include the Arab Mediterranean counties to which some European countries have already started relocating parts of their manufacturing activities.

(a) Re-assess production capacities and consolidated linkages to nearby supply chains

The pandemic has resulted in considerable disruptions in many Arab countries. The top four economies in the region are particularly concerned and include Morocco and Tunisia (electrical machinery), Saudi Arabia (chemicals), and the United Arab Emirates (metal and metal products).

11 Willy Shih (2020). Is it Time to Rethink Globalized Supply Chain? Frontiers Magazine. Available at https://sloanreview.mit.edu/article/is-it-time-to-rethink-globalized-supply-chains/.

12 Assessing Arab Economic Integration Chapter 2: How Agricultural Trade Can Enable the Achievement of the SDGs through Further Regional and Global Integration schemes.

Hence, under emerging circumstances, the need for more resilient and better integrated supply chains for enhanced economic recovery in the Arab region seem to have gained greater importance.

There are already some successful experiences from the Arab region indicating potential for linking up parts of the production stages with regional nearby supply chains. These are chiefly concentrated in the automotive and IT sectors.

*Automotive Sector*In pursuing greater efficiency in the automobile manufacturing industry, European production plants have been seeking international relocation of their production activities for over a decade now. The objective is to benefit from lower labour costs and enhanced sourcing efficiency by rearranging the flow in parts and components among the various agents in the automobile sector's value chain.

Regarding the first objective, relocation of labour-intensive activities was undertaken mainly towards countries in North Africa and Central and Eastern Europe, especially to produce wire harnesses, textile products and assembly activities to supply automobile manufacturing plants located in Europe.

As such, the share of relocated jobs in the car components sector from Europe to North African countries, mainly Morocco and Tunisia, over the period 2001-2008, accounted for 28 per cent of the sector's total relocated jobs[13]. The second objective, which is to achieve economies of scale in car component sourcing, was pursued through a diversified network of alternative suppliers located in various countries. The aim is for a greater operational flexibility in coordinating and transferring resources internationally (moving away from the concentration of one source).

This trend addresses the exigencies of the pandemic as well, where manufacturers are increasingly avoiding concentrated sources of supply in favour of more diversified sourcing basis. Therefore, the relocation of production activities is forecast to continue and probably expand under the current situation.

Recently, large automotive manufacturers have explicitly expressed interest in expanding their activities in North Africa. Morocco already integrates a significant share of the automotive manufacturer Groupe PSA Kenitra supply chain, involving over 60 local manufactures. In Egypt, Fiat Chrysler automobiles (FTA) and PSA are producing vehicles either directly or through local manufacturers. Relocation is being facilitated by existing trade agreements between Egypt and Morocco on the one hand, and European countries on the other.[14]

Furthermore, Renault announced its intention to enhance regionalization of its manufacturing processes from 50 per cent to 80 per cent. In that respect, Egypt and Morocco seem to present

13 Lampon, J and Lago-Penas, S. (2013) Factors Behind International Relocation and Changes in Production Geography in the European Automobile Components Industry. SSRN Electronic Journal.

14 OECD, Investment in the MENA region in the time of COVID-19, 2020.

feasible relocation destinations based on their proximity and trade connections with Europe, which allows them to play a greater role in the manufacturing of the company's automotive parts.

Information and Communication Technology

Tunisia is being considered by European countries for Information Technology (IT) nearshoring. Enabling factors include proximity to European IT markets, existing industrial free trade agreements with Europe, reliable infrastructure network and high human capital trained in new-technology skills.

Egypt is improving linkages with global telecommunication supply chains by strengthening its position as a regional IT hub. The country has succeeded in developing its software industry, which is currently specialized in two main areas: translating standard software products of leading brands into Arabic, and comprehensive support to users of standard software in the region. Underlying factors that have supported the identification of Egypt for IT nearshoring include the country's location in the same time zone as Europe, its fiber-optic telecommunications network, with easy access to a very large telecommunications bandwidth, and the skills it has at cost-competitive rates.[15]

(b) Impact of supply chain modifications on trade and transport logistics

Bringing manufacturing activities closer to consumer markets has inevitable impacts on transport logistics requirements. Onshoring and nearshoring are associated with considerable reductions in ton-km volumes. The direct implications include reductions in distances travelled, which in turn reduce both the costs of transport and the volumes of transported merchandise, with implications on capacity requirements. Furthermore, nearshoring and onshoring

Spillover effects of nearshoring to related sectors

Additional benefits for locating production processes include enhancing employment opportunities in developing countries. Contrary to offshoring, which seeks remote manufacturing locations in pursuit of low-wage labour, nearshoring involves shorter travel distances and transit times, which means simpler logistics management procedures and lower transportation costs.

Also, "nearshoring" intuitively involves "nearsourcing", which allows for better control over the quality of the manufactured products, ensures sustainability of the used resources and supports ethical employment, all the while maintaining lower costs of production than offshoring modes of production.

Since it is closer to the market and can respond faster to the market needs, nearshoring can also lead to waste reduction, specially in the downstream supply chain.

A successful example of how shifting from global suppliers to local supply chains can enhance resilience and agility in the face of shocks, such as a global pandemic, is the case of Inditex, a high-end clothing manufacturer and retailer with "closer to markets" manufacturing locations in Morocco, Spain and Portugal. This has permitted the factory to limit impacts of the pandemic on sales compared to other textile factories.

15 UNCTAD (2010). Integrating Developing Countries' SMEs into Global Value Chains. UNCTAD/DIAE/ED/2009/5.

imply changes in the liner shipping landscape, with heavier traffic expected to be concentrated at the level of regional transport networks.

2. Building back better in the trade and transport sector

Disruptions brought about by the pandemic have accelerated and magnified problems that already existed in global supply chains. They have revealed supply chain vulnerabilities and weaknesses that had gone unnoticed for long years, and were the source of considerable challenges facing the reliable and consistent delivery of essential and critical goods in times of uncertainty, notably medical supplies and food.

While the primary objective of improving supply chain resilience targets a greater agility in responding to shocks, it is increasingly recognized that approaches implemented towards enhancing the resilience of supply chains would also support progress in achieving social, economic and climate change targets. As an example, the relocation of production closer to consumer markets, as discussed above, would alleviate demand for transport. As such, nearshoring is typically associated with modal shifts involving the replacement of air freight with land transportation which results in lower GHG emissions.[16]

Furthermore, additional gains in terms of improved economic profitability and social equity are being noted in greener and more resilient supply chains. This is because although all segments of society are impacted by disruptions in the supply of goods, vulnerable population groups are disproportionately affected and hence would benefit the most from enhanced supply chains. Furthermore, empirical evaluations performed in different parts of the world have demonstrated the link between greener and more sustainable supply chain management practices, with increased competitiveness and improved economic performance.[17] Therefore, benefits ensuing from strengthened supply chain resilience would support the three pillars of sustainable development.

(a) Greening supply chains

Green transport and trade logistics should be examined and considered from the perspective of an overall greener supply chain.

The changing landscape of sourcing and trading patterns creates opportunities for greening supply chains since near sourcing and nearshoring involve trading partnerships located in closer geographical locations. This means shorter travel distances, and hence lower emissions from transportation, better control over the sourcing processes, and easier accountability in terms of

16 WEF, Supply Chain Decarbonization: The Role of Logistics in Reducing Supply Chain Carbon Emissions. WEK, Geneva, 2009.

17 Rao, P. and Holt, D., Do green supply chains lead to competitiveness and economic performance?, International Journal of Operations *and* Production Management, vol. 25 No. 9, 2005, pp. 898-916.

abidance with global agreements related to labour conditions, GHG emissions, environmental quality standards and others.

These gains are thought to offset losses incurred by bringing production location closer, which means, in most of the cases, higher production costs and sourcing. Furthermore, the long-standing perception of the great economic savings achieved through offshoring is currently being challenged. An assessment approach based on the total landed costs methodology was implemented to calculate actual costs of manufacturing, storing and transporting goods to consumer markets, factoring in hidden costs associated with sourcing and transport logistics. The costs of CO_2 emissions and other environmental concerns were particularly considered. Results have shown that offshoring production processes results in less than optimal outcomes, driven by lengthy order lead times, stock holding costs and high emissions generated by a variety of transportation modes over long haul distances.[18] This means that offshoring sourcing and production processes might not be as cost effective as they are widely believed to be.

In order to optimize the greening of supply chains, the various stages involving inception, design, manufacturing and distribution of products' entire lifecycle should be taken into consideration. Examples include environmentally compliant storage conditions and suppliers that have demonstrated sustainable procurement processes, among others.

Therefore, the opportunity to enhance climate and environmental efficiency of transport logistics arrangements must be explored in the context of the Arab region by considering shortened transport distances and judicious selection of modes of transport, as well as examining other avenues such as decarbonization, carriers that abide by environmental principles, de-speeding, modal shifts and economies of scale on maritime shipping.

A temporary implication of the stalled economic activity due to the pandemic includes a slowed down environmental degradation and curbed GHG emissions. However, the sustainability of these positive impacts is being questioned. Outcomes of forecasts suggest that in case economic activity resumes according to post-pandemic business and economic models, the climate benefits produced by the pandemic are set to be lost.[19]

(b) Greening transport logistics

Emission reductions in the transport sector are typically pursued through improved energy efficiency and by replacing fossil fuels with less polluting energy resources. Nevertheless, it is increasingly being demonstrated that considerable GHG emission reductions can also be achieved by optimizing logistics arrangements. This is reflected in the International Maritime Organization's (IMO) strategy towards the achievement of GHG emissions targets from international shipping. The

18 Iakovou, E. et al (???) Nearshoring and Offshoring for Global Supply Chains Networks: A Total Landed Cost Perspective.

19 Le Quere, C.et al. (2020). "Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement", Nature Climate Change, pp. 1-7. Available at http://dx.doi.org/10.1038/s41558-0200797-x.

strategy recognizes the role of optimizing trade logistics and transport arrangements towards the achievement of carbon emission cuts.

Consequently, analysis generated in this section will focus on avenues supporting the greening of supply chains and enhancing the resilience in trade logistics delivery through the diversification of transportation modes, de-speeding of vehicles and improving logistics network design. The paper will particularly emphasize the co-benefits generated from both an emissions reduction perspective and enhanced resilience objective. The identified approaches are reviewed and their applicability to the countries of the Arab region examined.

(i) Diversified modes of transport

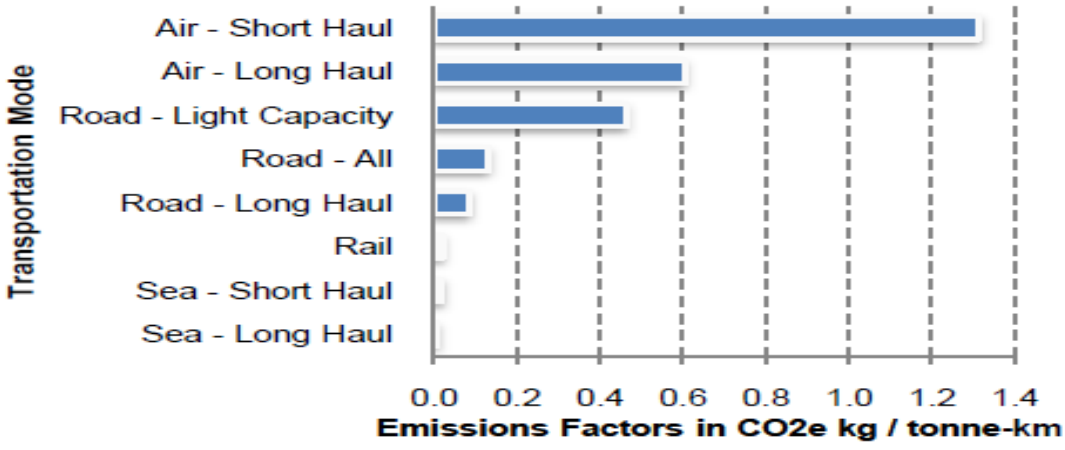
In seeking greater agility and increased resilience to absorb future shocks, business strategies are seeking a more diversified base of suppliers, with less reliance on the "sole supplier" sourcing arrangement. Sourcing from various geographical locations inevitably involves considering various modes of transportation. Nevertheless, in addition to economic and logistics efficiency considerations, countries need to evaluate the environment and climate-related impacts of the considered transport modes from a national development priority perspective, while taking into consideration their global climate and environmental commitments.

In comparing transportation modes over fixed routes, air freight is inevitably the most polluting in terms of the emission of not only CO_2, but also sulphur dioxide (SO_2) and nitrogen oxide (NO), which also contribute to global warming and acid rain.

Also, average CO_2 emissions from rail and waterborne transport are substantially lower than those generated by road transport.

Under the prevailing global conditions and their associated changes in trading patterns, the opportunity is presented to revisit the organization of transportation activities for optimized economic and environmental efficiency and for enhanced resilience. Whenever feasible, rail transportation would need to be considered as a suitable alternative to other more polluting alternatives. The advantages are both of environmental and economic in nature. For example, a quick comparison of sea freight with rail transport shows that while CO_2 emissions from sea freight is lower than that generated from rail transport, the latter generates SO_2 and NO in higher concentrations. Furthermore, travelled distances are usually shorter under the railway transport mode.

The figure below depicts emissions per mode of transport expressed by quantity of CO_2 emitted by ton-km.



Source: World Economic Forum (WEF). (2009). Supply Chain Decarbonization prepared within the framework of the Logistics and Transport Partnership Programme. Available at http://www3.weforum.org/docs/WEF_LT_SupplyChainDecarbonization_Report_2009.pdf.

An analytical research study examined GHG abatement potential for three intermodal switches, including from intercontinental air to ocean freight, from short haul air to road transport and from long distance road freight to rail or waterways. It was found that the greatest abatement potential can be achieved from swapping long haul road transportation for rail or water ways.[20] Furthermore, in the absence of effective railway networks, the use of large highly polluting transport vehicles for the transportation of merchandise is encouraged.

Studies by the United Nations Economic and Social Commission for Western Asia (ESCWA) have highlighted the deficiency in railway coverage in the Arab region, estimated at 7 km per 100,000 people, compared to 42 km per 100,000 in the European Union and 15 km per 100,000 persons as a world average, and which represents a main obstacle to more effective regional trade integration.[21] It was also demonstrated that there is a great opportunity for the development of railway networks in the Arab region.[22]

Some Arab countries have already achieved great strides in that respect. Jordan has been strengthening its railway development strategy to reinforce the country's position as a potential regional trade and transport hub. The country aims to develop a 1,000 km railway network by 2050, deployed along four phases linking up the capital, Amman, to the Aqaba Port, and, at later stages, consolidating interconnectivity with Iraq, Oman and Syria. The aim is to shift a larger portion of freight transport to railways, with a clear goal of reducing GHG emissions and the environmental

20 Source: World Economic Forum (WEF). (2009). Supply Chain Decarbonization prepared within the framework of the Logistics and Transport Partnership Programme. Available at http://www3.weforum.org/docs/WEF_LT_SupplyChainDecarbonization_Report_2009.pdf.

21 Badr, Yarob (2018). ESCWA project proposal: Towards a Strategic Common Vision for the Development of Future Multi-modal Transport in the Arab Region. Presentation at the AASTMT Forum on the global impact of the Belt and Road Initiative on the Arab region. Alexandria, 17-18 September 2018.

22 ESCWA (2020). Energy Vulnerability in the Arab region.

impacts of transportation. Upon the completion of the first phase, it is estimated that rail container traffic will increase by 5 per cent by 2050.[23] In Algeria, work is underway to expand the railway network from the existing 4,200 Km to reach around 6,500 Km by 2024.[24]

Similarly, the Arabian Peninsula, Gulf Cooperation Countries are set to enhance regional trade integration through the completion of a 1,350-mile-long transcontinental rail network linking Saudi Arabia to the UAE and Oman. Work on the $15 billion[25] megaproject, which was launched in 2005 and was delayed several times, is finally back on track, and is expected to be completed by 2023.[26] The two years following its completion will be dedicated to linking up with Kuwait and Bahrain.

(ii) De-speeding or speed reduction

In its initial strategy to reduce GHG emissions from ships, the IMO identified speed optimization and speed reduction as short-term measures to address emissions from the transport sector.[27] The strategy emphasized the importance of considering "safety issues, distance travelled, distortion of the market or to trade and that such measure does not impact on shipping's capability to serve remote geographic areas".

Increased competitiveness among manufacturing companies in response to an increasingly demanding client base has shifted production modes to just on-time, on-demand production models, which incurs speedy delivery of manufactured products to target markets. To meet demand, speedy delivery of goods was favoured to the detriment of environmental considerations. Transportation vehicles are being operated at maximum speed, with frequent trips to meet requests for quick deliveries. Nevertheless, speed reduction, sometimes referred to as de-speeding, has proven benefits from the environmental and operation optimization perspectives. De-speeding was acknowledged as the most efficient short-term GHG emission mitigation measure in the maritime shipping sector.[28] Reducing the speed at which vehicles are travelling has a proven impact on emission reduction, where it is estimated that the fuel consumption, and hence carbon emissions, can be approximated by a cubic function of speed.[29]

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23 Railway Pro (2020). Jordan unveils its railway development strategy accessible from the internet: railwaypro.com/wp.

24 www.aps.dz/ar/economie/97878-2021.

25 Oxford Business Group (2014). Oman's rail project on track. Available at https://oxfordbusinessgroup.com/news/oman%E2%80%99s-rail-project-track.

26 Al Monitor- the Pulse of the Middle east. (2020). GCC Railway: a train across a fractured Gulf? Available at al-monitor.com/pulse/originals/2020/07/gcc-railway-train-fractured-gulf-qatar-saudi-arabia-uae.html.

27 Note by the International Maritime Organization to the UNFCCC Talanoa Dialogue Adoption of the Initial IMO Strategy on Reduction of GHG Emissions from Ships and Existing IMO Activity Related to Reducing GHG Emissions in the Shipping Sector.

28 Leaper,R. (2019). The role of slower vessel speeds in reducing greenhouse gas emissions, underwater noise and collision risk to whales. Front. Mar. Sci., 6 (2019), p.505.

29 Adland, R. (2020). Optimal ship speed and the cubic law revisited: Empirical evidence from oil tanker fleet. Transportation Research Part E 140.

Furthermore, under the current changing trade patterns towards more regionalized supply chains, and hence, consequently, shorter and denser transportation networks, speed reduction can be an increasingly feasible alternative to improve supply network resilience. Furthermore, de-speeding can support more resilient supply chains by encouraging businesses to better plan and organize their production and distribution processes, resulting in better preparedness and responses to future shocks.

(iii) Changes in logistics network design

This area of intervention for emission reduction and increased supply chain resilience focuses on optimizing operational approaches and management strategies. Optimization of transport logistics can greatly contribute to emission reduction goals that go well beyond those achieved through the decarbonization of energy sources,[30] through:

a. Integrating environmental factors

It is well recognized that environmental factors have a great impact on determining the energy efficiency of trips. In the maritime sector, these factors include wind speed and direction, water speed and depth of water. Traditionally, the focus in designing shipping routes would be on maximizing profit and minimizing fuel consumption, in addition to other factors such as matching demand and supply. Recently, the integration of environmental factors into planning and designing maritime transport itineraries based on weather when routing ships, also referred to as *"routing based on weather"*[31, 32] has been gaining momentum.

b. Greening vehicle routing problem (VRP)

Optimization of transportation logistics have typically focused on approaches to enhance network and route design towards the identification of the most efficient combination of travel routes in terms of cost savings and trip duration. An important approach in that respect is the ***vehicle routing problem*** (VRP) which aims to minimize the total route cost through optimization tools and techniques relying on mathematical modelling. Recently however, CO_2 emission reduction objectives are being factored in to solve the VRP when performing logistics optimizations. The methodological approach basically maintains the traditional distance-based targets, while incorporating changes in the mix of fuel sources used.[33]

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30 European Parliament (2010). Logistics as an instrument for tackling climate change. Available at http://www.europarl.europa.eu/studies.

31 Rehmatulla, N.; Smith, T. Barriers to energy efficiency in shipping: A triangulated approach to investigate the principal agent problem. Energy Policy 2015, 84, 44-57.

32 Rehmatulla, N.; Smith, T. Barriers to energy efficient and low carbon shipping. Ocean Eng. 2015, 110, 102-112.

33 Erdo ˇgan, S.; Miller-Hooks, E. A Green Vehicle Routing Problem. Transp. Res. Part E: Logist. Transp. Rev. 2012, 48, 100-114.

c. Improvement of load factors

This approach is based on integrating merchandise delivery (line hauls) with the pick-up of goods (back-hauling) within the same route. This arrangement yields higher fuel efficiencies and reduces transportation costs, while resulting in lower carbon emissions.

d. Horizontal cooperation

Refers to situations where companies collaborate on the implementation of joint transport logistics activities. The mutual benefits are proven and cover significant reductions in transportation costs. The potential cuts in CO_2 emissions under cooperative transportation logistics schemes can reach 25 per cent.[34]

e. Mixed approaches

It is also possible to combine one or more of these approaches in pursuit of magnified impacts. For example, combining horizontal cooperation with back-hauling, where one company shares its transportation vehicles used for line hauling with another to transport goods along the reverse route, has resulted in significant reduction in fuel consumption, leading to cuts in operating costs and GHG emissions. Data from real life examples have shown a 25 per cent reduction in costs as well as significant emission reductions.[35]

f. Mechanisms of implementation

Greener approaches could be achieved through top-bottom methods whereby government policies and regulations impose environmental standards on the logistics industry, a bottom-up approach through the adoption of best practices for the deployment of logistics services, or a combination of the two whereby logistics service providers seek accreditations certifying compliance with environmental standards.

Other approaches might be influenced by changes in perceptions and attitudes among both the general public and the logistics sector comparable to changes happening towards related environmental concerns, such as recycling. Compliance with environmental and emissions reductions standards could be used to leverage or boost a company's image. As such, the criteria for selecting a service provider would not be limited to price competitiveness and quality of services provided, but also the greening of the sector, which becomes a competitive advantage.

34 Ballot, E.; Fontane, F. Reducing transportation CO2 emissions through pooling of supply networks: Perspectives from a case study in French retail chains. Prod. Plan. Control 2010, 21, 640-650.

35 Bailey, E.; Unnikrishnan, A.; Lin, D.Y. Models for minimizing backhaul costs through freight collaboration. Transp. Res. Rec. 2011, 2224, 51-60.

III. Recommendations

Arab countries should institutionalize the climate trade facilitation measures they have adopted in response to the COVID-19 pandemic. Many Arab countries have taken various measures to facilitate trade during the pandemic, which helped encourage the flow of goods while maintaining precautionary measures to limit the spread of the virus. Arab countries should build on this experience to institutionalize these measures and improve them over time, having experienced their benefits and overcame certain implementation difficulties that existed before the pandemic. Enhancing trade facilitation implementation in the region is essential for seizing the opportunities presented by the recalibration of global supply chains for which the Arab countries are geographically and historically well positioned to benefit from, provided they gear up to it. Such major changes in global supply chain strategies have an advantage of tolerating higher costs for the sake of resilience and proximity to markets, yet such costs will only be accepted if they are necessary and minimized to the least extent possible. This makes trade facilitation improvement and logistics development corner stones for further integration into the global supply chain. Upgrading regional value chains among Arab countries is more important than ever to enhance their competitiveness and provide strategic replacement to old players in the global value chains. Such a momentum creates a greater opportunity for integration among Arab countries and strengthens the region's competitiveness in the new era.

Engaging in new or updated free trade agreements with major trading partners and manufacturing hubs, such as the EU, is essential for enhancing business opportunities in the region and bringing in more investments to it.

Arab countries need to position themselves in such a way to take advantage of structural changes and diversified sourcing of inputs by revisiting their national policy frameworks to encourage linkages with regional supply chains. In drawing their national and sectoral strategies, Arab countries should acknowledge the importance of aligning and harmonizing their environmental regulations and social policies with internationally approved standards.

The paper examines how Arab States have adapted their transport logistics processes to address challenges imposed by the pandemic and provides insights on how these can be built upon to consolidate and expand connectivity with regional and global value chains to reap social, environmental and economic benefits.

On one hand, the paper analyses short term country responses in balancing out the timely provision of critical goods, such as medicine and food, with tightened sanitary control measures by expediting customs clearance processes.

On the other hand, the longer-term approaches were considered in line with the "Build Back Better" better principle endorsed by the United Nations Secretary General. Despite exposing vulnerabilities in global value chains, the pandemic has nevertheless resulted in structural shifts in the production, distribution and trade landscape which are aimed towards less geographically concentrated manufacturing and trading systems for improved resilience against unexpected events. The current paradigm shift presents a valuable opportunity for Arab States, which are favourably positioned from a geographical and historical perspective, to improve engagement in regional and global value chains, since they are well prepared for it.

Proposed avenues for more effective engagement include the institutionalization of trade facilitation measures deployed in response to the global pandemic, consolidation of Arab regional trading networks, and better connectivity with neighbouring networks, among others. The timeliness for greening trade processes is also emphasized notably by harmonizing national sectoral policies and environmental guidelines with global environmental, health and safety standards.

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