



INDIA'S ARAB- MEDITERRANEAN CORRIDOR: A PARADIGM SHIFT IN STRATEGIC CONNECTIVITY TO EUROPE

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South Asia Scan

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**India's Arab-Mediterranean Corridor:
A Paradigm Shift in Strategic
Connectivity to Europe**

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Executive Summary

India's Arabian-Mediterranean (Arab-Med) Corridor to Europe is an emerging multi-modal, commercial corridor that could radically reconfigure trade patterns between the Indian Ocean Region, the Middle East and Europe by creating an arc of commercial connectivity spanning Eurasia's southern rim from India's Arabian Sea coast to Greece's eastern Mediterranean coast. For India, this new connectivity constitutes a strategic paradigm shift of enormous geopolitical consequence that could reshape its role in the Eurasian economic order.

The new connectivity architecture is a consequence of the 2020 diplomatic normalisation between the United Arab Emirates (UAE) and Israel, which is giving rise to the creation of a UAE-to-Israel railway network via Saudi Arabia and Jordan with Israel's Haifa port as its Mediterranean terminal. The trans-Mediterranean maritime link from Haifa to the European mainland at the massive transshipment port in Piraeus, Greece, means Indian goods shipped to the UAE's ports will be able to reach major markets and manufacturing centres of Europe. The India-to-Europe Arab-Med Corridor forms an alternative trans-regional commercial transportation route to the troubled Chabahar-based International North-South Transit Corridor. Instead of Chabahar, the ports of the UAE – India's third-largest trading partner – would serve as the Indian Ocean connectivity node. From Mumbai, Indian goods shipped via this multi-modal route could arrive on the European mainland in as little as 10 days, 40 per cent faster than via the Suez Canal maritime route.

Whether India becomes a global leader in forging this 21st century commercial architecture depends on New Delhi's ability to develop manufacturing value chains in the India-to-Europe Arab-Med Corridor. This work explains how the corridor presents New Delhi with unique opportunities that are highly conducive for value chain integration because of the existing synergies between India's

commercial ventures with its Arab Gulf partners and its commercial ventures with Israel.

India's ability to integrate into an India-to-Europe Arab-Med Corridor fundamentally hinges on how India manages its set of foreign partnerships to participate in the corridor. The current centrepiece of the India-to-Europe Arab-Med Corridor is the manufacturing value chain in food production and processing. The multi billion-dollar 'India-Middle East Food Corridor' project is being driven by the UAE and Saudi Arabia's investment partnerships with India that rely on the transformation of India's agriculture and water management sectors being implemented through India's partnership with Israel. In parallel, the UAE and Saudi Arabia are working with the Indian government and energy majors to develop an integrated hydrocarbon value chain through multi billion-dollar investments in higher value-added petrochemicals manufacturing in the country.

Innovative technologies, including those related to generation, storage and use of energy produced from renewable sources, are the most promising sectors for future value chain integration in the India-to-Europe Arab-Med Corridor. The analysis presented in this study shows that the strong policy emphasis in India, the UAE, Saudi Arabia, Israel and Greece on developing innovation ecosystems provides an overarching framework for cooperation in developing next-generation technologies and manufacturing based on them. Within the green energy innovation sector, all five countries are engaged in cutting-edge private sector development, the synergies among which create opportunities for multilateral joint venture partnerships in manufacturing.

By using its respective innovation economy partnerships with Israel and the UAE, India can act as a bridge to facilitate trilateral partnerships to utilise the natural synergies that exist among the three nations. Likewise, India can strengthen its cooperation with Greece by facilitating multilateral ventures that utilise similar synergies with Greece's innovation ecosystem. In this manner, this work suggests how India can utilise the rapidly growing bilateral investment partnerships among the UAE, Israel, and Greece as a springboard to develop multilateral, joint venture production

facilities among Arab-Med Corridor partners in India and other corridor countries.

The India-Israel partnership – in developing critical, next-generation technologies in agriculture, solar power generation and utilisation, electric batteries and electric vehicle charging as well as other sectors – has already resulted in manufacturing in India and serve as models for multilateral joint venture investment. Such enterprises would benefit from multilateral, joint venture partnerships, providing countries across the Arab-Med Corridor a supply chain advantage. India is well-positioned to facilitate such multilateral cooperation among the Arab-Med Corridor with countries to establish green energy-sector manufacturing plants in India and other corridor countries.

India can anchor itself in an India-to-Europe corridor through the establishment of joint venture production facilities with its Arabian and Mediterranean partners. The extent to which India succeeds at industrial value chain integration will determine its role in this new trans-regional commercial architecture, and with it, India's strategic standing as a Eurasian economic power.

Introduction: A Paradigm Shift in India's Eurasian Connectivity

Figure 1: India-Arabian Mediterranean Commercial Corridor



Source: Map configured by the author

India has a new strategic map. A new multi-modal, India-to-Europe commercial corridor is emerging from the interlinkage of the Arabian Sea and the Eastern Mediterranean that could radically reconfigure trade patterns between the Indian Ocean Region, the Middle East and Europe. One of the early fruits of the 2020 diplomatic normalisation between the UAE and Israel is the rail connection being established from the UAE via Saudi Arabia and Jordan to the Port of Haifa on Israel's Mediterranean coast. Combined with the trans-Mediterranean maritime link from Haifa to the European mainland at the massive transshipment port in Piraeus, Greece, India's maritime connectivity with the UAE will soon form part of a larger arc of commercial connectivity that extends from India to Greece. Freight rail service from Piraeus through the Balkans and Central Europe means that Indian goods can reach Austria, the Czech Republic and Germany – connecting India to major markets and manufacturing centres of Europe. Linking India's Arabian Sea coast to Greece's Eastern Mediterranean coast along Eurasia's southern rim, India's Arab-Med Corridor to Europe carries the potential to

transform the connectivity architecture of Eurasia and India's place in the global economic order.

For India, this new connectivity constitutes a paradigm shift of enormous geopolitical consequence. Since the early 2000s, China has sought to carve out a new trans-regional connectivity architecture in Eurasia that reorients commercial flows toward Beijing. Known today as the Belt and Road Initiative (BRI), Beijing has been working to create twin China-to-Europe commercial transportation corridors consisting of a cluster of Chinese-built overland rail and road routes extending westward and southward from Central Asia to serve as the backbone of what is known as the 'Silk Road Economic Belt' (the 'belt' of the BRI) and a series of Chinese-built port installations extending westward across the Indian Ocean to create what Beijing has termed the '21st Century Maritime Silk Road' (the 'road' of the BRI).

Since China commenced construction on Pakistan's Gwadar Port and the expansion of the China-to-Pakistan Karakoram highway in 2002, New Delhi's policymakers have sought the means to prevent India from being marginalised by Beijing's drive to establish a new Eurasian economic order. With India's overland access to Central Asia blocked by Pakistan and China, Beijing's consolidation of the Silk Road Economic Belt raised the prospect of India's complete strategic isolation in Central Asia.¹ Concurrently, New Delhi faced the possibility that the advancement of Beijing's 21st Century Maritime Silk Road would be tantamount to the maritime encirclement of India.

New Delhi's answer was to begin developing its own multi-modal corridor to reach Europe via Central Asia by constructing a modern deep-sea port on Iran's coast at Chabahar, 72 kilometres from Gwadar and overland transportation links running northward from Chabahar via Iran and Afghanistan to Central Asia. With the Chabahar port serving as the Indian Ocean connectivity node, New Delhi sought to establish the International North-South Transit

¹ Michaël Tanchum, "India's Not-So-Splendid Isolation in Central Asia: The Impact of Strategic Autonomy in an Emerging Asian Regional Architecture", *Harvard Asia Quarterly*, 15:3/4 (Fall/Winter 2013), pp. 66-72.

Corridor (INSTC) to create access to Central Asian, Russian and, ultimately, European markets, enabling India to effectively compete with China. However, over two decades, the INSTC's development has been beset by a series of geopolitical and economic setbacks and remains to be realised.

Now, an alternative trans-regional commercial architecture is forming wherein the UAE's ports can serve as the Indian Ocean connectivity node for a separate India-to-Europe commercial corridor. The UAE-to-Israel railway network is already almost entirely complete with only about 300 kilometres remaining to be built in Jordan and Saudi Arabia. The UAE seems committed to financing the completion of the rail construction as well as an expansion of the port of Haifa's container capacity.² Once the transportation route is operational, Indian goods leaving Mumbai could arrive on the European mainland in as little as 10 days.³ Compared to the maritime route via the Suez Canal, the Arab-Med Corridor's route would cut the travel time by approximately 40 per cent.⁴ The India-to-Europe Arab-Med Corridor would provide about the same cost reduction for Indian trade as the most optimistic scenarios for the INSTC.⁵

² Danny Zaken, "UAE \$10b Israel fund will stress ports and railways", *Globes*, 14 March 2021, <https://en.globes.co.il/en/article-uae-10b-israel-fund-will-stress-ports-and-railways-1001363975>.

³ The calculation is based on assuming a sailing speed of 10 knots for both the Arabian Sea (5.6 days) and Eastern Mediterranean (3.4 days) segments and allotting 24 hours for freight rail service to arrive from Dubai to Haifa. "Port of Mumbai to Mina Rashid (Port Dubai): 1335 nautical miles", n.d., *Ports.com*, [http://ports.com/sea-route/mina-rashid-port-dubai,united-arab-emirates/port-of-mumbai,india/#/?a=4030&b=12697&c=Port%20of%20Mumbai%20,%20India&d=Mina%20Rashid%20\(Port%20Dubai\),%20United%20Arab%20Emirates](http://ports.com/sea-route/mina-rashid-port-dubai,united-arab-emirates/port-of-mumbai,india/#/?a=4030&b=12697&c=Port%20of%20Mumbai%20,%20India&d=Mina%20Rashid%20(Port%20Dubai),%20United%20Arab%20Emirates); "Port of Haifa to Port of Piraeus: 828 nautical miles", n.d., *Ports.com*, <http://ports.com/sea-route/mina-rashid-port-dubai,united-arab-emirates/port-of-mumbai,india/#/?a=3679&b=3521&c=Port%20of%20Haifa,%20Israel&d=Port%20of%20Piraeus,%20Greece>.

⁴ The Mumbai-Piraeus maritime route via the Suez is 4,124 nautical miles and requires 17.2 travelling at 10 Knots. "Port of Mumbai to Port of Pireaus: 4124 nautical miles", n.d., *Ports.com*, <http://ports.com/sea-route/mina-rashid-port-dubai,united-arab-emirates/port-of-mumbai,india/#/?a=0&b=3521&c=Port%20of%20Mumbai%20&d=Port%20of%20Piraeus,%20Greece>.

⁵ Meena Singh Roy, "Iran: India's Gateway to Central Asia", *Strategic Analysis*, 36:6 (2012).

The Indispensable Value of Value Chains

Within the India-to-Europe Arab-Med Corridor, the Greece-to-Gulf segment has been coalescing through Greece deepening its strategic cooperation with Israel while simultaneously developing its strategic partnerships with the UAE and Saudi Arabia. The consolidation of the Greece-to-Gulf segment is itself part of a larger international scramble to establish trans-Mediterranean commercial corridors that also include attempts to establish commercial corridors connecting North Africa to southern Europe.⁶ Morocco's success in developing a West Africa-to-Western Europe corridor has demonstrated that commercial corridors only emerge where the requisite large investments in port and rail infrastructure are coupled with an industrial base anchored in a manufacturing value chain.⁷

India's ability to integrate into an India-to-Europe Arab-Med Corridor depends fundamentally on how India manages its set of foreign partnerships to participate in the manufacturing value chains. The India-to-Europe Arab-Med Corridor presents New Delhi with unique opportunities that are highly conducive for value chain integration because of the existing synergies between India's commercial ventures with its Arab Gulf partners and its commercial ventures with Israel. Nowhere is this better exemplified than the manufacturing value chain in food production and processing that is leading the development of the corridor. India's 'Food Corridor to the Middle East' is being driven by its investment partnerships with the UAE and Saudi Arabia that rely on the transformation of India's agriculture and water management sectors which is being implemented through a partnership with Israel. Similar

⁶ Michaël Tanchum, "Europe-Mediterranean-Africa Commercial Connectivity", Konrad Adenauer Stiftung Regional Programme Political Dialogue Southern Mediterranean (KAS PolDiMed – Tunis), November 2020, <https://www.kas.de/documents/282499/282548/Europe-Mediterranean-Africa+MED+Dialogue+31.pdf/000658ce-724a-d06d-208f-ea7ce5c4e409?version=1.1&t=1606310050425>.

⁷ Michaël Tanchum, "Morocco's Africa-to-Europe Corridor: Gatekeeper of a trans-regional strategic architecture", *AIES Fokus* 8/2020, Austrian Institute for European and Security Policy, 8 July 2020, <https://www.aies.at/publikationen/2020/fokus-20-08.php>.

synergies exist in other sectors, with the most promising synergies to be found in the green energy and innovative technology sectors in the UAE, Saudi Arabia, Israel and Greece. Utilising opportunities presented by its green energy and innovation economy initiatives, India can anchor itself in an India-to-Europe corridor through the establishment of joint venture production facilities with its Arabian and Mediterranean partners. The extent to which India succeeds at industrial value chain integration will determine its role in this new trans-regional commercial architecture, and with it, India's strategic standing as a Eurasian economic power.

India-UAE Connectivity: Gateway of India's Arab-Med Corridor

India's Arab-Med Corridor to Europe is anchored in the transformative connectivity that it is developing across the Arabian Sea with the UAE. The corridor expands upon the already robust trade relations that India enjoys with its western Indian Ocean neighbour and relies on new Emirati investments in logistics infrastructure in India for the large-scale transportation of commercial goods. The UAE is India's third largest trade partner with an overall bilateral trade volume of US\$41.85 billion (S\$55.55 billion)⁸ in 2020. In the immediate pre-COVID-19 period, India-UAE bilateral trade stood at US\$60 billion (S\$79.64 billion).⁹ India is also the UAE's largest market, with the former having purchased US\$22.5 billion (S\$30.04 billion) of Emirati goods in 2020.¹⁰ Building upon this foundation, a fundamental reconfiguration of the commercial architecture of the western Indian Ocean Region was initiated in January 2017 with the signing of a Comprehensive Strategic Partnership (CSP) agreement between Abu Dhabi and New Delhi. Signed during UAE Crown Prince Sheikh Mohammed bin Zayed's visit to India as chief guest for the country's Republic Day celebrations, the CSP's economic objectives call for boosting bilateral trade by 60 per cent and for new infrastructure investment worth US\$75 billion (S\$101.9 billion).¹¹ The CSP established a formal framework for the new era in India-UAE cooperation that was kick-started 16 months

⁸ "Direction of Trade Statistics", International Monetary Fund, 26 March 2021, <https://data.imf.org/?sk=9D6028D4-F14A-464C-A2F2-59B2CD424B85&sld=1515619375491>.

⁹ Waheed Abbas, "UAE-India bilateral trade reaches \$60b in 2018-19", *Khaleej Times*, 4 July 2019, <https://www.khaleejtimes.com/business/local/uae-india-bilateral-trade-reaches-60b-in-2018-19>.

¹⁰ Direction of Trade Statistics, International Monetary Fund, <https://data.imf.org/?sk=9D6028D4-F14A-464C-A2F2-59B2CD424B85&sld=1515619375491>.

¹¹ "India-UAE Joint Statement during State visit of Crown Prince of Abu Dhabi to India (January 24-26, 2017)", 26 January 2017, Ministry of External Affairs, https://www.mea.gov.in/bilateral-documents.htm?dtl/27969/India__UAE_Joint_Statement_during_State_visit_of_Crown_Prince_of_Abu_Dhabi_to_India_January_2426_2017.

earlier by Indian Prime Minister Narendra Modi's landmark August 2015 visit to the UAE, the first visit to the Emirates by an acting Indian prime minister in 34 years.

Following the CSP, the development of a new Indian-Emirati connectivity infrastructure was initiated in October 2017 when the Abu Dhabi Investment Authority (ADIA) signed a US\$1 billion (S\$1.34 billion) investment agreement with the National Investment and Infrastructure Fund of India (NIIF), India's sovereign wealth fund, making ADIA the first institutional investor in NIIF's Master Fund.¹² ADIA's investment in NIIF was followed in January 2018 by DP World's formation of a US\$3 billion (S\$4.05 billion) ports and logistics investment platform with NIIF called Hindustan Infralog Private Limited (HIPL).¹³ The Dubai-based global leader in cargo logistics and port operations is the lead shareholder in the HIPL infrastructure and logistics investment platform with a 65 per cent stake while NIIF owns holds the remaining 35 per cent share.

DP World already maintains operations at several Indian ports, including Jawaharlal Nehru Port (JNPT) on Mumbai's Arabian Sea coast. JNPT, also known as Nhava Sheva Port, is India's largest container port, handling about 50 per cent of India's containerised cargo.¹⁴ DP World operates one of JNPT's leading container terminals known as the Nhava Sheva International Container Terminal.¹⁵ To create an integrated transportation infrastructure to support trans-Arabian Sea value chain integration, HIPL's first investment was to acquire a US\$400 million (S\$534 million) controlling stake in Continental Warehousing Corporation, a leading multi-modal

¹² "NIIF and Abu Dhabi Investment Authority finalise investment agreement worth US\$1 billion", National Investment and Infrastructure Fund of India, 16 October 2017, <https://niifindia.in/niif-and-abu-dhabi-investment-authority-finalise-investment-agreement-worth-us1-billion/>.

¹³ "Our Portfolio", National Investment and Infrastructure Fund of India 2021, <https://niifindia.in/our-portfolio/>.

¹⁴ "Overview", 30 March 2021, Jawaharlal Nehru Port Trust, http://jnport.gov.in/jnpt_info.

¹⁵ "Preferred Port of Choice", *DP World Nhava Sheva ICT*, http://dpworldmumbai.com/php/nsict_content.php?catId=ODQ=&superId=ODQ=&masterId=MA==.

logistics company with a pan-India presence.¹⁶ In January 2021, DP World began construction on its Nhava Sheva Business Park (NSBP) Free Trade Zone five kilometres from JNPT. With 93,000 square metres of covered storage and state-of-the-art cargo handling facilities, the NSBP is designed to transform JNPT into a prime export hub and to spur Indian manufacturing and international value chain integration.¹⁷

¹⁶ Indulal P M and Arijit Barman, “DP World-NIIF platform makes debut with \$400 million Continental Warehousing buy”, *The Economic Times*, 18 March 2018, <https://economictimes.indiatimes.com/industry/transportation/shipping/-transport/dp-world-niif-platform-makes-debut-with-400-million-continental-warehousing-buy/articleshow/63352795.cms?from=mdr>.

¹⁷ “DP World lays foundation stone for Free Trade Zone in Mumbai”, *DP World*, 13 January 2021, <https://www.dpworld.com/news/releases/dp-world-lays-foundation-stone-for-free-trade-zone-in-mumbai/>.

India's Food Corridor Enhances the Arab-Med Commercial Architecture

The food processing sector has emerged as the centrepiece of India's value chain integration in the India-to-Europe Arab-Med Corridor because of the symbiosis between the Arab Gulf states' strategic need to ensure their food security and India's strategic imperative to increase the value of its food production. India is the world's second largest food producer when measured by calorie content but ranks fourth when measured by the total value of agricultural production,¹⁸ owing largely to the fact that India processes less than 10 per cent of its agricultural output.¹⁹ Additionally, almost all of India's food processing consists of low value-added primary food such as rice, sugar, edible oil and flour. According to the oft-cited, most recent *Annual Survey of Industries* (2016-2017), more than one out of every 10 members of India's workforce is employed in the food processing sector.²⁰ Developing higher value-added, secondary food processing and preventing distribution loss through efficient integration from farm to retail outlets form two of the highest strategic priorities for India.

With the development of an India-Middle East Food Corridor at the forefront of New Delhi's efforts to achieve value chain integration within the Arab-Med Corridor, India has engaged with the UAE in a massive US\$7 billion (S\$9.51 billion) project to create an India-UAE Food Corridor to ensure the food security of the Emirates and other Middle Eastern countries.²¹ One of the 14 Comprehensive Strategic Partnership agreements signed in January 2017 by New Delhi and

¹⁸ Soma Dutta, "Top 25 Agricultural Producing Countries in the World", *Yahoo Finance*, 16 October 2020, <https://finance.yahoo.com/news/top-20-agricultural-producing-countries-151350776.html>.

¹⁹ "Indian Food Processing Sector – Trends and Opportunities", Confederation of Indian Industry, August 2019, p. 2.

²⁰ Ibid.

²¹ "UAE firms to invest up to \$7 billion in India-UAE food corridor: Indian minister", *Gulf News*, 24 July 2019, <https://gulfnews.com/world/asia/india/uae-firms-to-invest-up-to-7-billion-in-india-uae-food-corridor-indian-minister-1.1569344178374>.

Abu Dhabi was an initiative to develop a framework for “cooperation in various agricultural fields of mutual interest, including through enhancement of cooperation in food processing and transfer of technology in cultivation methods.”²² In September 2019, the Dubai-based real estate development giant Emaar Group announced that it would coordinate investments up to US\$7 billion (\$9.51 billion) from various Emirati entities in the India-UAE Food Corridor.²³ Although Emaar’s press statement promised to announce the details at a later date, India’s Minister of Railways and Minister of Commerce and Industry, Piyush Goyal, informed the press during a visit to the UAE that approximately 70 per cent of the funds were intended to be invested in mega food parks in various Indian cities while the remaining 30 per cent would be invested in contract farming, sourcing of agricultural commodities and related infrastructure.²⁴

In addition to the Emaar Group, the Dubai Chamber of Commerce is facilitating coordination between Emirati and Indian entities to advance the development of a dedicated logistics infrastructure that connects India’s farms through the entire value chain to the UAE’s ports.²⁵ The UAE aims to purchase food grains, fruits and vegetables directly from farmers in Punjab, Uttar Pradesh, Madhya Pradesh Gujarat and Maharashtra to be delivered to eight processing facilities to be constructed in India with Emirati financing. The Dubai Multi-Commodities Centre has created an agriculture trading platform called ‘Agriota’ to link Indian farmers with food companies in the UAE, while DP World is leading the effort to provide integrated supply chain solutions for foodstuff transportation and storage for the food corridor to function.²⁶ Over two million Indian farmers are

²² Press Release, “List of Agreements/MOUs exchanged during the State visit of Crown Prince of Abu Dhabi to India”, Press Information Bureau, Government of India, 25 January 2017, <https://pib.gov.in/PressReleaseSelfframePage.aspx?PRID=1514426>.

²³ “UAE firms to invest up to \$7 billion in India-UAE food corridor: Indian minister”, op. cit.

²⁴ Ibid.

²⁵ “India-UAE Food Dialogue Explores Prospects For Boosting UAE-India Food Security Cooperation”, Dubai Chamber, 28 October 2020, https://www.dubaichamber.com/whats-happening/chamber_news/india-uae-food-dialogue-explores-prospects-for-boosting-uae-india-food-security-cooperation.

²⁶ “India poised for major investments From UAE in food, agritech”, *India Inc.*, 2020, <https://indiaincgroup.com/india-poised-for-major-investments-from-uae-in-food-agritech/>.

expected to benefit from the food corridor, which will create an estimated additional 200,000 jobs.²⁷

Undeterred by the COVID-19 pandemic, the UAE hosted a two-day UAE-India Food Security Summit in December 2020 in Dubai, where over 500 public and private sector organisations participated to advance the food corridor project.²⁸ As India and the UAE eye tripling their food trade by 2025, DP World's head of business development announced to the summit that the company was proceeding with the development of the requisite agricultural transportation and food terminal infrastructure. Similarly, Sharaf Group, a Dubai-based conglomerate, announced that it was planning an additional investment ranging upward to US\$1 billion (S\$1.34 billion).²⁹ Sharaf Group operates in over 40 countries and maintains diverse operations in the shipping, logistics, supply chain and retail sectors.³⁰ Sharaf Group has already invested over US\$300 million (S\$400 million) to build logistics, infrastructure services, warehousing and storage that will support the food corridor.³¹

The Abu Dhabi-based retailing conglomerate, Lulu Group, known in the Gulf and Asia for its hypermarkets, already imports vegetables, fruits, fish and meat from India, and is likewise an enthusiastic participant in the food corridor project. As the Lulu Group International's Chief Executive Officer (CEO), Saifee Rupawala, explained at the UAE-India Food Security Summit, "As a preferred trade hub for Indian businesses, UAE can offer several competitive advantages such as its world-class logistics and transport infrastructure as well as a geographic position enabling Indian food exporters to expand their reach across the GCC markets."³² The fact that the Chairman and Managing Director M A Yuseff Ali and other

²⁷ Ibid.

²⁸ Dhanusha Gokula, "UAE business leaders hungry to invest in India's food sector", *Khaleej Times*, 9 December 2020, <https://www.khaleejtimes.com/business/uae-business-leaders-hungry-to-invest-in-indias-food-sector>.

²⁹ Ibid.

³⁰ "Group Profile", Sharaf Group, 2020, <https://www.sharafgroup.com/english/who-we-are.html>.

³¹ Gokula, op. cit.

³² Ibid.

senior staff of the Lulu Group hail from Kerala, points to the vital role played by the UAE's Indian community in supporting trans-Arabian Sea commercial connectivity. The UAE hosts the world's second-largest overseas Indian community, second only to the United States (US), comprising over one-third of the UAE's population. In contrast to the US, the UAE's Indian community is almost entirely composed of non-resident Indians (NRI).³³ The UAE's NRI community has been contributing on a strategic scale to the effort to forge UAE-India commercial connectivity since the January 2017 CSP agreement. In March 2017, the UAE's Ministry of Economy, in partnership with the Embassy of India (Abu Dhabi) and the Consulate General of India (Dubai), formed the Business Leaders Forum (BLF) as a platform to promote private sector trade and investment between the UAE and India. The BLF formed the NRI-Emirati Investors Group (a consortium of UAE-based private investors), which announced in October 2017 the establishment of a US\$1 billion (S\$1.34 billion) fund to finance infrastructure projects in India.³⁴

Saudi Arabia similarly eyes playing a primary role in the India-Middle East food corridor. Its involvement in the project comprises part of Riyadh's larger commitment to invest in India. As part of the establishment of the Saudi Arabia-India Strategic Partnership Council in 2019, Saudi Arabia's sovereign wealth fund, the Public Investment Fund (PIF), committed an investment of US\$100 billion (S\$134.34 billion) in key strategic sectors of the Indian economy.³⁵ In May 2020, the Saudi Agriculture and Livestock Investment Company (SALIC), a wholly owned PIF subsidiary, acquired a 29.9 per cent stake in Daawat Foods Ltd, one of five manufacturing subsidiaries of LT Foods,³⁶ a Gurugram headquartered company. Daawat, known for its quality line of basmati rice, accounts for about 22 per cent of LT

³³ "Population of Overseas Indians", Ministry of External Affairs, December 2018, http://mea.gov.in/images/attach/NRIs-and-PIOs_1.pdf.

³⁴ Mahmoud Kassem, "UAE consortium to raise \$1bn for big-ticket India project", *The National News*, 30 October 2017, <https://www.thenationalnews.com/business/economy/uae-consortium-to-raise-1bn-for-big-ticket-india-projects-1.671353>.

³⁵ Hala Tashkandi, "Envoy: \$100bn Saudi investment in India 'on track'", *Arab News*, 23 December 2020, <https://www.arabnews.com/node/1781826/business-economy>.

³⁶ "SALIC buys 29.9% stake in India's Daawat Foods", *Argaam*, 22 May 2020, <https://www.argaam.com/en/article/articledetail/id/1378131>.

Foods' total production. For SALIC, robust value chain integration that increases the efficiency of rice production and ensures supply to the kingdom is a strategic imperative. SALIC is also exploring other investment opportunities in food production in India. During a March 2021 visit to India, SALIC's CEO described the company as "keen to deepen engagement with the Indian food processing sector."³⁷

India's ambition to be the food basket of the Middle East fundamentally rests on its ability to increase its agricultural yield and manage its water resources. Its partnership with Israel is proving pivotal for India to achieve both objectives. Between 2012 and 2015, Israel established 29 agricultural centres of excellence across India as a platform for the rapid transfer of technology and best practices to India's farmers.³⁸ In 2019 alone, an estimated 150,000 Indian farmers received training at these centres.³⁹ Beyond government development initiatives, Israeli agricultural companies have played a transformative role in the Indian farming and water management sectors.

In 2009, Israeli crop protection company, ADAMA Agricultural Solutions, entered the Indian market and, within five years, rose to become one of India's top three companies in the industry, operating a formulation plant in Gujarat and a research and development centre in Hyderabad.⁴⁰ Israel's Evogene worked with Rasi Seeds Ltd to improve the Indian rice quality and yield,⁴¹ and,

³⁷ "Saudi Arabia's Salic to step up India agri investments", *The Economic Times*, 5 March 2021, <https://economictimes.indiatimes.com/news/economy/agriculture/saudi-arabias-salic-to-step-up-india-agri-investments/articleshow/81346270.cms>.

³⁸ "The Indo-Israeli Agricultural Project", MASHAV – Israel's Agency for International Development Cooperation", https://mfa.gov.il/MFA/mashav/Publications/Subject_Publications/Documents/Indo-Israeli%20Agricultural%20Project.pdf.

³⁹ Press Trust of India, "Israeli Embassy to have 'Water Attache' in India from January; North-East Consul: Ambassador", *The Economic Times*, 19 October 2020, <https://economictimes.indiatimes.com/news/politics-and-nation/israeli-embassy-to-have-water-a-ttache-in-india-from-jan-north-east-consul-ambassador/articleshow/78749771.cms>.

⁴⁰ "Our History", ADAMA India, <https://www.adama.com/india/en/learn-about-us/ma-india-history.html>.

⁴¹ Press Release, "Rasi Seeds and Evogene to Collaborate on Improving Key Traits in Rice", Evogene, 18 June 2012, https://www.evogene.com/press_release/rasi-seeds-evogene-collaborate-improving-key-traits-rice/.

more recently, Hazera, a global leader in the seed industry, entered the Indian market.⁴² In 2019, Profit Agro Ltd launched its first Indian Hydroponic Raft System in Bengaluru, helping to move India further towards industrialised agriculture.⁴³ Israel-India private sector agricultural cooperation has led to the establishment of joint venture manufacturing facilities in India. Israel's drip irrigation systems manufacturer, Metzer, constructed a manufacturing facility as a 50-50 joint venture with Indian pipeline manufacturer, Skipper, to produce drip irrigation system components.⁴⁴ In April 2020, the dedicated plant housed within Skipper's Hyderabad production site became operational with an initial annual capacity to produce 88 million metres of drip irrigation and sprinkler irrigation products for sale in India and Asian markets.⁴⁵ Israeli drip irrigation technology is an essential part of India's strategy to cope with growing water shortages that are forcing its growers to find alternatives to flood irrigation, in which 50 per cent of the applied water never reaches the crop. Israel's precision irrigation firm, Netafim, has projects in over 100 villages in Karnataka to serve approximately 60,000 rural farmers.⁴⁶

Israel, ranked by the Global Water Intelligence as having the world's best water efficiency,⁴⁷ is playing a vital role to help India ensure adequate water supplies. Increased agricultural production puts further strain on the country's ecosystem as the Modi government

⁴² Nili Snir, "Impressions of a Seed Company Engaged in the Asia & Pacific Regions", Hazera, 19 September 2019, <https://www.hazera.com/2019/09/impressions-of-a-seed-company-engaged-in-the-asia-pacific-regions/#more-8581>.

⁴³ "Profit Agro HRS System in India", Profit-Agro, 28 April 2019, <https://www.profit-agro.com/profit-agro-hrs-in-india/>.

⁴⁴ "Metzer and Skipper Limited enter into a joint venture", Metzer, 27 February 2018, <https://www.metzer-group.com/metzer-skipper-limited-enter-exclusive-joint-venture-agreement-redefine-micro-irrigation-india-saarc-nations/>.

⁴⁵ Press Trust of India, "Skipper-Metzer JV Plant starts operations", *The Week*, 3 April 2020, <https://www.theweek.in/wire-updates/business/2019/04/30/ccm6-biz-skipper-metzer.html>.

⁴⁶ Netafim is now an 80 per cent owned subsidiary of the Mexican firm Orbia. "Netafim Chosen to Deploy Four Large Community Irrigation Projects Across India", Netafim, 11 March 2019, <https://www.netafim.com/en/news-and-events/news/Netafim-Chosen-to-Deploy-Four-Large-Community-Irrigation-Projects-Across-India/>.

⁴⁷ Alan Rosenbaum, "Is Israel's Scarcity of Water a Blessing in Disguise?", *The Jerusalem Post*, 7 January 2021, <https://www.jpost.com/jpost-tech/is-israels-scarcity-of-water-a-blessing-in-disguise-654578>.

seeks to meet its target of providing piped water to all Indian households by 2024.⁴⁸ Israel's national water company, Mekorot, is engaged in a US\$1.4 billion (\$\$1.79 billion) project with Maharashtra's water supply and sanitation department to create a water grid to provide supplies to the 30 million inhabitants of the state's drought-stricken Marathwada region that has been experiencing large scale crop failures.⁴⁹ Mekorot is working on similar projects in Harayana, Rajasthan and Uttar Pradesh's Bundelkhand region.⁵⁰ Punjab has also contracted with the company to formulate a Water Conservation and Management Master Plan to address the state's drastic water loss due to agriculture.⁵¹ Israel's TAHAL Group, Aquallence and Aqwise have been involved in water treatment and supply to population centres from Bengaluru to Agra,⁵² while Ayala Water & Ecology Ltd, known for its phytoremediation systems, is using plants to clean sections of the Yamuna and Ganges rivers as well as lakes in Bengaluru and Hyderabad.⁵³

⁴⁸ Mahesh Langa, "19 Crore rural households to get tap water by 2024", *The Hindu*, 27 December 2020, <https://www.thehindu.com/news/national/19-crore-rural-households-to-get-tap-water-by-2024/article33425948.ece>.

⁴⁹ "Israel's water tech company to help resolve water-parched Marathwada's water woes", *Mirror Now News*, 7 July 2020, <https://www.timesnownews.com/mirror-now/in-focus/article/israels-water-tech-company-to-resolve-marathwadass-water-woes/450094>.

⁵⁰ "Israel to begin water study in Bundelkhand", *The Times of India*, 15 October 2020, <https://timesofindia.indiatimes.com/city/lucknow/israel-to-begin-water-study-in-bundelkhand/articleshow/78670669.cms>.

⁵¹ Hapreet Bajwa, "Drop in Punjab's ground water level sounds alarm", *The New Indian Express*, 27 January 2020, <https://www.newindianexpress.com/nation/2020/jan/27/drop-in-punjabss-ground-water-level-sounds-alarm-2094997.html>.

⁵² "Continuing its winning streak of projects in India, TAHAL Group secures a 28 million US\$ contract for upgrading and operation of a water supply system in Bangalore", Tahal Group, 26 February 2018, <https://www.tahal.com/us-28-million-contract-for-upgrading-and-operation-of-a-water-supply-system-in-bangalore/>; <https://itrade.gov.il/india/2019/04/17/launch-of-aquallences-nanoblue-system/>; and "Wastewater treatment co Aqwise raises \$4.5m", *Globes*, 2 August 2012, <https://en.globes.co.il/en/article-1000771039>.

⁵³ Viva Sarah Press, "Ayala Water & Ecology to clean up Yamuna in India", *Israel 21C*, 14 February 2017, <https://www.israel21c.org/ayala-water-ecology-to-clean-up-yamuna-in-india/>.

Petrochemicals Manufacturing: Integrating India's Hydrocarbon Value Chain

The India-Middle East Food Corridor, a strategic food reserve for the UAE and Saudi Arabia, parallels the strategic petroleum reserve maintained in Padur, Karnataka, in partnership with Abu Dhabi National Oil Company (ADNOC). The UAE-India CSP's initial package of 14 agreements included an agreement for ADNOC to store crude oil in partnership with the Strategic Petroleum Reserves Limited (ISPRL).⁵⁴ After a subsequent 2019 agreement between ADNOC and ISPRL, the former will use half of Padur's underground storage facility to store 2.5 million tonnes.⁵⁵ In 2020, the UAE was India's third largest supplier of crude oil, following Iraq and Saudi Arabia, providing 11 per cent of India's import supply mix.⁵⁶

Building on the establishment of an Arabian strategic reserve in India, the UAE and Saudi Arabia are working with New Delhi to develop an integrated hydrocarbon value chain through the creation of petrochemical manufacturing plants. Petrochemicals are the components of plastics, fibres, foams, adhesives and dyes that form the basic elements of most consumer products and their manufacture is a higher value-added form of production. ADNOC and Saudi Aramco are jointly investing US\$44 billion (\$\$58.76 billion) in the construction and operation of a refinery and petrochemicals manufacturing complex in Maharashtra, the Ratnagiri Refinery and

⁵⁴ Press Release, "List of Agreements/MOUs exchanged during the State visit of Crown Prince of Abu Dhabi to India", Press Information Bureau, Government of India, 25 January 2017, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1514426>.

⁵⁵ Press Trust of India, "Abu Dhabi National Oil Company to fill up half of Padur strategic crude oil storage", *The Economic Times*, 12 February 2019, <https://economictimes.indiatimes.com/industry/energy/oil-gas/abu-dhabi-national-oil-company-to-fill-up-half-of-padur-strategic-crude-oil-storage/articleshow/67955101.cms?from=mdr>.

⁵⁶ Dania Saadi and Sambit Mohanty, "ADNOC, India mull collaboration in new energy areas, including hydrogen: CEO", *S&P Global Platts*, 18 March 2021, <https://www.spglobal.com/platts/es/market-insights/latest-news/oil/031821-adnoc-india-mull-collaboration-in-new-energy-areas-including-hydrogen-ceo>.

Petrochemicals Limited (RRPCL), located about 100 kilometres from Mumbai.⁵⁷ The original agreement signed in June 2018 represents the largest investment in India's refinery sector. While the two Middle Eastern companies are the co-owners, holding a 50 per cent share in the RRPCL project, the remaining stake is owned by a consortium of Indian state-owned energy companies.⁵⁸ The refinery, with a production capacity of 1.2 million barrels per day (bpd), along with its associated petrochemical complex, represents a strategic advance in supply chain integration. "By investing in this project", UAE Minister of State and ADNOC Group CEO, Dr Sultan Ahmad Al Jaber, explained, "[W]e will both secure offtake of our crude to a key market for Adnoc [*sic*], as well as strengthen access in one of the world's largest and fastest-growing refining and petrochemical markets."⁵⁹

Saudi Arabia is playing the lead foreign role in the value chain integration of India's oil-to-chemicals manufacturing sector. Its global chemicals giant, SABIC, a subsidiary of Saudi Aramco, operates a petrochemicals manufacturing complex in Vadodara, Gujarat and the 45-acre SABIC Technology Centre in Bengaluru (STC-B). In November 2019, following the establishment of the India-Saudi Arabia Strategic Partnership Council, SABIC began to focus on STC-B for the development of next-generation thermoplastics to replace heavy metallic structures in automobile components, electric vehicles batteries and other products.⁶⁰ In 2019, SABIC's parent company, Saudi Aramco, agreed to acquire a 20-per cent stake in Reliance's refining and petrochemical manufacturing operations for US\$15 billion (S\$20.4 billion). India's largest private refiner is in the process of creating a wholly owned subsidiary, Reliance O2C, to run its oil-to-chemicals operations. Although delayed due to the

⁵⁷ Reuters, "India's Maharashtra identifies site for Saudi Aramco, ADNOC's refinery", *Alarabiya News*, 19 June 2019, <https://english.alarabiya.net/business/energy/2019/06/19/India-s-Maharashtra-identifies-site-for-Saudi-Aramco-ADNOC-s-refinery>.

⁵⁸ Fareed Rahman, "Adnoc, Saudi Aramco sign deal to invest in India's refinery plant", *Gulf News*, 25 June 2018, <https://gulfnews.com/business/energy/adnoc-saudi-aramco-sign-deal-to-invest-in-indias-refinery-plant-1.2242093>.

⁵⁹ Ibid.

⁶⁰ Peerzada Abrar, "Saudi chemical giant SABIC bets big on India to create future tech products", *Business Standard*, 25 November 2019, https://www.business-standard.com/article/technology/saudi-chemical-giant-sabic-bets-big-on-india-to-create-future-tech-products-119112400303_1.html. Accessed on 9 March 2021.

COVID-19 pandemic, the formal establishment of Reliance O2C and the continued recovery of oil prices throughout 2021 will likely see the Reliance-Aramco deal implemented by the second quarter of the fiscal year 2022.⁶¹ Reliance O2C's assets include the twin refineries in Jamnagar, Gujarat, and the associated petrochemicals complex. The Reliance-Aramco partnership will see Reliance O2C purchase 500,000 bpd from Saudi Aramco to supply about 28 per cent of the refinery's capacity.⁶² The Reliance-Aramco partnership marks a significant advance in value chain integration with 70 per cent of the refined crude being earmarked for the manufacture of high-value petrochemicals.

⁶¹ Sambit Mohanty, "Analysis: Reliance's move to spin off oil may have cleared decks for Saudi Aramco deal", *S&P Global Platts*, 25 February 2021, <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/022521-analysis-reliances-move-to-spin-off-oil-may-have-cleared-decks-for-saudi-aramco-deal>.

⁶² Nevin John, "Saudi Aramco's rising oil fortune to speed up Reliance O2C deal", *Business Today*, 11 March 2021, <https://www.businesstoday.in/current/corporate/saudi-aramco-rising-oil-fortune-to-speed-up-reliance-o2c-deal/story/433600.html>.

The Innovation Corridor: Green Energy and Innovative Technology Manufacturing Value Chains

Innovative technologies, including those related to the generation, storage and use of energy produced from renewable sources, are highly promising sectors for future value chain integration in the India-to-Europe Arab-Med Corridor. The strong policy emphasis in India, the UAE, Saudi Arabia, Israel and Greece on developing innovation economies provides an overarching framework for cooperation in developing next-generation technologies and manufacturing based upon them. Within the green energy innovation sector, all five countries are engaged in cutting-edge private sector development, the synergies among which create opportunities for multilateral cooperation and the establishment of manufacturing joint venture partnerships.

As the European landfall for the India-to-Europe Arab-Med Corridor, Greece's integration into the corridor's emerging value chains constitutes a strategic imperative for both Athens and the other members of the corridor. Beyond their shared threat perception from the deepening defence cooperation between Pakistan and Turkey, New Delhi and Athens have a strategic imperative to develop their economic cooperation to advance value chain integration in the corridor. An initial step was taken in July 2018 when India's President Ram Nath Kovind visited Greece with an agenda to advance India-Greece economic relations.⁶³ This was the first visit to Greece by an Indian president in 11 years, and focused on promoting business cooperation in shipping and food production.⁶⁴ In September 2019, Modi and Greece's Prime Minister Kyriakos Mitsotakis met on the sidelines of the United Nations General

⁶³ ANI, "India, Greece to boost economic ties", *Business Standard*, 19 June 2018, https://www.business-standard.com/article/news-ani/india-greece-to-boost-economic-ties-118061900062_1.html.

⁶⁴ IANS, "President Ram Nath Kovind to visit Greece, Suriname, Cuba", *The New Indian Express*, 12 June 2018, <https://www.newindianexpress.com/nation/2018/jun/12/president-ram-nath-kovind%E2%80%8Bto-visit-greece-suriname-cuba-1827202.html>.

Assembly meeting in New York to discuss how the two countries could promote their business relations.⁶⁵

Greece's economic relations with India, the UAE and Saudi Arabia hold great potential as the country comes out of its economic doldrums and emerges as a leading innovation economy. According to Bloomberg's Innovation Index 2021, Greece now ranks as the 30th most innovative economy, leading India (50th) and its Arab Gulf partners, the UAE (43rd) and Saudi Arabia (53rd).⁶⁶ A natural synergy exists among Greece, Indian, Emirati and Saudi venture capital investment platforms. Israel, ranked by the same index as the world's seventh most innovative economy, provides Greece with significant partnership opportunities beyond the two countries' joint weapons manufacturing initiatives. Since the 2020 normalisation, the UAE has been similarly seeking to develop a robust partnership with Israel across several innovative technology sectors. The example of India and Israel's extensive cooperation in innovative technologies and green energy demonstrates the enormous potential for multilateral partnerships among the five corridor countries as well as pointing to the critical role India can play in facilitating the formation of multilateral venture partnerships.

The Start-Up Corridor: Innovation Technology Partnerships

Among the nations in the India-to-Europe Arab-Med Corridor, India and Israel have engaged in the most robust cooperation concerning innovative technologies and start-ups, with several of India's largest firms investing in Israel's innovation ecosystem starting in the middle of the previous decade. In 2016, India's Tata Group invested in a start-up incubator in Israel while Reliance Industries invested in a separate Israeli incubator in 2017.⁶⁷ Also, in 2017, Wipro Ltd entered

⁶⁵ Nick Kampouris, "Prime Ministers of Greece and India Reaffirm Close Ties", *Greek Reporter*, 28 September 2019, <https://greekreporter.com/2019/09/28/prime-ministers-of-greece-and-india-reaffirm-close-ties/>.

⁶⁶ List available via Michelle Jamrisko, Wei Lu and Alexandre Tanzi, "South Korea Leads World in Innovation as U.S. Exits Top Ten", *Bloomberg*, 3 February 2021, <https://www.bloomberg.com/news/articles/2021-02-03/south-korea-leads-world-in-innovation-u-s-drops-out-of-top-10>.

⁶⁷ Press Release, "Tata group joins hands with global leaders to set up an IoT technology incubator in Israel", Tata Group, 14 November 2016, <https://www.tata.com/newsroom/Tata-group-joins-hands-with-global-leaders-to-set-up-an-IoT-technology-incubator-in->

into a joint venture partnership with RAMOT, Tel Aviv University's incubator and private sector technology transfer platform, to develop new artificial intelligence (AI) technologies⁶⁸ while Larsen & Toubro opened a Centre of Excellence in the Middle Eastern country to deepen its involvement in Israel's development of next-generation and disruptive technologies.⁶⁹

During the same period, India's International Centre for Entrepreneurship and Technology, known as iCreate, was established with advice and support from the Israel Innovation Authority and other stakeholders in the latter's innovation ecosystem. Since iCreate's January 2018 inauguration, which was presided over by Modi and Israeli Prime Minister Binyamin Netanyahu, the institution has operated as a Centre of Excellence and a meta-incubator to develop India's innovation ecosystem.⁷⁰ In September 2020, iCreate and Start-Up Nation Central, Israel's trailblazing private sector organisation, signed a memorandum of understanding (MoU) to create a bilateral programme to accelerate innovation and technology cooperation between start-ups and corporations from the two countries.⁷¹ Start-Up Nation Central facilitates customised business engagement between Israel's innovation ecosystem and foreign public and private sector

Israel; Prasad, Rachita, "Reliance Industries to invest in start-up incubator in Israel", *The Economic Times*, 20 July 2017, <https://economictimes.indiatimes.com/small-biz/money/reliance-industries-to-invest-in-start-up-incubator-in-israel/articleshow/59686709.cms?from=mdr>.

⁶⁸ Press Release, "Wipro and Ramot at Tel Aviv University Partner for Joint Research in Emerging Technologies", Wipro, 5 July 2017, <https://www.wipro.com/newsroom/press-releases/2017/wipro-and-ramot-at-tel-aviv-university-partner-for-joint-research-in-emerging-technologies/>.

⁶⁹ Press Release, "L&T Technology services limited expands its presence in Israel with the launch of a center of excellence and a sales office", L&T Technology Services, 14 November 2017, <https://www.lts.com/press-release/lts-expands-presence-israel>.

⁷⁰ "What is iCreate?", *The Indian Express*, 17 January 2018, <https://indianexpress.com/article/what-is/what-is-icreate-narendra-modi-benjamin-netanyahu-5028836/>.

⁷¹ "Israel, India sign MoU to collaborate on tech innovation", *Calcalistech*, 22 September 2020, <https://www.calcalistech.com/ctech/articles/0,7340,L-3850954,00.html>.

entities.⁷² According to the CEO of Start-Up Nation Central, Professor Eugene Kandel, the agreement between his organisation and iCreate represents “an important step in realizing the potential of the India-Israel relations in the field of innovative technologies.”⁷³ In December 2020, Start-Up Nation Central was instrumental in launching the UAE-IL Tech Zone initiative that seeks to build a hub that bridges the Israeli and Emirati technology ecosystems.⁷⁴

India has also concurrently engaged in efforts to develop similar cooperation with the UAE, albeit on a much more modest scale. One of the 14 India-UAE CSP agreements was a MoU for Emirati-Indian cooperation in the promotion of small and medium enterprises.⁷⁵ With a focus on advancing innovation, the MoU between India’s Ministry of Micro, Small and Medium Enterprises and the UAE’s Ministry of Economy called for joint projects as well as research and development activities. As with the NRI-Emirati Investors Group fund investing US\$1 billion (\$\$1.34 billion) in Indian infrastructure development that will advance its food corridor to the Middle East, the UAE’s Indian community is also helping to link the two countries in the development of an innovation corridor. Indians comprise 30 per cent of Dubai’s start-up community, and the UAE is trying to incentivise more Indian start-ups in the country by offering Emirati citizenship to both innovators and investors as well as their families.⁷⁶

By using its respective innovation economy partnerships with Israel and the UAE, India can act as a bridge to facilitate trilateral partnerships to utilise the natural synergies that exist among the three nations. For example, in 2018, one year after Wipro formed its AI joint venture partnership with Israel’s RAMOT, the Indian Ministry of Commerce and Industry’s InvestIndia signed an agreement with

⁷² “About Us”, *Start-Up Nation Central*, <https://www.startupnationcentral.org/about-start-up-nation-central/>.

⁷³ “Israel, India sign MoU to collaborate on tech innovation”, op. cit.

⁷⁴ “About Our Mission”, UAE-IL Tech Zone, <https://www.uaeil.tech/about-us>.

⁷⁵ “Press Release, List of Agreements/MOUs exchanged during the State visit of Crown Prince of Abu Dhabi to India”, Prime Minister’s Office, 25 January 2017, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1514426>.

⁷⁶ Mediawire, “Dubai Shines as India-UAE Ties Grows Stronger”, *The Economic Times*, 17 February 2021, <https://economictimes.indiatimes.com/news/economy/foreign-trade/dubai-shines-as-india-uae-ties-grows-stronger/articleshow/81040815.cms>.

the UAE's Ministry for Artificial Intelligence to create an India-UAE Artificial Intelligence Working Committee tasked with meeting annually to invest in AI start-ups and research in partnership with private sector entities.⁷⁷ With the 2020 UAE-Israel diplomatic normalisation, such partnerships may now be conducted in a trilateral framework. Although discussed with increasing frequency in the media, the enormous potential of trilateral ventures among India, the UAE and Israel remains to be actualised.⁷⁸

Multilateral joint ventures can also utilise the new synergies from the UAE's expanding economic cooperation with Greece. One month after the 15 September 2020 signing of the 'Abraham Accords' normalising relations between the UAE and Israel, Greek-Emirati strategic cooperation advanced to a substantially higher level in November 2020 as a result of the landmark state visit to the UAE by Mitsotakis, during which the two countries signed several economic cooperation agreements and a mutual defence pact. The agreements signed in Abu Dhabi built upon the July 2020 convening of the Greece-UAE Expanded Strategic Cooperation Forum, which resulted in the signing of several bilateral agreements and MoUs concerning innovative small and medium enterprises and digital cooperation.⁷⁹ The innovation economy also represents a key area of activity where India and Greece can expand their cooperation and the UAE may be positioned to play a facilitating role as a result of the breakthrough March 2018 MoU between Greece's Hellenic Development Bank of Investments (HDBI) and the UAE's Mubadala Capital Ventures to create a new €400 million (\$640 million)

⁷⁷ Associated Press, "UAE commits \$75 billion towards infrastructure development in India: Commerce Ministry", *Business Today*, 30 July 2018, <https://www.businesstoday.in/current/economy-politics/uae-commits-75-billion-dollar-towards-infrastructure-development-in-india-commerce-ministry/story/280794.html>.

⁷⁸ Dipanjan Roy Chaudhury, "Excellent possibility for India-Israel-UAE trilateral in West Asia: Israel Envoy", *The Economic Times*, 10 October, 2020, <https://economictimes.indiatimes.com/news/international/world-news/excellent-possibility-for-india-israel-uae-trilateral-in-w-asia-israel-envoy/articleshow/78581962.cms>.

⁷⁹ Rola Alghoul and Hassan Bashir, "UAE, Greece host virtual edition of their 2nd strategic cooperation forum", *Emirates News Agency (WAM)*, 25 July 2020, <https://www.wam.ae/en/details/1395302857837>.

investment platform.⁸⁰ With each entity contributing €200 million (\$320 million), the platform seeks to capitalise on innovative and resilient business sectors across the Greek economy.

HDBI, co-funded by the Greek government and institutional investors, invests in capital venture funds that specialise in Greek start-ups and innovative companies. The Abu Dhabi-based, state-owned Mubadala global ventures platform is active in 13 economic sectors in over 30 countries,⁸¹ including in recent investments in the digital telecommunications and retail operations of the Indian conglomerate Reliance Industries.⁸² The synergy between Mubadala's experience and the dynamism of Greece's emerging start-up culture holds promise for the future and could serve as a springboard for Greece to develop multilateral joint production facilities with India and the other Arab-Med Corridor partners. Mubadala, which has already co-invested with Israeli investors in the US and Europe before normalisation, is now eyeing the possibility of joint funds and joint ventures in Israel's innovation ecosystem.⁸³ Building upon the various bilateral joint partnerships, all four countries should work to incentivise multilateral joint ventures to promote the integration of the corridor.

⁸⁰ The Hellenic Development Bank of Investments was known as TANEQ at the time of the MOU's signing. Press Release, "Taneo signs MoU with Mubadala to create EUR 400 million co-investment platform", Mubadala, 28 March 2018, <https://www.mubadala.com/en/news/taneo-signs-mou-mubadala-create-eur-400-million-co-investment-platform>.

⁸¹ "Our Portfolio", Mubadala, <https://www.mubadala.com/en/our-portfolio>.

⁸² Mubadala invested US\$1.2 billion and ADIA invested US\$750 million in Reliance's digital unit Jio Platforms. Saudi Arabia's PIF also invested US\$1.5 billion. Bloomberg, "Saudi Arabia's PIF to invest \$1.5 bln into India's Jio Platforms", *Alarabiya News*, 18 June 2020, <https://english.alarabiya.net/business/economy/2020/06/18/Saudi-Arabia-s-PIF-to-invest-1-5-bln-into-India-s-Jio-Platforms>; Hadeel Al Sayegh, "Abu Dhabi's Mubadala agrees \$853 million deal with India's Reliance Retail", *Reuters*, 1 October 2020, <https://www.reuters.com/article/reliance-mubadala-int-idUSKBN26M6AV>.

⁸³ Saeed Azhar and Davide Barbuscia, "Abu Dhabi's Mubadala seeks Israeli partners on technology investment", *Reuters*, 25 November 2020, <https://www.reuters.com/article/us-mubadala-israel/abu-dhabis-mubadala-seeks-israeli-partners-on-technology-investment-idUKKBN2851YY>.

While Saudi Arabia's PIF has invested in several Indian start-ups,⁸⁴ there remains great potential for Saudi Arabia to support the development of a corridor-wide innovation ecosystem. Although the lack of formal diplomatic relations between Saudi Arabia and Israel detracts from the corridor's development, Saudi Arabia's recently expanded commercial relations with Greece could serve as a vehicle for multilateral partnerships. Mitsotakis' state visit to Saudi Arabia that immediately preceded his UAE visit placed a special emphasis on expanding economic cooperation. Significantly, senior Greek cabinet members responsible for trade and investment accompanied the prime minister. In addition to meeting with Saudi Arabia's King Salman bin Abdulaziz and Crown Prince Muhammad bin Salman, Mitsotakis met the country's Minister of Commerce and Investment Dr Majid bin Abdullah Al Qasabi to discuss the opportunities for PIF to invest in Greece as well as investment opportunities for Greek companies in Saudi Arabia.⁸⁵

Green Energy Manufacturing Value Chains in the Arab-Med Corridor

The green energy innovation economy holds great potential for cooperation across the India-to-Europe Arab-Med Corridor. Disruptive technologies and start-ups are already revealing the potential for establishing green energy manufacturing value chains, particularly in the manufacturing of components for the solar energy and electric vehicle industries. India, known for its International Solar Alliance initiative, ranks fifth worldwide for installed solar power capacity, while the UAE, Saudi Arabia, Greece and Israel are each either regional or global leaders in solar power development.⁸⁶

⁸⁴ PIF has investment in Indian start-ups such as Delhivery, FirstCry, Grofers, Ola, OYO, Paytm and PolicyBazaar; Embassy of India in Riyadh, "India-Saudi Economic and Commercial Relations", Embassy of India in Riyadh, Saudi Arabia, 2020, <https://www.eoiriyadh.gov.in/page/india-saudi-business-relations/>.

⁸⁵ "Meeting of Prime Minister Kyriakos Mitsotakis with Saudi Minister of Commerce and Investment Dr Majid bin Abdullah Al Qasabi", Office of the Prime Minister of Greece, 3 February 2020, <https://primeminister.gr/en/2020/02/03/23176>.

⁸⁶ Mohamed Jameel Al Ramahi, "Abu Dhabi Sustainability Week: India's renewable energy pledges show 'an ounce of practice is worth tons of preaching'", *The National News*, 2 January 2020, <https://www.thenationalnews.com/business/comment/abu-dhabi-sustainability-week-india-s-renewable-energy-pledges-show-an-ounce-of-practice-is-worth-h-tens-of-preaching-1.958512>.

Building on the foundation of its technology development partnership with Israel, India is well-positioned to facilitate multilateral cooperation among the Arab-Med Corridor countries to establish green energy-sector manufacturing plants in India and other corridor countries.

The India-Israel partnership in developing critical, next-generation solar technology would benefit from multilateral joint partnerships and could provide countries across the Arab-Med Corridor a supply chain advantage. In November 2020, the Indian government's Department of Science and Technology awarded funding to two different joint Israeli-Indian research teams involved in developing perovskite solar cells.⁸⁷ Part of the wave of third-generation solar cell development, perovskite solar cells can be significantly more efficient and versatile than conventional silicon cells. Due to the potential of perovskite solar cells for high-efficiency photovoltaic power generation, there is a global race to develop scalable perovskite solar panel manufacturing. Relevant companies from other corridor partners, such as Greece's solar panel manufacturer Solar Cells Hellas, which before the COVID-19 pandemic had been looking to relocate some of its plants overseas,⁸⁸ could be incentivised to participate in joint ventures through multilateral governmental mechanisms.

The recent success of India and Israel's cooperation in developing and manufacturing solar-powered irrigation systems illustrates the potential for multilateral ventures to establish manufacturing plants. India and Israel are embarking on the joint manufacturing of solar-powered pumping and irrigation systems that provide green energy solutions to help India boost its food production. The joint venture partnership between India's agri-tech start-up, Vyoda, and

⁸⁷ One joint team comprises CSIR's (Council of Scientific and Industrial Research) Indian Institute of Chemical Technology, Hyderabad, and the Hebrew University of Jerusalem. The other is CSIR's National Institute for Inter Disciplinary Science and Technology, Kerala, and the Technion Israel Institute of Technology, Haifa. Uma Gupta, "India and Israel to work together on perovskite solar cells and lithium sulfur batteries", *PV Magazine*, 27 November 2020, <https://www.pv-magazine.com/2020/11/27/india-and-israel-to-work-together-on-perovskite-solar-cells-and-lithium-sulfur-batteries/>.

⁸⁸ "7 Greek firms to invest in various sectors in Egypt", *Egypt Today*, 11 November 2017, <https://www.egypttoday.com/Article/3/32023/7-Greek-firms-to-invest-in-various-sectors-in-Egypt>.

Israeli start-up, Agrosolar Irrigating Systems, was facilitated in 2018 by financing from the India-Israel Industrial R&D and Technological Innovation Fund (I4F), itself a joint project of the Indian government's Department of Science and Technology and Israel's Innovation Authority.⁸⁹ Agrosolar previously developed an off-grid solar pumping and irrigation system to allow farmers with small holdings to affordably irrigate one-to-two hectare farms during dry season conditions. Vyoda, a subsidiary company of Indian conglomerate, NR Group, opened a research and development facility in Tel Aviv to utilise Israeli expertise in agricultural and start-up product development.⁹⁰ In 2020, the two companies manufactured 50 pilot units, several of which have been installed at farms in Karnataka.⁹¹ Vyoda is slated to soon begin mass production of the systems in a new production plant in Mysuru for sale in India and elsewhere.

Electric vehicle (EV) manufacturing represents one of the corridor's key future growth sectors as India is expected to become the world's third-largest automotive market by 2026, with passenger car sales reaching upwards of US\$32 billion (\$42.75 billion).⁹² Automotive manufacturing is the leading manufacturing value chain in Morocco's West Africa-to-Western Europe corridor, with approximately 200 companies operating in the country, supplying components to Groupe Renault and Groupe PSA's Moroccan plants.⁹³ The global shift toward carbon-neutral economies powered by renewable and nuclear energy sources means that EVs will rapidly constitute the majority of automotive manufacturing output. The successful creation of an EV manufacturing value chain through the

⁸⁹ Shoshana Solomon, "First India-Israel projects get green light from joint 40 million tech fund", *The Times of Israel*, 30 July 2018, <https://www.timesofisrael.com/first-israel-india-projects-get-green-light-from-joint-40-million-tech-fund/>.

⁹⁰ "About Us", Vyoda, <http://www.vyoda.com>.

⁹¹ "A story of a success with the help of I4F", Israel Innovation Authority, <https://innovationisrael.org.il/en/success-story/story-success-help-i4f>.

⁹² "India Passenger Car Market By Vehicle Type (Hatchback, Sedan, SUV and MPV), By Fuel Type (Petrol and Diesel), By Transmission Type (Automatic and Manual), By Engine Capacity Type (<1000, 1000-1500, 1500-2000 and >2000), By Segment Type (Mini, Compact, Micro, C1, C2, D, E and F), By Region, Competition, Forecast & Opportunities, 2026", TechSciResearch, June 2020, <https://www.techsciresearch.com/report/india-passenger-car-market/1550.html>.

⁹³ Michaël Tanchum, "Morocco's Africa-to-Europe Corridor: Gatekeeper of a trans-regional strategic architecture", op. cit.

establishment of joint venture partnerships to manufacture components would consolidate the Arab-Med Corridor in a cutting-edge sector by harnessing synergies among corridor countries for mutual advantage.

India's large automakers like Maruti Suzuki, Tata and Hyundai as well as smaller competitors are racing to develop cost-effective, domestic EV manufacturing. However, the Indian automotive industry's reliance on expensive foreign-produced components is proving prohibitive, with the primary problem being the cost of lithium-ion batteries. While efforts are being made to produce lithium-ion batteries domestically, the cost of importing relatively rare lithium tripled in the period from 2017 to 2020. India, being the world's second-largest producer of primary aluminium and possessing ample bauxite reserves,⁹⁴ may be better served by using alternative aluminium-based battery technology. In March 2021, state-owned IndianOil launched a joint venture with Israeli start-up, Phinenergy, which has been developing metal-air technology for clean and high energy-density battery systems.⁹⁵ The joint venture, IOC Phinenergy Ltd, will develop and mass manufacture aluminium-air batteries, particularly with an eye on the emerging EV market. The joint venture already has signed letters of intent with Maruti Suzuki, India's largest automotive manufacturer, and Ashok Leyland, India's leading bus manufacturer. Since 2009, Ashok Leyland has been operating a bus manufacturing plant in Ras al-Khaimah, UAE, with an annual production capacity of 4,200 buses.⁹⁶ India should engage the UAE and Israel in promoting EV manufacturing value chain integration, particularly through the establishment of multilateral joint ventures to manufacture components to supply EV assembly plants.

⁹⁴ "Aluminum Facts", Government of Canada, 22 February 2021, <https://www.nrcan.gc.ca/our-natural-resources/minerals-mining/minerals-metals-facts/aluminum-facts/20510>. India is the fifth largest producer of bauxite and possesses the world's eighth largest reserves.

⁹⁵ ANI, "Indian Oil Corporation enters into joint venture with Israeli company Phinergy", *The Economic Times*, 18 March 2021, <https://energy.economictimes.indiatimes.com/news/oil-and-gas/indian-oil-corporation-enters-into-joint-venture-with-israeli-company-phinergy/81561055>.

⁹⁶ "Local Manufacturing Capability", Ashok Leyland, <https://www.ashokleyland.com/en/web/uae/manufacturing-facilities>.

EV component manufacturing also raises opportunities for Greece's integration into the value chain. German-based EV manufacturer, Next.e.Go Mobile, is opening a production facility in Greece as a joint venture with Enterprise Greece, a state agency tasked with promoting investments in Greece. Costing over €100 million (\$\$160 million),⁹⁷ the manufacturing plant will have facilities to produce metal components as well as for final vehicle assembly.⁹⁸ The establishment of EV component manufacturing plants located within the Arab-Med Corridor countries could cost effectively supply companies based in Greece, India and the UAE. In addition to its EV manufacturing sites in Greece, Next.e.GO Mobile also intends to establish a Technology and Innovation Campus (TIC) in Greece.⁹⁹ This TIC could serve as a means to facilitate the integration of Greece, India and the Middle Eastern partners of the Arab-Med Corridor into an EV manufacturing value chain.

There are similar opportunities for Greece to form joint ventures with its corridor partners related to Greece's other green economy projects. One example is the Tilos Project,¹⁰⁰ inaugurated in 2015 and led by the Greek renewable energy developer, Eunice Energy Group, which seeks to convert the island of Tilos into an autonomous green energy zone in the Mediterranean by powering the island entirely on state-of-the-art batteries recharged by solar and wind power.¹⁰¹ Eunice Energy Group will employ its 'Aftonomo'

⁹⁷ George K Andris, "30,000 electric cars will be manufactured in Greece annually", *Greek City Times*, 16 December 2020, <https://greekcitytimes.com/2020/12/16/cars-manufactured-in-greece/>

⁹⁸ Anna Wichman, "Automobile Giant to Build Electric Cars in Greece", *Greek Reporter*, 16 December 2020, <https://greece.greekreporter.com/2020/12/16/automobile-giant-to-build-electric-cars-in-greece/>.

⁹⁹ Press Release, "Enterprise Greece and Next.e.GO Mobile SE Letter of Intent for electric vehicle manufacturing project", Enterprise Greece, 16 December 2020, <https://www.enterprisegreece.gov.gr/en/news/press-releases/enterprise-greece-and-next-e-go-mobile-se-letter-of-intent-for-electric-vehicle-manufacturing-project>.

¹⁰⁰ "Technology Innovation for the Local Scale, Optimum Integration of Battery Energy Storage", European Commission, <https://ec.europa.eu/inea/en/horizon-2020/projects/h2020-energy/storage/tilos>.

¹⁰¹ Iliana Mier, "A small Greek island will become the first in the Mediterranean to run solely on wind and solar power after its businesses have been hindered by blackouts", *Business Insider*, 19 August 2018,

system that enables the intelligent management of energy generated from wind and solar resources.¹⁰² This system could have wider application for India and Greece's Middle Eastern partners.

The EV markets in India and across the rest of Arab-Med Corridor countries are underserved by inadequate charging infrastructure. In India, for example, there were only 650 charging stations in 2019 while the number of charging stations in China stood at over 300,000.¹⁰³ The widespread use of electric cars in India and the rest of the corridor countries require investment in building charging infrastructure. Start-ups in most of the Arab-Med Corridor countries have been engaged in the deployment of charging stations and are at the forefront of developing ultra-fast chargers. In January 2021, Israeli start-up, StoreDot, a Bloomberg New Energy Finance-designated 'Pioneer' company, announced its development of the world's first car battery that can be fully charged in five minutes.¹⁰⁴ In March 2021, the UAE's Ion, a joint venture started in 2018 by Bee'ah and Crescent Enterprises, installed the country's first ultra-fast charging stations on Abu Dhabi's Yas Island.¹⁰⁵ Greece's start-up, MC Chargers, manufactures its line of charging stations. Facilitating joint ventures for the manufacture and deployment of electric charging stations should be prioritised by India and other Arab-Med Corridor governments.

In January 2021, Masdar, Mubadala's renewable energy investment arm, signed an agreement with EDF Renewables Israel to invest in

Sea", *PV-magazine*, 25 April 2017, <https://www.pv-magazine.com/2017/04/25/greeces-first-battery-storage-system-under-way-in-the-aegean-sea/>.

¹⁰² Vasilis Tsimaras, "EUNICE ENERGY GROUP brings the energy autonomy of Tilos... to your home", Eunice Group, <https://eunice-group.com/eunice-energy-group-brings-the-energy-autonomy-of-tilos-to-your-home/>.

¹⁰³ Naina Bhardwaj, "Electric Vehicle Industry in India: Why Foreign Investors Should Pay Attention", *India Briefing*, 11 March 2021, <https://www.india-briefing.com/news/electric-vehicle-industry-in-india-why-foreign-investors-should-pay-attention-21872.html/>.

¹⁰⁴ "Revving up electric car industry, Israeli firm develops 5-minute-charge battery", 19 January 2021, *The Times of Israel*, <https://www.timesofisrael.com/revving-up-electric-car-industry-israeli-firm-develops-5-minute-charge-battery/>.

¹⁰⁵ Varunn Godinho, "Abu Dhabi gets UAE's first ultra-fast electric vehicle charging stations", 28 March 2021, *Gulf Business*, <https://gulfbusiness.com/abu-dhabi-gets-uaes-first-ultra-fast-electric-vehicle-charging-stations>.

Israeli renewable energy projects.¹⁰⁶ A subsidiary of the French utility giant, EDF, it already operates 18 solar energy projects in Israel. Masdar's initial investment will reportedly be US\$100 million (\$134 million) with the amount to increase depending on the number of new projects launched. Masdar in 2019 already invested in Hero Future Energy (HFE), the renewable energy division of India's Hero Group.¹⁰⁷ HFE itself is eyeing international expansion, targetting about 25 per cent of its growth to be in international markets.¹⁰⁸ Following up on the bilateral investments, the governments of the Arab-Med Corridor countries should facilitate investment in multilateral partnerships. Such multilateral partnerships could also provide a framework for Saudi Arabia's ACWA Power, a global leader in solar power development, to participate in green energy value chain integration across the Arab-Med Corridor.

Saudi Arabia's US\$500 billion (\$668 billion) new innovation city, Neom,¹⁰⁹ may also provide opportunities to strengthen cooperation and connectivity across the Arab-Med Corridor. Over 30 times larger than New York City, the state-of-the-art, high technology mega-project and special economic zone is being constructed in Saudi Arabia's northwest Red Sea region and will create enhanced commercial connectivity with nearby Jordan, Egypt and possibly Israel. Slated to be run on entirely renewable energy sources from solar, wind and hydrogen-based power generation,¹¹⁰ green energy-related manufacturing constitutes one of the sectors through which companies in the Arab-Med Corridor could participate in Neom.

India should also look to expand its cooperation with Jordan as an additional avenue for consolidating the Arab-Med Corridor benefitting from Jordan's close economic cooperation with Saudi

¹⁰⁶ Amiram Barkat and Danny Zaken, "UAE fund to invest \$100 million in clean energy in Israel", *Globes*, 21 January 2021, <https://en.globes.co.il/en/article-uae-fund-to-invest-100m-in-clean-energy-in-israel-1001357897>.

¹⁰⁷ "Abu Dhabi's Masdar takes stake in India's Hero Future Energies", *The National News*, 11 November 2019, <https://www.thenationalnews.com/business/energy/abu-dhabi-s-masdar-takes-stake-in-india-s-hero-future-energies-1.936244>.

¹⁰⁸ *Ibid.*

¹⁰⁹ "Neom – A Vision of New Future", NEOM, <https://www.neom.com/index.html>.

¹¹⁰ "Fact Sheet – About the Line", NEOM, <https://whatistheline-newsroom.neom.com/the-line-launch-media-kit-361021>.

Arabia and the UAE. Jordan and Israel are also engaged in water and energy cooperation while Greece has been deepening its ties with Jordan since 2018, when the two countries held their first trilateral summit with Cyprus.¹¹¹ The governments of the Arab-Med Corridor countries should develop a framework to facilitate multilateral partnerships to invest in production sites in Jordan to facilitate its participation in the corridor.

¹¹¹ "Jordan, Cyprus, Greece launch strategic partnership at trilateral summit", *The Jordan Times*, 16 January 2018, <https://jordantimes.com/news/local/jordan-cyprus-greece-launch-strategic-partnership-trilateral-summit>.

Conclusion

India's new Arab-Med Corridor to Europe is an emerging multi-modal, commercial corridor that promises to reconfigure the patterns of trade between the Indian Ocean Region, the Middle East and Europe by creating an arc of commercial connectivity across the southern rim of Eurasia extending from India's Arabian Sea coast to Greece's eastern Mediterranean coast.

With the establishment of rail connectivity from the UAE to Israel's Haifa port, India's maritime connectivity with the UAE could see Indian goods reach the European mainland in as little as 10 days, arriving via the trans-Mediterranean maritime link from Israel's Haifa port to the massive transshipment port in Piraeus, Greece. With freight rail service from Piraeus, Indian goods can reach Europe's major markets and manufacturing centres, cutting the current travel time for India-to-Europe commercial transportation by 40 per cent. Providing the same cost reduction as the most optimistic predictions for the troubled Chabahar-based International North-South Transit Corridor, the India-to-Europe Arab-Med Corridor forms an alternative trans-regional commercial transportation route wherein the ports of the UAE, India's third-largest trade partner, can serve as the Indian Ocean connectivity node. A strategic paradigm shift of enormous geopolitical significance, India's Arab-Med Corridor to Europe carries the potential to become an organising principle of the Eurasian commercial connectivity architecture, transforming India's place in the emerging global economic order.

Despite India's favourable demographics, geography and commercial transportation infrastructure alone are not sufficient to ensure that India will realise its potential as a Eurasian economic power. Commercial corridors only emerge where the requisite large investments in port and rail infrastructure are coupled with an industrial base anchored in manufacturing value chains. Whether India becomes a global leader in forging the 21st century's commercial architecture depends on New Delhi's ability to develop manufacturing value chains in the India-to-Europe Arab-Med Corridor.

India's careful cultivation of multilateral economic cooperation among the Arab-Med Corridor countries is of paramount importance. While India is succeeding in establishing a food corridor to the Middle East and developing hydrocarbon value chain integration through petrochemicals manufacturing, New Delhi has a strategic imperative to anchor its position through multilateral investment partnerships that expand the manufacturing base within the Arab-Med Corridor. India's advance towards a green energy, innovation economy offers some of the most promising avenues for it to engage with Greece, Israel, the UAE and Saudi Arabia in joint ventures that will transform India into a cutting-edge leader of Eurasian connectivity. Utilising opportunities presented by its green energy and innovation economy initiatives, India can anchor itself in an India-to-Europe Corridor through the establishment of joint venture, production facilities with its Arabian and Mediterranean partners. The extent to which it succeeds at industrial value chain integration will determine its role in this new trans-regional commercial architecture and with it, India's strategic standing as a Eurasian economic power.

Recommendations

India should focus on facilitating multilateral investment in manufacturing

India's ability to integrate into the India-to-Europe Arab-Med Corridor depends fundamentally on how it manages its set of foreign partnerships to participate in manufacturing value chains. The India-to-Europe Arab-Med Corridor presents New Delhi with unique opportunities conducive for value chain integration due to existing synergies between India's commercial ventures with its Arab Gulf partners and its commercial ventures with Israel. Utilising these synergies, India should play a leadership role to facilitate multilateral joint venture investments in manufacturing sites in the country and other corridor countries. To secure the corridor's contiguity, India should devote attention to fostering multilateral partnerships to invest in production sites in Jordan to facilitate the latter's corridor participation.

India's food corridor to the Middle East needs to expand multilateral cooperation

The food processing sector is the current centrepiece of India's value chain integration in the India-to-Europe Arab-Med Corridor, reflecting the symbiosis between the Arab Gulf states' strategic need to ensure their food security and India's strategic imperative to increase the value of its food production. One out of every 10 members of India's workforce is employed in food processing. Developing higher value-added, secondary food processing technologies and preventing distribution loss through efficient integration from farm to retail outlets form two of India's highest strategic priorities. India's 'Food Corridor to the Middle East' is being driven by Emirati and Saudi investments of over US\$7 billion (\$\$9.35 billion) that rely heavily on the transformational role that the Indian-Israeli partnership is creating in its agriculture and water management sectors. Indian-Israel joint venture partnerships in these sectors have also led to the establishment of manufacturing plants in India for the manufacture of solar-powered pumping and irrigation systems and precision drip irrigation equipment. India should promote strategic multilateral cooperation between its Arabian Sea and Eastern Mediterranean partners in the food sector and manufacturing in related auxiliary sectors.

India can coordinate multilateral efforts in green energy and innovative technologies

Synergies exist in several other industries, with the most promising synergies to be found in the green energy and innovative technology sectors in the UAE, Saudi Arabia, Israel and Greece. Utilising opportunities presented by its green energy and innovation economy initiatives, India can anchor itself in the corridor through the establishment of production facilities with its Arabian and Mediterranean partners. Components manufacturing for the solar energy and EV industries should receive high priority. Multilateral investments could accelerate Indian-Israeli joint venture progress toward the production of the next-generation, high-efficiency perovskite solar panels and the mass manufacturing of

aluminium-air batteries for electric vehicles, leveraging India's advantage in aluminium production to replace costly lithium-ion batteries. India and the other Arab-Med Corridor governments should prioritise facilitating joint ventures for the manufacture of ultra-fast EV charging stations.

India should coordinate the strategic integration of petrochemicals manufacturing

The development of an integrated hydrocarbon value chain through the creation of petrochemical manufacturing plants forms another important pillar of the corridor. The UAE and Saudi Arabia are investing a combined US\$59 billion (S\$78.84 billion) in India's refining and higher value-added petrochemicals manufacturing. India should coordinate multilateral strategic planning for the manufacture of next-generation thermoplastics to replace heavy metallic structures to supply electric vehicle components, especially in EV batteries and other components, for products manufactured in these corridor countries.

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