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India-EU Connectivity Partnership: Potential & Challenges

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Abstract: India-European Union (EU) relations have been time-honoured and growing. These ties can be improved by boosting bilateral 'physical, digital and people-to-people' connectivity. This discussion paper has looked at different aspects of India-EU connectivity from national, regional and global perspectives. It argues that being democracies, India and the EU could strengthen their shared approach to connectivity through a comprehensive partnership based on the principles of 'access, equity and inclusion' for their mutual benefit and to assist in sustainable development efforts across the world. This is important more so with connectivity measures increasingly becoming geo-economic, geo-political and geo-strategic tools. This discussion paper was prepared in the context of the India-EU Summit that was scheduled to be held in March, 2020. The Summit, however, was postponed due to COVID-19. The paper includes developments on the topic only until February, 2020.

Keywords: Asia-Europe, Connectivity, Global Value Chain (GVC), Infrastructure, Mobility, R&D, Sustainability.

1. Introduction

India and the European Union (EU) have a long-standing relationship. Their ties date back to the 1960s when India was among the initial group of nations to establish diplomatic relations with the European Economic Community, the precursor to the EU. In 2004, their bilateral ties were upgraded to the 'strategic partnership'-level.[1] The EU is the world's leading economy as well as trader in services and manufactured goods. It is also the largest single market in the world, in addition to being the global topper in inbound and outbound international investments (EU, 2019a). With 513 million people,

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the EU is the third largest in terms of population, after China and India. The EU is also the world's largest provider of development aid, as it has given 74.4 billion Euros, along with its Member States, in 2018 for the purpose (EU, 2019b). India is the world's largest democracy and the fastest growing major economy (EU, 2019a). The rise of India, along with that of China, is projected to bring down the share of the EU in global GDP by two per cent from the current level (of 15 per cent) to 13 per cent in 2030. Cooperation with countries, especially the rising and hugely populated India and China – both with a high demand for energy, is crucial for the EU to take forward its efforts on globalisation as well as the success of its initiatives on climate change mitigation (Gaub, 2019).

Stronger India-EU relationship was envisaged in the '*EU strategy on India*'. The strategy recognises India's economic potential, the developmental challenges it faces, and the country's significance in geo-strategy as well as its importance in ensuring the realisation of the Sustainable Development Goals (SDG). The strategy aims for greater and long-term engagement of the EU with India in building 'sustainable and climate resilient infrastructure', expediting the transition to renewable energy as well as in improving digital connectivity. The EU paper makes it clear that the EU considers India as 'a factor of stability in a complex region', and adds that India's diplomatic and security ties with its neighbouring nations and leading regional powers have significant implications for the EU (EU, 2018a). This viewpoint assumes significance as the EU, on the other hand, sees China as a *'systemic competitor'* due to the continent facing several challenges that stem from China's emergence as an 'economic and technological superpower' (EU, 2019c).

With bilateral trade at USD 115.5 billion in 2018-19, the EU is India's top goods trading partner. The EU is India's top export destination and second leading import partner economy. The bilateral trade is well-balanced, with imports and exports at more or less the same level. India is the EU's ninth largest trading partner (with a share of 2.3 per cent of the EU's total trade in goods in 2018). EU-India services trade is also balanced and growing at a steady pace. It had touched USD 42.5 billion in 2018 (with India's exports worth USD 22.7 billion and imports of USD 19.7 billion). India is the sixth largest destination for EU services exports and the fourth largest service exporter to the EU. India is also a beneficiary of the EU's unilateral preferential tariffs for its goods exports under the Generalised Scheme of Preferences (GSP). However, since several Indian export sectors have

become highly competitive, they have graduated out of the EU GSP, while many more will graduate soon due to the same reason (EU, 2019a).

The EU is the leading source of Foreign Direct Investment (FDI) into India. The FDI equity inflows from EU into India from January 2000 to December 2018 were USD 94.94 billion, amounting to nearly a quarter of the total FDI equity inflows into India during that period of nearly two decades (Govt. of India, 2019a). Around 6,000 European companies are located in India directly employing 1.7 million workers and providing indirect employment to 5 million (EU, 2019a). The maximum outbound investments from India went to the EU in FY 2017-18, after Singapore (that fiscal, the EU received 23 per cent or USD 4.3 billion of India's total outward FDI).[2] India has an investment facilitation mechanism to ensure ease of doing business for European investors (EU, 2019a). The above-mentioned investment figures give an indication of the immense potential of India-EU ties.

The factors that have contributed directly and indirectly to greater ease of doing business and reduction in overall trade costs between India and the EU include lower tariffs and non-tariff barriers through trade policy reforms and preferential trade agreements with various countries in the adjoining region (India's pacts with countries in South and South East Asia). Greater economic and political integration of the EU, improvement in trade facilitation measures, the general fall in transportation costs and improved efficiencies have also helped in lowering trade costs (Gaurav and Mathur, 2015). Besides, the reduction in communication costs have aided in bringing down trade costs. However, high costs involved in complying with customs norms and the lack of regulatory harmonisation between India and the EU still adversely impact the overall trade costs (Felbermayr et al., 2017). To address these concerns and to boost bilateral trade and investment, there is already a major effort in the form of negotiation for a broad-based Bilateral Trade and Investment Agreement or BTIA between India and the EU as well as between India and the European Free Trade Association (EFTA) comprising Iceland, Liechtenstein, Norway and Switzerland (that are not in the European Community).

In order to strengthen India-EU trade, investment and overall economic cooperation, it is vital to ensure greater bilateral *physical, digital and people-to-people* connectivity. These include enhanced rail, road, airport, seaport, metro and digital connectivity, energy-efficient and disaster-resilient housing, working space and public infrastructure. They also include better piped water supply, technology-based learning, as well as quality education and

research and strong mechanisms to promote legal migration and short-term mobility of skilled workers. In this regard, India and the EU have over the years worked out various mechanisms (*See Box 1*).

Better connectivity, which involves regional cooperation, helps in boosting trade, attracting greater investments, as well as in bringing down transaction costs and time taken in doing business. It also helps in increasing movement of skilled professionals, developing global value chains, strengthening the role of Micro, Small and Medium Enterprises (MSME), reducing various disparities and in bringing about structural reforms (Brooks, 2016; Fau, 2016).

Box 1: India-EU Timeline with a Focus on Elements of Connectivity

1962: India was among the first set of nations to set up diplomatic ties with European Economic Community.

1983: EU Delegation to India established.

1994: Cooperation agreement inked to take bilateral ties beyond trade and economic cooperation.

2000: The first India-EU Summit took place in Lisbon in June. There have been 14 such Summits and the last one was held on 6 October 2017 in New Delhi. The 15th one was slated for early March 2020.

2001: India and the EU adopted a Joint Vision Statement to promote cooperation in Information and Communications Technology; also ink a pact to cooperate in Science and Technology.

2004: India-EU relationship upgraded to a 'Strategic Partnership' at the 5th India-EU Summit. The year also saw the agreement being inked on Customs Cooperation.

2005: India and the EU adopted a Joint Action Plan (which was reviewed in 2008) to strengthen dialogue and consultation mechanisms in the political and economic spheres, enhancing trade and investment, and bringing peoples and cultures together.

2006: India and the EU inked MoU on Cooperation in Employment and Social Affairs.

Box 1 continued...

Box 1 continued...

2007: In order to diversify and boost bilateral trade, India and the EU began negotiating a bilateral Broad-based Trade and Investment Agreement (BTIA).

2008: India and the EU signed a Joint Declaration on Education for cooperation in higher education. European Business and Technology Centre began operations in New Delhi.

2009: Both the sides adopted a Joint Declaration on Multilingualism. They also entered into a Nuclear Fusion Energy Research agreement.

2012: India and the EU announced Joint Declaration on Research and Innovation Cooperation as well as on Enhanced Cooperation in Energy.

2016: At the 13th India-EU Summit, the leaders adopted a Joint Declaration on Common Agenda on Migration and Mobility (CAMM) that facilitates legal migration on both sides. The Summit also saw the adoption of Joint Declaration on Water Partnership as well as on Clean Energy and Climate Partnership.

2017: In March, the European Investment Bank opened its first South Asia-based office in New Delhi.

2017: In July, with an aim to promote and facilitate investment flows from the EU, an Investment Facilitation Mechanism was established for close coordination.

2017: In October, the 14th India-EU summit was held in New Delhi. India and the EU agreed to intensify their cooperation in the framework of International Solar Alliance (ISA) including training and affordable finances. A Joint Declaration between the Interim Secretariat of the ISA, and the EIB aimed at mobilizing investments for broad-based deployment of affordable solar energy applications across the 121 prospective member countries of the ISA was adopted. India and the EU also agreed to enhance cooperation on Urban Development with participation of Indian States and cities, EU Member States and regions/cities, building for dialogue on issues such as infrastructure, energy, sanitation, and water management and adopted a Joint Declaration on Partnership for Smart and Sustainable Urbanization. During the Summit, the two sides signed a Euro 500 million EIB loan agreement for constructing a new line and 96 new trains for Bangalore Metro Phase-II project.

Box 1 continued...

Box 1 continued...

2018: In February, the Horizontal Agreement on Civil Aviation between India and the EU, which was signed in 2008, became operational. The pact aims to boost bilateral travel and tourism.

2018: In December, the EU adopted a Joint Communication that sets out the EU's vision for a strategy to strengthen cooperation and partnership with India in the long term.

2019: India and the EU reaffirmed at the High-Level Dialogue on Migration and Mobility that migration and mobility are crucial aspects of the bilateral strategic partnership. Both sides exchanged views on initiatives that can further boost cooperation. They also jointly held a seminar on Sharing of Good Practices on Migration Governance before the Dialogue.

Source: Author's compilation from EU (2013a), Govt. of India (2019c), Govt. of India (2017b), Govt. of India (2016a).

Challenges

However, it must also be noted that most European countries were ranked well above India in various global indices that have elements relating to connectivity. India was placed 44th in a list of 160 economies, in the World Bank's Logistics Performance Index 2018 that ranks countries based on their performance in trade logistics (on parameters including tracking and tracing, timeliness, logistics competence, international shipments, infrastructure, and Customs norms) (World Bank, 2018). In the DHL Global Connectedness Index (GCI) 2018, India was ranked 74th out of 169 economies while eight of the top 10 nations were from Europe making that continent the 'world's most globally connected region' (DHL, 2019).

Similarly, in the World Economic Forum's Global Competitiveness Report 2019, ten of the top 20 economies were from Europe, while India's ranking slipped by ten places from the previous year to 68th out of 141 economies. Among the various parameters measured by the report were infrastructure (that evaluated *transport infrastructure* including road connectivity, quality of road infrastructure, railroad density, efficiency of train services, airport connectivity, efficiency of air transport services, liner shipping connectivity, efficiency of seaport services; and *utility infrastructure* including electricity access, electricity supply quality, exposure to unsafe drinking water, reliability of water supply); ICT adoption (including mobile-cellular telephone subscriptions, mobile-broadband subscriptions, fixed-broadband internet subscriptions, fibre internet subscriptions, and internet users); as well as skills (including current workforce, future workforce and

their skills). India was ranked 70th under the 'infrastructure' pillar, 120th under the 'ICT' pillar and 107th under the 'skills' pillar (WEF, 2019).

Even though countries including India that are a part of Asia Pacific have been experiencing economic growth and prosperity due to an increase in international trade and investment as well as the Global Value Chains, the ensuing benefits have not been shared in an equitable manner. This has resulted in a situation where many have been suffering due to inadequate access to the various elements of connectivity including those related to energy, digital technology and transport (UNESCAP, 2014).

While the EU aims to play a greater role in the arena of connectivity in Asia including in India, it would be vital for the developed-country bloc to recognise the existing disparities between India and the advanced members of the EU so that a win-win India-EU connectivity strategy can be formulated. In this regard, it would be crucial for the EU to recognise the need for developing the latest technology including know-how, capacity building and skilling in India itself to help find innovative, cost-efficient, resilient, replicable and scalable connectivity solutions.

This report covers definitional aspects of connectivity; major global connectivity initiatives; the connectivity principles of India and the EU; an overview of connectivity-related initiatives of India and the EU; potential for India-EU collaboration on connectivity within India and the EU as well as externally/globally; the regulatory norms and issues related to connectivity in India and the EU, as well as connectivity-related agreements of India and the EU.

2. Connectivity - Definition, Elements and Major Global Initiatives

The term 'connectivity' refers to a multifarious concept covering various categories of networks that are accessible and resilient. It has 'hard' (physical infrastructure and various networks including those related to energy and digital connectivity that are involved in social and economic development) and 'soft' (legal, financial, policy and regulatory frameworks) facets. These facets aim to promote growth by increasing interactions, lowering costs, enhancing productivity, efficiency and competition with improved access to various markets (GICA, 2018). By strengthening connectivity, a nation or a region can ensure greater efficiency in the use of their comparative advantages, and reduce inequalities as well (Rodrigue, 2020).

Under the Asia-Europe Meeting[3], the various dimensions of the term 'connectivity' include economic, political, institutional, digital, financial, people-to-people and socio-cultural aspects (*Also see Figure 1*). It encompasses links related to transport (road, rail, maritime and aviation), trade, finance, energy, language, education, research, human resource development, tourism, culture, migration as well as facilitation of trade, investment and customs. In this regard, it includes measures that help in developing and strengthening relations between the peoples, societies and countries, as well as in providing greater access to all for bridging the gap in Asia and Europe in the areas of development and capacities (EU website on ASEM Sustainable Connectivity Portal).

One of the main factors necessitating better connectivity between various regions is the growth in the Global Value Chain (GVC) model, where production is fragmented across the world thanks to major factors such as an efficient services network as well as an increase in services content in manufactured goods (UNIDO, 2018). Connectivity encompasses aspects including physical or economic (including those related to transport, trade, energy, digital, finance), people-to-people (tourism and culture, capacity building etc), and institutional (for ease of doing business and regulatory cooperation) (Okano-Heijmans and Sundar, 2018).

The swift pace of technological changes is constantly challenging most aspects of connectivity as well as their governance. However, technology has helped connectivity to become 'smart' and interconnected. This has, in turn, made it imperative for policy makers to step out of a silo approach of the governance of connectivity and its elements including logistics and various modes of transport. It has now become crucial to instead adopt a *comprehensive model of governance for the entire connectivity ecosystem* for ensuring better delivery of various public goods services and maximise benefits from the same. In this regard, what would help is an integrated approach that incorporates '*holistic mobility planning*' (relating to '*efficient movement of people and goods*'). Such an approach to planning would have to: *(i) take into account ways to integrate passenger and freight transport across various modes (including on land, water and air) as well as housing and other social amenities; (ii) place emphasis on environment and people's health and safety; and (iii) include solutions that can help in making suitable changes for future scenarios* (Govt. of UK, 2019).

Figure 1: Indicators under the ASEM Indices for Connectivity (measuring cross-border connectivity) and Sustainability (measuring sustainability-linked connectivity)

ASEM Connectivity Index framework of indicators	
Physical	1. Logistics Performance Index 2. International flights passenger capacity 3. Liner Shipping Connectivity Index 4. Border crossings 5. Trade in electricity 6. Trade in gas 7. Average connection speed 8. Population covered by at least a 4G mobile network
Economic/Financial	9. Trade in goods 10. Trade in services 11. Foreign direct investment 12. Personal remittances (received and paid) 13. Foreign portfolio investment liabilities and assets
Political	14. Embassies network 15. Participation in international intergovernmental organisations 16. UN voting alignment
Institutional	17. Cost to export/import 18. Mean tariff rate 19. Technical barriers to trade 20. Signatory of TIR Convention 21. Regional trade agreements 22. Visa-free or visa-on-arrival
People-to-people	23. International student mobility in tertiary education 24. Research outputs with international collaborations 25. Patents with foreign co-inventor 26. Trade in cultural and creative services 27. Trade in cultural goods 28. Tourist arrivals at national borders 29. Migrant stock 30. Common language users
ASEM Sustainability Index framework of indicators	
Environmental	31. Renewable energy in total final energy consumption 32. Primary energy use per capita 33. CO_2 emissions per capita 34. Domestic material consumption per capita 35. Net forest loss
Social	36. Population living below the international poverty line 37. Palma Index 38. Tertiary graduates 39. Freedom of the press 40. Tolerance for minorities 41. Presence of international non-governmental organisations 42. Corruption Perceptions Index 43. Female labour-force participation 44. Women's participation in national parliaments
Economic/Financial	45. Public debt as a percentage of GDP 46. Private debt, loans and debt securities as a percentage of GDP 47. GDP per capita growth 48. R&D expenditure as a percentage of GDP 49. Proportion of youth not in education, employment or training

Source: EU website on ASEM Sustainable Connectivity Portal.

Japan had pushed the concept of '*Society 5.0*' at the G20 held in Osaka in 2019. The concept aims to make a 'super-smart society' using solutions aided by technological innovations (including Big Data, robotics, Artificial Intelligence and Internet of Things) to transform infrastructure, mobility, fintech and healthcare. It talks about promoting solutions such as autonomous driving vehicles for public transportation, as well as the use of drones and 'single driver cargo truck in a convoy using unmanned-following vehicle system' in the logistics sector. In the infrastructure space, the concept pitches for the use sensors, robots and Artificial Intelligence in the operation and maintenance of roads, tunnels, bridges and dams. During the Osaka G20 Summit, there was also a ministerial statement on supporting initiatives to improve connectivity infrastructure (including 5G, fibre optic cables as well as other technologies for ultra-high speed connectivity) and broadband access to help in the development of the digital economy and in achieving the Sustainable Development Goals (G20, 2019).[4]

While greater physical and digital connectivity, or what is even termed as *'hyper-connectivity'*, would lead to greater interdependence and inter-connectedness, there is also the risk of countries - which have the economic and political muscle to take the lead in building connected infrastructure across the world - abusing their influence to ruthlessly push their agenda by exploiting or arm-twisting the rest. Therefore, there is a need to pursue *'connectivity diplomacy'* to create institutional mechanisms that can ensure transparency in the decision-making process, functioning and impact assessment of these mega connectivity projects. Such an exercise can make sure that every country in the connectivity chain benefits in an equitable manner from all the new opportunities arising from these connectivity projects. Else, there would be suspicions of a few countries cornering greater gains and enhancing their global influence from the connectivity projects that they themselves helped initiate. This could, in turn, lead to conflicts and make the whole exercise of boosting connectivity counter-productive (Leonard, Ed., 2016).

A look at some of the major proposed/ongoing connectivity initiatives across the world (by India as well as with direct and indirect links to India's interests) listed below shows several inter-linkages between these initiatives and the overlaps in the interests of the major players involved in them (See Box 2):

Box 2: Some Major Proposed/Ongoing International Connectivity Initiatives

(a) *The International North South Corridor (INSTC)* by India, Iran, Oman and Russia to boost transportation cooperation and connectivity with Central Asian and North European countries (Govt. of India, 2015a).

(b) China's *Belt and Road Initiative* (or *BRI* – to connect Asia with Europe and Africa through various maritime and land networks) (Govt. of China, 2019).

(c) Project to *link China's BRI with the Russia-led Eurasian Economic Union (EAEU)* (TASS, 2019).

(d) *India-Japan initiative to establish an Asia-Africa Growth Corridor (AAGC)* for quality infrastructure to link Asia and Africa (Govt. of India, 2016b).

(e) India's *Act East Policy* that includes various connectivity projects in India's North Eastern region and its links with neighbouring countries including Bangladesh and Myanmar; the Kaladan Multi Modal Transit Transport Project as well as the India-Myanmar-Thailand trilateral highway (and plans to extend it to Vietnam via Cambodia and Laos) to link its extended neighbourhood in the East (Govt. of India, 2019d).

(f) Japan's *Partnership for Quality Infrastructure (PQI) in Asia* where the Japanese government, together with the Asian Development Bank, promised an investment of USD 110 billion for quality infrastructure projects in Asia during 2015-2020 (Govt. of Japan, 2015).

(g) Japan's *Free and Open Indo-Pacific Strategy* (FOIP) with elements including boosting connectivity by promoting projects such as *Southern Economic Corridor, East-West Economic Corridor and Yangon-Mandalay Railway* in the ASEAN region; *North East Connectivity Improvement Project and Delhi Mumbai Industrial Corridor* in India*, and Bengal Bay Industrial Growth Zone* in South West Asia; and linking South East Africa and South East Asia via South West Asia and the Middle East through Mombasa port/Northern Corridor and Nacala Corridor projects (Govt. of Japan website on FOIP).

Box 2 continued...

Box 2 continued...

(h) *EU-Japan Partnership on Sustainable Connectivity and Quality Infrastructure* for cooperation on connectivity and quality infrastructure with partner third countries in Western Balkans, Eastern Europe, Central Asia, Indo-Pacific, and Africa (EU, 2019d).

(i) Trans-European Transport Network (TEN-T) (EU, 2019e). This was set up in 1991 to strengthen transport links between the EU Member nations, but is currently being extended to several countries outside the EU. An estimated 500 billion Euros is required during the 2021-2030 period to complete the TEN-T core infrastructure and 1.5 trillion Euros to finish the entire network by 2050 (EU, 2018b). (Around 315 billion Euros mobilised till July 2018).

(j) The EU-China Connectivity Platform that includes projects in the EU and China. The Platform aims to build on the synergies between the approaches to connectivity of the EU and China, including in the TEN-T and BRI projects. (EU, 2018c; also see the EU website for the details on the Platform).

(k) Cooperation announced in July 2018 between Australia's Department of Foreign Affairs and Trade, the Japanese Bank for International Cooperation and the United States Overseas Private Investment Corporation for infrastructure investment in the Indo-Pacific (Govt. of Australia, 2018).

3. Connectivity Principles of EU and India

The EU is keen on enhanced connectivity with Asia, including India. However, it wants the engagement on this aspect to be based on 'sustainable, comprehensive and rules-based connectivity both at strategic and operational levels' (EU, 2018d, e, f and g). This would imply that the focus would not only be on national or bilateral issues, but would also include regional and global matters.

*Okano-Heijmans and Sundar elaborates that the **aspects of 'sustainable connectivity'** include the following: (i) Commercial sustainability: Investments should be made in projects attuned to real public requirements and made in a manner that is economically viable; (ii) Environmental sustainability: Connectivity should be mindful of its environmental impact (While it is important to cater to the present developmental needs, care must be taken to ensure that projects do not adversely impact the lives of future generations); (iii) Financial*

sustainability: Making sure that nations are not victims of debt trap (Also, long-term financial planning should be built into infrastructure projects to ensure enough funds for skills development as well as repair and maintenance work); (iv) Reciprocal connectivity: is not only about ensuring a level-playing field among countries but also to make sure compliance with global norms on government procurement and state aid (Inter-governmental cooperation and private sector involvement are crucial in this regard); and (v) Social sustainability: focusing on projects contributing to institutional quality and compliance with labour and transparency norms (Okano-Heijmans and Sundar, 2018).

A close look at ***the EU-Japan Connectivity Partnership Agreement*** shows these elements in the pact. The agreement mentions, among other things, the promotion of free, open, rules-based, fair, non-discriminatory and predictable regional and international trade and investment, besides transparent procurement practices. It also seeks to ensure of debt sustainability as well as the high standards of economic, fiscal, financial, social and environmental sustainability. The pact has a regional and global focus as it specifies that both the parties 'would work together on all dimensions of digital connectivity, transport, energy and people-to-people exchanges connectivity that would not only be bilateral in nature but also multilateral (in Western Balkans, Eastern Europe, Central Asia, Indo-Pacific, as well as in Africa)' (EU, 2019d).

At a broader level in Asia, the EU has recognised the need for greater connectivity owing to the huge amount of bilateral trade (annual EU-Asia trade is around USD 1.5 trillion) as well as due to the fact that both the continents account for more than 60 per cent of the global GDP (EU, 2018e).

The EU's Asia connectivity strategy reveals that the EU wants Euro-Asian connectivity projects to be *sustainable, comprehensive and rules-based* so that it brings direct benefits to people, both in the 'end point' countries and in countries of transit. It also wants such projects to help in *decarbonisation, digitalisation*, as well as in bringing about *fair competition*, greater investment and innovation. To ensure this, the EU is working on connectivity strategies with *China's Belt and Road Initiative, the Free and Open Indo-Pacific strategies of Japan and the U.S., as well as the Connectivity 2025 of the Association of Southeast Asian Nations (ASEAN)*. The EU has acknowledged differences in its approach and implementation of connectivity projects with that of China, but is keen that both their initiatives work well together. The EU wants to ensure that systems and networks

of all connectivity projects are *interoperable*, and therefore, is engaging with China through a bilateral Connectivity Platform as well as through multilateral forums to create synergies and to find commonalities. The idea is to work with international organisations to set and enforce global rules and standards, which will create a level playing field and equal opportunities for all (EU, 2018f).

The ***EU and China set up a Connectivity Platform*** in 2015 for: (i) information sharing; (ii) improving cooperation (bilaterally and with third countries) on connectivity initiatives including in TEN-T and BRI as well as on financing options and standards; (iii) establishing sustainable (*environmentally, financially, fiscally and socially sustainable*) and inter-operable infrastructure networks in nations and regions between China and the EU region; (iv) setting up joint studies on possible transport corridors; as well as for (v) identifying issues and finding out ways to address them expeditiously . In order to meet these objectives, meetings of various Chairs and Expert Groups are held annually under the Connectivity Platform umbrella (EU 2019f and g; and EU website for details on EU-China Connectivity Platform).

India's connectivity principles are based on the belief that connectivity projects "should bring greater economic benefits to all in an equitable and balanced manner" and that such projects "must be based on universally recognized international norms, good governance, rule-of-law, openness, transparency and equality." India believes that *'connectivity initiatives must follow principles of financial responsibility to avoid projects that would create unsustainable debt burden for communities; balanced ecological and environmental protection and preservation standards; transparent assessment of project costs; and skill and technology transfer to help long term running and maintenance of the assets created by local communities'.* Expressing reservations about China's BRI, especially its flagship China-Pakistan Economic Corridor project that is proposed to pass through Pakistan-occupied-Kashmir, India has said "*connectivity projects must be pursued in a manner that respects sovereignty and territorial integrity*" (Govt. of India, 2017c).

The ***convergence of views between India and the EU on connectivity*** was reflected in the Joint Statement issued after the 14th bilateral summit in 2017. It stated that: "India and the EU acknowledged the importance of connectivity in today's globalised world. They underlined that connectivity initiatives must be based on *universally recognised international norms,*

good governance, rule-of-law, openness, transparency and equality and must follow principles of financial responsibility, accountable-debt financing practices, balanced ecological and environmental protection, preservation standards and social sustainability. Both sides underlined the importance of ASEM (Asia-Europe Meeting) as an informal platform for connecting Asia and Europe" (EU, 2017a).

4. Overview of Connectivity Initiatives by India and EU

Under the ASEM grouping (or the Asia-Europe Meeting comprising 30 European countries and 21 Asian countries including India)[5], connectivity-related issues have been accorded top priority. The ASEM Sustainable Connectivity Portal was developed to assess the 'sustainable connectivity' performance of ASEM member countries.

As per the Portal, India fares poorly (in absolute terms and with respect to the average performance of its peer group – in terms of region, GDP, GDP per capita and population) in most aspects of 'connectivity' (including physical, economic/financial and people-to-people, barring a *slightly better performance in indicators related to political and institutional connectivity*). India is above average in most aspects relating to 'sustainability' (*especially in environmental aspects and an average performance in economic/financial parameters*, but the country registered unimpressive scores in social parameters)[6] (*See Figure 2*).

Figure 2: India's Performance in Connectivity and Sustainability within the ASEM Bloc

Source: EU website on ASEM.

In terms of India's bilateral connections with its ASEM group partners, the ASEM Sustainable Connectivity Portal's indices measures connectivity in terms of physical (international flights passenger capacity, trade in electricity and trade in gas), economic/financial (trade in goods, Foreign Direct Investment and personal remittances - received and paid), political (embassies network and UN voting alignment), institutional (regional trade agreements and visa-free or visa-on-arrival), people-to-people (international student mobility in tertiary education, research outputs with international collaborations, patents with foreign co-inventor, trade in cultural goods, migrant stock and common language users). In this regard, *Table 1* shows India's top European partner country in various aspects of connectivity.

Table1: India's Top European Partner Nations in Various Aspects of Connectivity[7]

India's top European partner nations (in that order)		
	Outflow	**Inflow**
Physical Connectivity		
International flights passenger capacity	UK, Germany, France, Netherlands, Switzerland, Italy, Finland	UK, Germany, France, Netherlands, Switzerland, Italy, Finland
Trade in electricity	NA	NA
Trade in gas	Italy, Germany, Netherlands, UK	Norway, Belgium, Spain, UK, Italy, Netherlands, Switzerland
Economic/Financial		
Trade in Goods	UK, Germany, Belgium, France, Netherlands, Italy, Spain	Switzerland, Germany, Belgium, UK, France, Italy, Netherlands
Foreign Direct Investment	UK, Slovakia, Hungary, Germany, Netherlands, Ireland, Switzerland	UK, Germany, France, Netherlands, Sweden, Finland, Spain
Personal remittances (received and paid)	France, Germany, UK, Portugal	UK, Italy, Germany, France, Spain, Sweden, Netherlands

Table 1 continued...

Table 1 continued...

Political		
Embassies network	Austria, Belgium, Cyprus, Czech Republic, Denmark, Croatia, Bulgaria	Austria, Belgium, Cyprus, Czech Republic, Denmark, Croatia, Bulgaria
UN voting alignment	Cyprus, Switzerland, Greece, Finland, Austria, Belgium, Malta	Cyprus, Switzerland, Greece, Finland, Austria, Belgium, Malta
Institutional		
Visa-free or visa-on-arrival	NA	Austria, Belgium Cyprus, Czech Republic, Denmark, Croatia, Bulgaria
Regional trade agreement	NA	NA
People-to-people		
International student mobility in tertiary education	UK, Germany, France, Italy, Sweden, Netherlands, Ireland	Switzerland, Bulgaria, UK, France, Others, Germany, Italy, Spain
Research outputs with international collaborations	UK, Germany, France, Italy, Spain, Switzerland, Netherlands	UK, Germany, France, Italy, Spain, Switzerland, Netherlands
Patents with foreign co-inventor	Germany, UK, Netherlands, Switzerland, France, Sweden, Finland	Germany, UK, Netherlands, Switzerland, France, Sweden, Finland
Trade in cultural goods	UK, Germany, Spain, France, Italy, Netherlands, Belgium	UK, Germany, Italy, France, Spain, Sweden, Netherlands
Migrant stock	UK, Italy, Germany, France, Spain, Netherlands, Sweden	UK, Germany, France, Portugal
Common language users	Denmark, Ireland Malta, Sweden, UK, Austria, Belgium	Denmark, Ireland Malta, Sweden UK, Austria, Belgium

Source: Author's compilation from EU website on ASEM .

4.1 India

The Indian government, which expects the country's GDP to touch USD 5 trillion by 2024-2025, had identified the development of 'quality infrastructure' as a vital component to ensure that the economic growth is inclusive, broad-based and sustainable as well as to facilitate ease of living. To meet the GDP target of USD 5 trillion, the government had estimated that there was a requirement to spend USD 1.4 trillion during the five-year period till 2024-2025 on economic and social infrastructure projects. The country had invested USD 1.1 trillion in the sector during the period between 2008 and 2017. A high-level panel was constituted by the government to bring out a National Infrastructure Pipeline for every year from fiscals 2020 to 2025 (Govt. of India, 2019e). The government is working on an integrated approach to building infrastructure in India through initiatives such as '*One Nation - One Power Grid, One Gas Grid, One Water Grid, One Mobility Card, One Optical Fibre Network*' ensuring double-digit growth in the infrastructure sector and good return on investment (Govt. of India, 2019f).

Connectivity Initiatives

The government has envisioned India becoming a USD 10 trillion economy within eight years from 2024-2025. The flagship infrastructure initiatives within India include *'Sagarmala Programme'* (for port-led development to bring down logistics cost for local and foreign trade), *'Bharatmala Pariyojana'* (for road development), '*Ude Desh Ka Aam Nagrik (UDAN)-Regional Connectivity Scheme (RCS)'* (to ensure affordable air travel through better regional air connectivity), *'Ujjwal Discom Assurance Yojana (UDAY)*' (to help in the operational and financial turnaround of Power Distribution Companies) (Govt. of India, 2019g). Other physical connectivity initiatives include various Industrial Corridors and Dedicated Freight Corridors, *Pradhan Mantri Gram Sadak Yojana* (for building quality all-weather road connectivity to uncollected habitations to help alleviate poverty) and *Jal Marg Vikas Project* (to develop inland waterways) (Govt of India, 2019h).

The government's *Smart City Mission*, which talks about developing institutional, physical, social and economic infrastructure, also gives focus to connectivity including 'efficient urban mobility and public transport, robust IT connectivity and digitalisation, sustainable environment and assured electricity supply' (Govt. of India, 2015b).

The *'Make in India' initiative* of the government, which aims to boost manufacturing in the country, has a focus on several connectivity-

related sectors. These include shipping, railways, construction, new and renewable energy, automotive and auto components, aerospace, information technology and information technology enabled services. The focus sectors also include Electronics System Design and Manufacturing, tourism and hospitality services, medical value travel, transport and logistics services, communication services, construction and related engineering services, environmental services, financial services and education services. The action plan for several of these sectors were identified to bring out specific measures including fiscal incentives, policy actions for infrastructure creation, ease of doing business, promotion of innovation and Research and Development, as well as skill development (Govt. of India, 2019i).

Some of the other connectivity initiatives that are in the planning or implementation stages include the *National Information Infrastructure (NII)* (aimed at ensuring high-speed connectivity for government departments till the *panchayat* level through the integration of networks and cloud infrastructure). The NII includes the *National Knowledge Network (NKN), Government User Network (GUN), State Wide Area Network (SWAN), the MeghRaj Cloud and BharatNet*. The *Bharat Net programme* aims to 'deliver all government services at the state, district, and gram panchayat level digitally by 2022-23 and eliminate the digital divide'. In addition, there are initiatives such as *Saubhagya scheme* (on household electrification), as well as improving connectivity to the North East (through *Special Accelerated Road Development Programme for the North-Eastern region or SARDP-NE and North-East Road Network Connectivity Project*), hill districts and areas adversely impacted by left-wing extremism. Besides, there is also a focus on improving connectivity to all pilgrimage centres in the Himalayas (through the *Chardham Mahamarg Vikas Pariyojna*), heritage sites and the Buddhist circuit. In this regard development and maintenance are being undertaken through the *National Mission on Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive (PRASHAD) scheme and Swadesh Darshan scheme* (Govt. of India, 2018a).

In the area of *Research and Development*, the government of India-funded *National Automotive Testing and R and D Infrastructure Project (NATRiP)* is a major initiative to help the Indian automotive sector seamlessly integrate itself with the world's best in segments including automotive technology, inspection, maintenance, training and research (see NATRiP website). There is also an incentive scheme called *Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles in India (FAME India)* to boost the electric vehicle ecosystem including its manufacturing, technology

development, charging infrastructure and sales. The initiative is also aimed to reduce the use of fossil fuels in transportation as well as pollution (Govt. of India, 2019j).

The FAME India initiative is part of the *National Electric Mobility Mission Plan (NEMMP) 2020* for promoting environment-friendly transportation and making it affordable in the country (Govt. of India, 2019k). It was estimated that successful adoption of FAME-II and related measures could help "realize EV sales penetration of 30 per cent of private cars, 70 per cent of commercial cars, 40 per cent of buses and 80 per cent of two and three-wheelers by 2030", while "EVs sold through 2030 could cumulatively save 474 million tonnes of oil equivalent (Mtoe) worth 15 lakh crore rupees (or around USD 225.5 billion – at Rs 66.5 to a dollar) and generate net CO2 savings of 846 million tonnes over their operational lifetime" (Govt. of India, 2019l). Around ten states/union territories in India have adopted or are in the process of adopting their own *Electric Vehicle Policy* (ACMA, 2019).

On *road safety*, as part of being a signatory to the Brasilia Declaration since the year 2015, India is committed to bringing down the number of road accidents (501,423 in 2015) and deaths (146,133) by 50 per cent by 2020 (Govt. of India, 2016c). The Motor Vehicles Act has been amended as part of efforts to ensure greater road safety, ensure road-worthiness of vehicles, improve government services and reform the transportation system through measures such as a National Transportation Policy (Govt. of India, 2019m).

In the area of *trade facilitation*, India had in 2016 ratified the World Trade Organisation's Trade Facilitation Agreement and subsequently constituted a National Committee on Trade Facilitation and brought out a National Trade Facilitation Action Plan 2017-2020 with an aim to improve trade-related infrastructure and reduce the overall cargo release time / dwell time for cargo through various measures including the use of digital technologies. The focus on infrastructure includes rail and road infrastructure that has connections to ports and airports as well as infrastructure within airports, ports, Land Customs Stations and Inland Container Depots (ICD). These measures are also aimed at attracting more FDI to India. One of the proposals under the above-mentioned Action Plan was development of air connectivity between Amritsar (Punjab) and Europe (Govt. of India, 2017d).

On the *digital connectivity* front, to take forward its *Digital India* initiative, the government has invited proposals for 5G technology field trials (Govt of India, 2019n). The cumulative economic impact of 5G in the country is estimated to touch USD 1 trillion by 2035. The plan now is to go in for an early roll out of 5G, set up world class research and development

facilities, ensure globally competitive domestic manufacturing capacity in all the related areas and participate in international standards activities (Govt. of India, 2018b).

Opportunities

There are huge opportunities in the *aviation sector* with India projected to be the world's third largest market in the sector by 2024 in terms of the number of passengers. With expenses on Maintenance, Repair and Overhaul (MRO) the second highest after fuel cost, the MRO segment presents major investment opportunities. The *highways* sector also has opportunities, especially since only a quarter of the National Highway network is on four-lane. Another sector with opportunities is building metro rail, particularly with the new Metro Rail Policy aiming to attract private sector investments. The *shipping and ports* sector also is promising for investors with a vast majority of India's trade by volume and value being carried out through the maritime transport mode. The major initiatives include *Sagarmala* (port-led development) National Perspective Plan envisaging the construction of six mega ports; approval for an investment-friendly *revised Model Concession Agreement* as well as *project UNNATI* for improving operations in major ports (IBEF industry reports, 2019).

In the *maritime sector*, in addition to the 12 major ports (six each on the Eastern coast and Western coast) and 205 non-major ports along the 7517 km-long coastline in India, six new mega ports are proposed to be developed in the country under the National Perspective Plan for *Sagarmala.*

Participation of private sector including from overseas in India's ports and port logistics sectors are increasing thanks to factors including: *(i) the growth potential, (ii) better road and rail connectivity to ports, (iii) rising demand for commodities such as coal as well as increasing imports of crude oil and petroleum products (iv) plans for building port-based Special Economic Zones that will house several industries, (v) plans for developing 14 Costal Economic Zones with a focus on manufacturing and job creation, (vi) plans for multi-modal logistics parks and modernisation of ports including through the use of modern technology; (vii) plans for development of dry docks for ship repair facilities (viii) easing of norms including for encouraging private sector participation in areas such as port operations, and terminal and cargo handling; (ix) and allowing 100 per cent FDI in the ports sector (construction and maintenance) through the automatic route, (x) incentives such as tax holidays provided at the federal and state government levels as well as progressive policies such as*

the National Maritime Development Programme and National Maritime Agenda. Private sector players are also helping in the development and operations of many minor ports leading to an increase in cargo handling of minor ports. There are plans also to ensure that renewable energy is used to run all the major government ports; as well as to rank ports on the basis of their performance on cleanliness. These measures can attract investments from Europeans conscious of making investments that promote environment-friendly measures (IBEF, 2019).

Other steps that can attract investment in the sector include the coastal shipping promotion measures including relaxation of cabotage norms for the coastal movement of commodities (including those related to agriculture, fisheries, fertilisers, horticulture and animal husbandry) as well as on coastal movement of specialized vessels, export-import empty containers and trans-shipment containers (Govt. of India, 2019o).

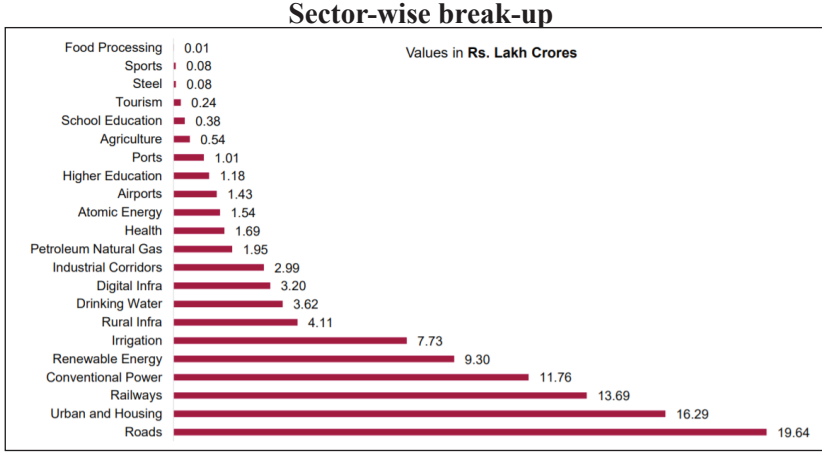
In the *power sector*, there is a target of ensuring *renewable energy* installed capacity of 175 GW by 2022 and plans to raise this later to 450 GW. With India's current installed renewable energy capacity of only 84 GW, the segment offers many opportunities. Other initiatives in the power sector include plans to: *(i) ensure that rooftop solar projects achieve a cumulative capacity of 40,000 MW by 2022; (ii) use the Indian Exclusive Economic Zone (EEZ) along the country's 7,600 km-long coastline for offshore wind power; (iii) boost domestic solar photovoltaic manufacturing; (iv) develop Ultra Mega Renewable Energy Power Parks of around 42000 MW; as well as to (v) intensify cooperation with the International Solar Alliance-member countries* (Govt. of India, 2020a).

The government has set up an interactive platform called *India Investment Grid (IIG)* to showcase various investment opportunities across the country.[8] Currently, the IIG has a list of 5496 opportunities worth USD 217.30 billion and 12,265 investors from 136 countries. The sectors include those related to connectivity including transport, IT and telecom, energy (mainly in the renewable segment), logistics as well as oil and gas. The government of India has compiled a list of infrastructure projects with a project cost of over Rs 50 million since April 2011 that have been completed or under various stages of development. As of 6 December 2019, the list has 9242 projects involving a cost of Rs 68130083.20 million (or around USD 959.58 billion at Rs 71 to one USD). These include government, PPP and private sector projects. Of these, 4411 projects worth a cost of Rs 24302581.10 million (or around USD 342.3 billion) are under construction (Govt. of India, 2019p).

Infrastructure Pipeline

In its report, the task force on *National Infrastructure Pipeline* (of infrastructure projects that can be taken up from 2020 to 2025), estimated that India will need to spend USD 4.5 trillion by 2030 on infrastructure for sustaining its growth rate (*See Figure 3 for sector-wise break-up*). Referring to India's rank of 70 out of 140 countries under the criterion of '*infrastructure quality*' in the World Economic Forum's Global Competitive Index 2019, the report stated that the areas where the country needs to focus on include 'utility (water and electricity) infrastructure' (where India was ranked 103rd out of 141 economies) through efficient implementation of *Jal-Se-Nal* and the *Uday 2.0* programmes. There should also be greater focus on road connectivity (where India was ranked 72nd) through *BharatMala* and *Pradhan Mantri Gram Sadak Yojana* programmes. There should also be greater reliance on technology as proposed under the National Logistics Policy to improve the efficiency of air transport services (where India was ranked 59th), the report said. The report estimates Rs 102 lakh crore (or around USD 1.43 trillion) as the overall project capital expenditure in infrastructure sectors in the country during the fiscals 2020 to 2025 (see Figure 3 for the sector-wise break-up). Of this, projects costing Rs 42.7 lakh crore (or USD 601.4 billion, which is 42 per cent of the total) are under implementation, while projects in the conceptualization stage are worth Rs 32.7 lakh crore (or USD 460.5 billion, which is 32 per cent). The remaining projects are 'under development' (Govt. of India, 2019q).

Figure 3: India's National Infrastructure Pipeline 2020-2025: Sector-wise break-up



Source: Govt. of India, 2019q

Financing Instruments and Monitoring

Among the infrastructure financing instruments initiated by the Indian government were *Infrastructure Investment Trusts (InvITs), Infrastructure Debt Funds (IDFs) and Real Estate Investment Trusts (REITs). Other mechanisms include the setting up of the National Investment and Infrastructure Fund (NIIF), conducting a periodic review of Harmonised Master List of Infrastructure Sub-sectors as well as Viability Gap Funding to promote Public Private Partnerships (PPPs)* in all infrastructure segments (Govt. of India, 2019g). A *Project Monitoring-Invest India Cell (PMIC)*, previously known as Project Monitoring Group, was constituted to ensure expeditious commissioning of large projects in the public, private and PPP segments by fast-tracking the resolution of issues brought forward by various Central Ministries, State Governments as well as project developers (Govt. of India, 2019r). In this regard, an electronic Projects Management System (*eSuvidha*) and a single window system (*e-Nivesh Monitor*) to monitor approvals needed to set up businesses and projects in the country have been developed.[9]

Union Budget 2020-2021

The Union Budget 2020-2021 has also proposed several measures to boost connectivity-related sectors. These include expediting the development of highways (including coastal and land port roads, and economic corridors), as well as a proposal to monetise highways. Development of over 100 airports by 2024 and expansion of air fleet were proposed for the aviation sector. As regards railways, apart from the Mumbai-Ahmedabad high-speed train project, there is a proposal to launch several semi-high-speed trains to link major tourist sites. Also, the land owned by Indian Railways alongside the rail tracks would be used for solar-power generation. Corporatisation and listing of a major port as well as development of economic activity along river banks are the major initiatives proposed under ports and waterways sector. In the power sector, national gas grid expansion and reforms related to distribution companies have been proposed. In the digital sector, the proposals include a policy to enable private sector to set up data centres across the country, scaling up of technology clusters, promotion of quantum technologies and their applications as well as expansion of the rural broadband project. There was also a focus on environment and climate change with proposals ranging from measures to close polluting old thermal power plants, and to take forward the Coalition for Disaster Resilient Infrastructure initiative.

On infrastructure financing, the proposed measures include greater financial support to India Infrastructure Finance Company Limited (IIFCL) and an NIIF subsidiary. The Government proposed to strengthen the International Financial Service Centre at Gujarat International Finance Tec-City so that it can be a global finance and high-end data processing hub. Other measures included a proposal to set up an Investment Clearance Cell for providing "end to end" facilitation and support. The government also promised to release a National Logistics Policy soon with an aim to create a single window e-logistics market; as well as to bring clarity to the roles of the Union Government, State Governments and regulators (Govt. of India, 2020b).

External Connectivity

India's external connectivity initiatives and strategies include the *India-Myanmar-Thailand Trilateral Highway* (Govt. of India, 2019s) and the proposed extension of this trilateral highway to Viet Nam via Cambodia and Laos (Govt. of India, 2018c), both under the *Act East Policy* (Govt. of India, 2017c).

Then there are initiatives including the multi-modal *International North South Corridor (INSTC)* (Govt. of India, 2015a), the *Turkmenistan-Afghanistan-Pakistan-India (TAPI) Gas Pipeline Project* in the energy sector (Govt of India, 2015c) and the Chabahar Port in Iran - all under the *'Go West' strategy* to have better links with Central Asian countries. Multimodal linkages with Myanmar and Bangladesh are being developed under India's *'Neighbourhood First' policy*. In the South Asian region, there is the Bangladesh, Bhutan, India and Nepal (BBIN) initiative to boost efficiency in the logistics sector (Govt. of India, 2017c). Other major global initiatives that cover various connectivity aspects include the *Asia-Africa Growth Corridor (AAGC)* for quality infrastructure to link Asia and Africa (Govt. of India, 2016b) and *SAGAR* (an acronym for *'Security and Growth for All in the Region*' and also meaning *Ocean*) aimed at the Indian Ocean region (Govt of India, 2015d).

India is a signatory to the '*Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention, 1975)*' or TIR. The TIR is a global Customs transit system with the backing of the United Nations Economic Commission for Europe (UNECE) and aims to facilitate trouble-free movement of goods within and among the Contracting Parties to the Convention. As on January 2020, the TIR has 76 Contracting Parties including the EU (UNECE's web link to TIR and UNECE, 2018).

4.2 The EU

The *Connecting Europe Facility (CEF)* is the flagship financing initiative to help in developing trans-European connectivity networks in energy, transport and telecommunications. Investments in these sectors are made with an aim to boost social and economic integration across the EU. In this regard, various issues including regional imbalances, accessibility problems and differences in standards and regulations are being addressed to ensure that growth is inclusive and sustainable. A great deal of attention is being given to efforts to reduce greenhouse gas emissions and to make the EU a circular economy. The CEF has a budget allocation of 30.5 billion Euros for the 2014-2020 period. The CEF programme along with other public sector funds and private finance will ensure that the European economy gets a total of 55.5 billion Euros of investment. The facility is also used to implement the *Trans-European Network for Transport (TEN-T), Trans-European Networks for Energy (TEN-E) and Digital Single Market (DSM) Strategy*, with a focus on sustainability, safety and interoperability across borders (EU, 2019h). The TEN-T currently includes 115,000 km of roads, 125,000 km of railways and 16,000 km of inland waterways, with the year 2030 as the deadline for completion of its core network and 2050 as the target to develop its comprehensive network. Around 550-600 billion Euro is the estimated financial requirement till 2030, for which contribution would be required from public and private sectors (EU, 2019i).

The EU also has an 80 billion Euro research and innovation programme (the EU's largest ever such programme) called *Horizon 2020* for the 2014-2020 period in transport and energy sectors. The focus areas include smart, green and integrated transport; secure, clean and efficient energy as well as smart cities and communities. *Horizon 2020 Transport* covers automated road transport, logistics, aviation, rail, blue growth, road, green vehicles, safety, infrastructure, urban mobility, intelligent transport systems, and waterborne transport, while *Horizon 2020 Energy* covers biomass, bio-fuels and alternative fuels, smart cities and communities, carbon capture and storage, power plants, social dimension of energy, geothermal energy, solar energy, grids and storage, energy systems, tidal, wave and hydropower, heating and cooling, wind energy and shale gas.[10]

Around two-thirds of Europe's external trade and over one-third of trade within the Europe happens through seaports (*Also see Box 3*). There are over 1,200 seaports in the EU and around 329 such ports are part of

the Trans European Transport Network. A 2017 study had estimated that the EU ports would need an investment of around 48 billion Euros in the next ten years. To boost multi-modal connectivity, the TEN-T strategy envisages connecting core sea ports with road, railway and inland waterways transport infrastructure (wherever possible) of the TEN-T by 2030-end. Of this target, all seaports of the Core and Comprehensive Network have been linked to the rail network of the TEN-T. Increasing digitalisation and the necessary regulation is helping in the move towards a European Maritime Single Window Environment to ensure greater operational efficiency and competitiveness (ESPO, 2019).

Box 3: Leading European Seaports and Airports

Seaports:Rotterdam, Antwerpen and Hamburg (on the North Sea coast), followed by Amsterdam, Algeciras and Marseille were the six largest freight ports in the Europe in 2017. The Netherlands, Spain, the UK, Italy, France and Germany were the top six maritime freight transport nations in the EU that year. In 2017, around 415 million passengers passed through EU ports, of which the majority were ferry passengers and 3.4 per cent were cruise passengers. The six largest European passenger ports were Helsinki, Dover, Tallinn, Messina, Calais and Stockholm (EU, 2019j).

Airports: When it comes to air transport, the UK, Germany, France, Spain, Italy and the Netherlands were the leading European nations in international extra-EU air passenger transport in 2018. The international extra-EU passenger air transport accounted for 37 per cent of the overall air passenger transport in the EU, while the remaining share went to intra-EU (46 per cent) and national (16 per cent). *The Indian subcontinent had only a two per cent share of the overall extra-EU air passenger transport, but the region recorded a 12.7 per cent year-on-year growth in 2018.* The top European airports in international extra-EU air passenger transport were London (Heathrow), Paris (Charles de Gaulle), Frankfurt (Main), Amsterdam (Schipol), Madrid (Barajas), and London (Gatwick). In international extra-EU air freight and mail transport, the top European nations were Germany, the UK, the Netherlands, France, Belgium and Luxembourg (EU, 2019k).

Source: EU.

The EU's Asia connectivity strategy has an over 8 billion Euro-funding for achieving its connectivity objectives in Asia during the 2014-2020 period (see *Figure 4* for some major connectivity initiatives of EU to improve links with Asia). This includes funds for ASEAN's Master Plan on Connectivity and the educational exchange programme ERASMUS+. The EU funding of 300 million Euros for the 2010-2016 period, under its Asia Investment and Central Asia Investment facilities, has leveraged around 2.5 billion Euros of investments. If the Council of the EU and the European Parliament agrees to the European Commission's proposal to hike the EU's external action budget to 123 billion Euros for the 2021-2027 period (which includes an investment framework for external action, with an increased fire-power of up to 60 billion Euros), it will help in leveraging additional financial resources for sustainable development from the private sector and in making a significant contribution to the EU's commitment to enhancing Europe-Asia connectivity (EU, 2018d).

5. India-EU collaboration

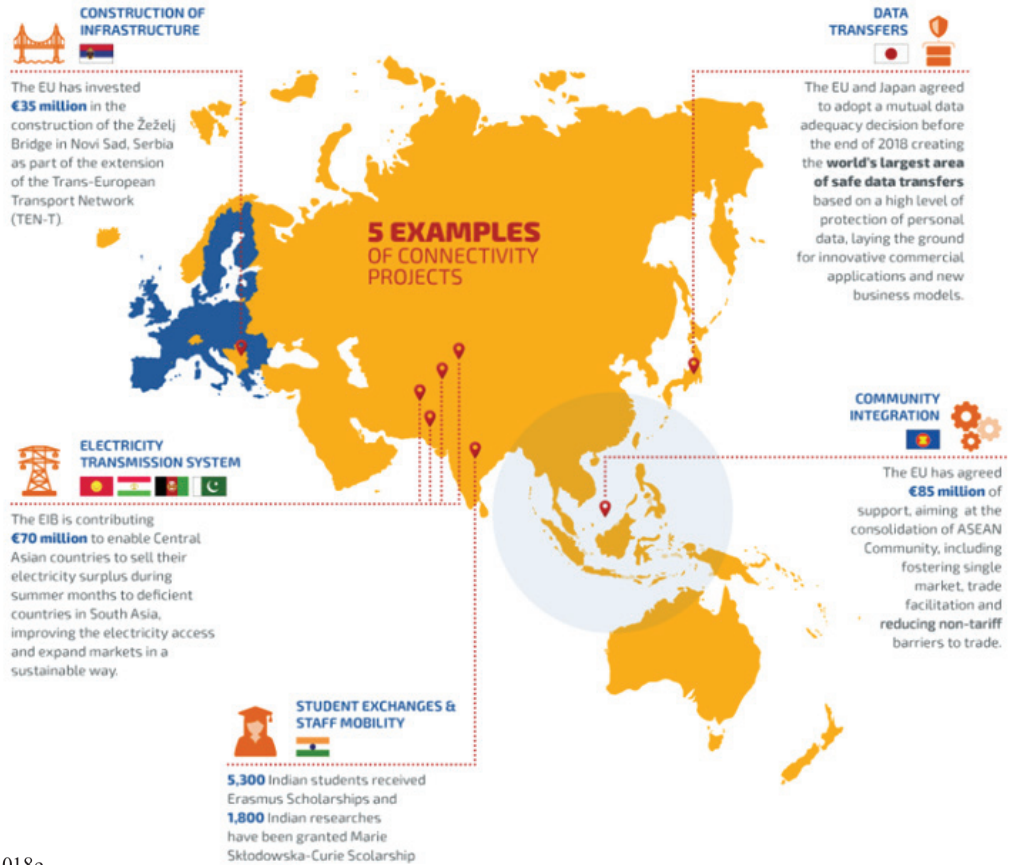
5.1. Within India and in the EU

Various connectivity-related issues have been the focus of many India-EU discussions. There have been deliberations on cyber security and maritime threats, the establishment of European Investment Bank (EIB) office in India as well as the EIB's investment in projects including in urban mobility and renewable energy. There are also ongoing India-EU collaborative efforts in India's *Smart City Mission* and other initiatives including *Make In India*, *Digital India*, *Start-up India*, *Swachh Bharat* (*Clean India*) and *Namami Gange* (*for cleaning and rejuvenating the river Ganga*). Besides, both the sides also have a *water partnership*. In addition, there are over 50,000 Indian students currently studying in various European Universities, thanks to various research and technology partnership initiatives as well as EU's scholarship programmes such as *ERASMUS* (Govt. of India, 2017e).

Intellectual Property

With most of the EU member nations among the world's leading innovators (WIPO, 2019), India is keen on transfer of technology from the EU in areas including those related to connectivity. Significantly, *Intellectual Property (IP)* rights protection has gained traction in India-EU ties. In this regard, there have been government-level MoUs on IPRs with European Patent

Figure 4: Some major connectivity initiatives by EU to Improve Links with Asia



Source: EU, 2018e

Office, France, Sweden and UK as well as an IPR awareness generation initiative at the school level through government-level collaboration with the EU Intellectual Property Office (EUIPO) (Govt. of India, 2019t).

According to the World Intellectual Property Indicators 2019 report, India was among the countries that reported the largest year-on-year increase (20.9 per cent) in trademark filing activity, industrial design filing activity (13.6 per cent increase) and patent filings (7.5 per cent increase) in 2018. In patents, trademarks and designs, India was ranked 12th, ninth and 13th respectively in terms of total (resident and abroad) IP filing activity, and ninth, sixth and 12th respectively in terms of resident IP activity. India (with 67.5 per cent non-resident filings) was also among the countries that had a high share of non-resident filings (WIPO, 2019). India also saw its ranking go up by five places (from the previous year) to 52nd in the 2019 edition of Global Innovation Index (measuring innovative activity using indicators such as investment in research and development, international patent and trademark applications, creation of mobile-phone apps and high-tech exports). Since 2011, India has been maintained its position as the most innovative economy in Central and Southern Asia. India is also among the leading countries in the world in ICT services exports, besides housing three (Bengaluru, Mumbai, and New Delhi) of the world's top 100 science and technology clusters (Cornell University et al., 2019). However, the EUIPO's 2019 Status Report on IPR infringement found that India was among the major producers of counterfeit goods (EU, 2019l).

Trade

Connectivity and trade have inter-linkages. Connectivity can act as the driver of trade in cases where regions with poor connectivity get benefits that are derived from trade. Trade would be the driver for enhanced connectivity in cases where regions with better connectivity links are dependent on benefits induced by trade (Rodrigue, 2020). Better connectivity linkages can result in greater cooperation between nations, and consequently result in improved trade facilitation and higher economic growth. Rules-based trade facilitation, thanks to the growing number of trade agreements, has brought down the costs of trade and transport and given a boost to trade as well (World Bank, 2019). India is yet to ink a trade agreement with the EU and the European Free Trade Association (EFTA) countries comprising Iceland, Liechtenstein, Norway and Switzerland *(See Box 4 for details)*.

Box 4: India's Trade and Investment Agreement talks with EU and EFTA: State of Play

In a bid to broaden and deepen bilateral ties, India and the EU had in 2007 launched negotiations for an ambitious and broad-based Bilateral Trade and Investment Agreement (BTIA) covering investment, trade in goods and services, sustainable development, government procurement, competition policy, Sanitary and Phyto-Sanitary (SPS) measures, trade remedies, Technical Barriers to Trade (TBT), trade defence, rules of origin, dispute settlement, customs and trade facilitation, Intellectual Property Rights (IPR) and geographical indications. However, after 15 rounds including the last one in May 2013, the negotiations have been deadlocked (Govt. of India, 2019u).

Several issues remain unresolved. These include India's demand on services market access in areas such as temporary movement of natural persons (mainly skilled professionals from the IT sector) and business process outsourcing in IT/ITeS. India is keen on being recognised as a 'data-secure' country as such a tag could help the Indian IT sector get better access to the EU market, in addition to lowering operational costs. India also wanted the EU to ensure greater predictability and transparency as well as relaxation of SPS and TBT norms.

The EU, on the other hand, had demanded stronger IPR protection including in the pharmaceuticals sector. The EU was concerned about Indian legislation prohibiting patent 'evergreening' (the practice of firms introducing minor modifications to their product just before the patent expiry date in order to extend the period for patent rights) as well as the exclusivity of test data (aimed at protecting data on clinical trials) with an objective to securing Indian industry's interests in low-priced generic drugs and chemicals in India. Another thorny issue was the EU's recommendation of suspension of marketing of certain generic drugs over findings of an Indian pharma research firm's involvement in clinical trial manipulation. The EU is also understood to be keen to get India to open up sectors including government procurement, multi-brand retail, e-commerce, legal services, financial services, and postal and courier services. It also wanted India to do away with data localisation norms, and remove barriers in sectors such as electronics and tyres. Besides, the EU had demanded reduction of tariffs on a host of items including wines and spirits, automobile and auto components.

Box 4 continued...

Box 4 continued...

The EU had also sought protection to all its items with Geographical Indication. Another factor that led to the delay in the India-EU BTIA talks was the uncertainty over the Brexit (Britain's exit from the EU) (D'Ambrogio, 2017; Vandewalle and Saarela, 2016; Ganapathi, 2017). The EU is also keen on the inclusion of a chapter on sustainable development chapter with specific provisions addressing social and environmental issues (EU, 2019m).

Negotiations for a similar BTIA was on between India and the intergovernmental organisation called the European Free Trade Association (EFTA) comprising Iceland, Liechtenstein, Norway and Switzerland (that are not in the European Community). However, that has not progressed after 13 rounds of talks, the last of which was held in November 2013 (Govt. of India, 2019v).

Notwithstanding the impasse in the BTIA talks, India and the European nations as well as the EU held 22 meetings between April 2017 and July 2019 (Govt. of India, 2019w). These meetings as well as the developments in the UK lending certainty to Brexit along with India's decision to temporarily pull out of the proposed mega-regional Free Trade Agreement (FTA), the Regional Comprehensive Economic Partnership (RCEP) (ASEAN, 2019), has given fresh impetus to restart and expedite the talks on the proposed BTIAs with the EU and EFTA. However, developments including Brexit and technological advances in the auto sector (such as electric vehicles as well as connected and autonomous vehicles, and their components including software and batteries) could change the dynamics of India-EU BTIA negotiations. In the area of movement of natural persons in terms of the number of visas as well as in the financial sector, the UK had more to offer than the rest of the EU member states. In the context of Brexit, there will be areas such as people mobility and financial services where both India and the EU will have to carry out a recalibration exercise.

Another issue is the EU's interest in a separate Bilateral Investment Treaty (BIT) with India. India, however, wants the investment protection agreement to be a part of the BTIA. Following instances where foreign investors dragged the Indian government to international arbitration citing the 'losses' they incurred due to reasons including policy changes, India had unilaterally terminated its BITs including with several EU-member nations. The EU had taken up the issue bilaterally saying the validity of India's BITs with the EU member states should be extended till the signing of an India-EU BIT, or else it would adversely impact EU investments into India (Arun, 2016a, b; Arun, 2017).

Source: Author's compilation from Govt. of India, EU and ASEAN reports

India is the ninth leading export and import partner of the EU-28 in merchandise trade, but has a share of only 2 per cent each in the exports and imports pie of the EU-28. The US and China are the two largest export and import partners of the EU-28. The US (21 per cent) and China (11 per cent) are way ahead of India in exports as well as in imports (China with 28 per cent share and the US with 13 per cent). The main items of India-EU trade include machinery and vehicles, chemicals, various other manufactured products, energy products, raw materials and food and drink items. Among the most trade items between India and the EU-28 include connectivity-related items such as motor vehicles and their parts, as well as aircraft and associated equipment (Eurostat, 2019). Expediting the BTIA negotiations and signing a win-win trade agreement can reduce tariff and non-tariff barriers between these countries and can simultaneously lead to greater trade thanks to the reduced logistics and trade costs.

At the World Trade Organisation (WTO) front, where the dispute settlement mechanism is hampered by the deadlock over appointments to the Appellate Body, the EU along with 16 other WTO members, have proposed a solution to ensure a "functioning dispute settlement system". The 17 WTO members, including the EU, suggested the setting up of a "multi-party interim appeal arrangement" to hear appeals of WTO panel reports in disputes among themselves. They, however, have said the arrangement "would be in place only and until a reformed WTO Appellate Body becomes fully operational." The 17 WTO members, including the EU, also said the "arrangement will be open to any WTO Member willing to join it" (EU, 2020). However, India is yet to join the initiative.

Connectivity Sectors In 'Make In India'

Several connectivity-related sectors are among the focus sectors of the *Make In India* initiative. *Table 2* shows that several European companies, who are global majors in those sectors, have their presence in India. Opportunities in those sectors include: *(i) manufacturing of vehicles including electric and hybrid vehicles as well as their parts, electronic items including medical devices and mobile phones; (ii) development of Maintenance, Repair and Overhaul facilities; (iii) building airports as well as Special Economic Zone-Aerotropolises; (iv) Construction of roads/highways (Eastern and Western Peripheral Expressways as well as improving connectivity to the Char Dham pilgrimage centres in the Himalayas), bridges (under the Setu Bharatam programme to build bridges), multi-modal logistic parks, townships,*

resorts, hotels and green buildings; (v) SMAC (Social, Mobile, Analytics, Cloud) solutions and services and Business Process as a Service (BPaaS); (vi) oil and gas technology as well as exploration and equipment-related manufacturing and partnerships; (vii) building, repair and recycling of ships; (vii) inland waterways development and transport; (viii) construction and maintenance of port and harbour; (ix) projects related to high speed trains, dedicated freight corridors, suburban corridors, railway electrification as well as technological solutions for level crossings and safety, and passenger terminals; (x) Green Energy Corridors; (xi) ultra-mega solar power projects; (xii) hydro, thermal and wind energy projects as well as rural electrification; and (xiii) eco-tourism and rural tourism solutions. Among the key sectoral policies that have been taken to strengthen the Make In India initiative include the Automotive Mission Plan 2026 (aiming to take the sector from the current value of USD 74 billion to USD 300 billion and provide employment to 65 million people) as well as the National Policy on Electronics 2019 (manufacture one billion handsets by 2025, attract USD 100 billion worth investment and generate employment for 28 million people) (Govt. of India website on the Make In India initiative).

Table 2: European presence in 'Make in India' Focus Sectors Related to Connectivity[11]

'*Make in India*' Sector Related to Connectivity	**European presence**
Automobile	BMW, Mercedes, Volkswagen, Daimler and Borgward Automotive (all five from Germany), Volvo (Sweden), Piaggio (Italy) and Renault (France).
Automobile components	ZF, FAG and WABCO (all three from Germany), Magneti Marelli (Italy) and Valeo (France)
Aviation	Airbus (France), Rolls Royce (UK), Frankfurt Airport Services Worldwide (Germany) and Fairfax (London)
Construction	Aqualyng (Norway), Alstom (France), and GIZ (Germany)
Electronic systems	Bosch, Continental, 'Giesecke and Deverient' (all three from Germany), Magneti Marelli (Italy) and Philips (Netherlands)

Table 1 continued...

Table 1 continued...

IT and BPM	Accenture (Ireland), Capgemini, Atos and Steria (all three from France), SAP (Germany) and Philips (Netherlands)
Oil and gas	British Petroleum, Cairn Energy and Shell (all from UK)
Ports and shipping	AP Moller Maersk (Denmark)
Railways	Alstom Transport Holdings B.V. (Netherlands) and Inversiones EN Concesiones (Spain)
Renewable energy	Enercon (Germany)Vestas and Nordex (Denmark), Enel (Italy) and Gamesa (Spain)
Roads and highways	Hindustan Construction Company Ltd-Laing Sadbhav Consortium (UK)
Space	Official cooperative arrangements with space agencies of European countries / bodies including Bulgaria, France, Germany, Hungary, Italy, Norway, Spain, Sweden and the UK as well as with European Centre for Medium-Range Weather Forecasts (ECMWF), European Organisation for Exploitation of Meteorological Satellites (EUMETSAT) and European Space Agency (ESA)
Thermal power	GDF SUEZ (France)
Tourism and hospitality	Accor (France), Thomas Cook, Premier Travel Inn and Cox & Kings (all three from UK)

Source: Govt. of India website on the 'Make In India' initiative.

Foreign Direct Investment

There were 22 EU countries/territories out of the top 50 nations (including five in the top 10) from where *Foreign Direct Investment* (FDI) has come into India between April 2000 and September 2019, a reflection of the significant interest across the EU region to make inroads into India through the FDI route (Govt. of India, 2019x).

At the government level, there are *dedicated country desks for France, Germany and the UK*[12] to facilitate investments and help in solving problems. The areas of Indo-French cooperation include 'climate change and environment', railways, smart cities, renewable energy and tourism. India and France are strategic partners in defence, space and civil nuclear cooperation. Both the countries also jointly launched the International

Solar Alliance with an aim to ensure equitable and just global energy order. France also focuses on Research and Development (R and D) with 25 French R and D centres in India and 15 France-India *research laboratories. Over a thousand French companies are housed in India and they have an* aggregate turnover of around USD 20 billion and provide employment to 300,000 people. France has also committed over USD 2.2 billion in India's Smart City Mission and is partnering to develop Nagpur, Chandigarh and Puducherry. There are 120 Indian companies operating in France. They have invested USD 1.1 billion and employ 7,000 people. Germany is another major European partner country for India in the area of connectivity as that country has over 1600 collaborations and 600 joint ventures with India as well as investments in areas including automobiles, transportation and construction activity. There are also India-Germany Joint Working Groups in automobiles, skill development as well as water and waste management. There is a mechanism to fast track resolution of problems faced by German companies in India in addition to the '*Make In India Mittelstand*' programme to boost the presence of German MSMEs in India's manufacturing sector. Both France and Germany also have a major presence of Indian students (Invest India website).

Indo-German cooperation has expanded to new areas such as Artificial Intelligence (AI) and Internet of Things. Both sides are also planning closer cooperation in areas such as digitalisation, start-ups, cyber-security, space, Green Energy Corridors, education and skill development as well as high-speed and semi high-speed rail projects. Green Urban Mobility (including electric-mobility, which refers to the use of electric vehicles) is another priority area in India for Germany and the German government has agreed to provide one billion Euros for the same (Govt. of India, 2019y). To strengthen ties with India, the French government too has prioritised cooperation in areas such as AI, space, cyber-security, renewable energy and education (Govt. of India, 2019z).

Foreign Direct Investment (equity inflows) from EU into India between January 2000 and December 2018 was USD 94.94 billion, or 23.17 per cent of the overall FDI of USD 409.81 billion that India received during that period. FDI inflows from the EU into India had touched a high of USD 15.2 billion in 2011, but have since fallen to USD 7.2 billion in 2018.

The top sectors that received FDI from the EU in that period were: *(i) services sector (USD 13.3 billion, or 14 per cent), (ii) chemicals (other than fertilizers) (USD 9.8 billion, or 10 per cent), (iii) automobile industry*

(USD 6.98 billion, or 7 per cent), (iv) drugs and pharmaceuticals (USD 5.7 billion, or 6 per cent) and (v) construction development (townships, housing, built-up infrastructure and construction development projects) (USD 5.5 billion, or 6 per cent).

The leading EU/ European countries in FDI inflows into India were: *(i) UK (USD 26.5 billion), (ii) Netherlands (USD 26.4 billion), (iii) Germany (USD 11.4 billion), (iv) Cyprus (USD 9.8 billion), (v) France (USD 6.6 billion), (vi) Italy (USD 2.83 billion), (vii) Spain (USD 2.80 billion), (viii) Luxembourg (USD 2.7 billion), (ix) Sweden (USD 1.5 billion), and (x) Belgium (USD 1.3 billion)* (Govt. of India, 2019a).

Some of the top EU companies that invested in connectivity-related sectors during that period are shown in *Table 3*. It shows that no major investment from Europe has come into India's physical infrastructure sectors during the last nearly two decades, apart from some investments in port operation, petroleum refining and energy-related (coal-based thermal power plants and renewable energy). The major inflows are in the digital sector (IT activities, data processing, call centres, computer software, e-commerce) automobiles and cargo handling.

Table 3: Major investments by European Firms in India's Connectivity-related Sectors (2000-2018)[13]

Name of Indian Company	Country	Name of Foreign Collaborator	Item of Manufacture	FDI Inflows (USD million)
Reliance Industries	UK	BP Exploration (Alpha)	Petroleum refining	1,827.93
Cairn (India)	UK	Cairn UK Holding	Business services not elsewhere classified	1,492.82
Siemens	Germany	Siemens Aktienges-ellschaft	Electrical and electronic engineering	1,146.04
Optum Global Solutions (India) Private L	Netherlands	Optum Global Solutions International BV	Other data processing, hosting and related activities	430.24

Table 3 continued...

Table 3 continued...

Cisco Systems India	Netherlands	Cisco Systems Management BV	Other information technology and computer service activities	425.59
Reliance Ports and Terminal	UK	HSBC Bank PLC	Operating port facilities	385.07
Daimler India Commercial Vehicles	Germany	Daimler AG	Manufacture of motor vehicles for transport of goods, manufacture of special purpose heavy motors	377.38 152.24
Serco BPO	Luxembourg	Serco International S.A.R.L	Data processing, software development and computer consultancy services	309.01
Serco BPO	Luxembourg	Serco International S.A.R.L	Activities of call centres	294.85
Daimler India Commercial Vehicles	Germany	Daimler AG	Manufacture of commercial vehicles such as vans, lorries, over-the-road tractors for semitrailers	272.14 236.80 174.56 118.26
Meenakshi Energy	Netherlands	Engie Global Developments B.V	Electric power generation by coal based thermal power plants	269.83
Reliance Holidays and Resorts India	UK	HSBC Bank	Operating port facilities	238.23

Table 3 continued...

Table 3 continued...

Nissan Motor India	Netherlands	Nissan International Holding BV	Manufacture of motor cars and other motor vehicles	230.98
Digital Global Soft	Netherlands	Hewlett Packard Leiden B.V	Computer software	206.64
Renew Power Ventures	Netherlands	Jera Power RN B.V	Electric power generation using other non-conventional sources	200.39
Paytm E-commerce	UK	SB Investment Holding (UK)	Other information service activities	197.88
ONE 97 communications	UK	SB Investment Holding (UK)	Other information service activities	196.02
Man Force Trucks	Germany	Man Truck and Bus AG	Manufacturing of heavy commercial vehicles	186.84
Mundra Port and SEZ	UK	Various NRIs/ FIIs	Services not elsewhere classified	178.84
Vai Metals Technologies	Germany	Siemens Vai Metals Technologies Gmbh	Other specialized construction activities	165.77
Mahindra & Mahindra	Cyprus	Golboot	Motor cars and other motor vehicles	153.86 142.86
Karanja Terminal and Logistics	Cyprus	Karanja Terminal and Logistics Cyprus Ltd.	Cargo handling incidental to land transport	102.46

Source: Author's compilation from Govt. of India, 2019a – only investments of over USD 100 million.

Digital

In the area of *digital connectivity*, India, which is undertaking 5G technology field trials, has taken note of the developments in Europe in this regard. In Europe, 5G pre-commercial trials are being carried out to deliver services related to road and rail transport. European countries have also taken the lead in development of 5G standards, equipment design as well as intellectual property (Govt of India, 2018b).

Interestingly, regardless of the U.S. pressurising its allies including India, the EU and the UK to prevent Huawei from 5G operations on security grounds including espionage concerns, India has allowed the Chinese tech major (along with other network equipment manufacturers) to take part in 5G trials (ET Bureau, 2019; Iyengar, 2019), while the UK and the EU have given the green signal for Huawei to have a limited role in 5G deployment. The UK has only prohibited Huawei from operating in the 'core or sensitive' areas of its 5G network (Kelion, 2020; Sabbagh, 2020; Al Jazeera, 2020), while the EU has also similarly asked its members to bring in curbs to prevent (firms based in non-democratic nations) Huawei's operations in the 'core or sensitive' parts (and not in the non-core areas) of their 5G networks (Stevis-Gridneff, 2020; Horowitz, 2020; Bloomberg News, 2020).

Similarities in the regulatory approaches in the area of 5G can help India and the EU in making collaborative efforts in the area of 5G. Some suggestions for such efforts include: (i) 5G projects in India's rural areas on the lines of the EU-Brazil 5G Range project for accessing 5G network in Brazil's remote areas; (ii) collaboration between the 5G trial initiatives of India and the EU; (iii) tie-ups for harmonisation of 5G standards in India and the EU; and (iv) using India's End-to-End 5G Test Beds initiative (to promote research and innovation on 5G) to organise events on interoperability and hackathons (TSDSI, 2019).

There is already an EU-funded 'India-EU Cooperation on ICT-Related Standardisation, Policy and Legislation" (2015-2020), an initiative that has the endorsement of the 2012 India-EU Summit. It aims to align development and deployment of ICT standards in India and the EU and ensure harmonisation of exchange of statistical data (through cooperation between the EU's Eurostat and India's Central Statistics Office). The priority areas of the initiative are security-related issues, 5G technology and Intelligent Transport Systems. Close cooperation in these areas are being done with a view to promote the standardisation initiatives of India and the EU at the international level and develop applications on the basis

of common standards. It could also bring about greater interoperability and ease of doing business for firms (by avoiding delays due to various factors including differences in certification, testing and labelling requirements), thereby boosting India-EU trade as well as the Make In India initiative to strengthen manufacturing of telecommunication and electronics items in India (website of the India-EU ICT Standardisation Collaboration initiative).

Besides, the 5G Infrastructure Association (5G IA) from Europe and Telecommunications Standards Development Society, India (TSDSI), representing India, have inked a Memorandum of Understanding to promote India-EU collaborations on 5G technology. In the EU's 5G Infrastructure Public Private Partnership initiative, the European Commission represents the public side and 5G IA the private sector. The TSDSI, which brings together the views of Indian stakeholders including the private sector on development of standards for ICT and telecom products in India, is supported by the Indian government's Department of Telecommunications that looks into various telecom policy aspects including those related to 5G. The TSDSI also has an ongoing cooperation with the ETSI (a European Standards Organization dealing with standards on telecom, broadcasting and other electronic communications networks and services). India and the EU - which have existing official mechanisms such as the *EU-India Joint Working Group on ICTs* and the *EU-India Co-operation Dialogue on Digital Communications* - are also looking at cooperating in areas such as Internet of Things/Machine-to-Machine technology, network security as well as testing and certification (EU web link on 'international cooperation on 5G').

An early, efficient and pervasive deployment of 5G in India can help develop innovations in various fields including rural development, agriculture, education, health and manufacturing (Govt. of India, 2018b). The EU has pitched for closer cooperation with India in Artificial Intelligence, 5G, Internet of Things and Big Data on the basis of "fair competition based on global standards", and with an emphasis on free data flow and 'protection of fundamental freedoms in cyberspace' (Fontelles, 2020). The Joint Statement during the 2017 India-EU Summit had called for stronger links between the 'Digital India' and 'Digital Single Market for Europe' initiatives. It had also taken note of the ongoing India-EU cooperation on areas such as internet governance, ensuring greater ease of doing business for Indian and European ICT companies, as well as meetings boosting the Indian and European start-up ecosystems through a 'Start-up Europe India Network' (EU, 2017a).

Aviation

In the field of *aviation*, India has been named an 'important aviation partner' in the EU's 2015 Aviation Strategy for Europe. The Strategy also calls for a new aviation dialogue with India to deepen ties. In 2018, the India-EU horizontal agreement came into force. The pact does away with nationality curbs on aviation and allows *all EU airliners "to operate flights between India and any EU Member State where it is established, and where a bilateral agreement with India exists and traffic rights are available"*. The horizontal agreement, however, does not replace any existing bilateral agreements that India has with EU-member countries, but adapts them in such a manner that they are brought in consonance with the EU law (EU's web link on international aviation). The EU is keen on a comprehensive agreement that covers regulatory cooperation, aviation security and safety, air traffic management modernisation and aspects related to environment (PTI, 2017).

India's 2016 National Civil Aviation Policy also relaxed various curbs on operation of international air services. According to it, India can "enter into an *'open sky' Air Services Agreement*[14] on a reciprocal basis with SAARC countries and countries with territory located entirely beyond a 5000 km radius from New Delhi". The Policy also relaxed norms on domestic and international Code-Share Agreement between two airlines (allows an airline to sell seats on another airline's flight) (Govt. of India, 2016d).

These norms can lead to stronger aviation links with EU as well. India has already entered into an Open Skies Agreement with European countries including Czech Republic, Finland and Spain, as well as domestic code share pacts with Czech Republic and Portugal; and code share with third country carriers and four additional domestic code share points with Spain (Govt. of India, 2016e).

Other issues facing the aviation sector are related to the suspension of operations of private carrier Jet Airways and the privatization of the state-owned Air India. The closure of Jet Airways had impacted exports of fresh fruits and vegetables to Europe (Bhosale, 2019). The development is expected to benefit European carriers including Virgin Atlantic and Air France-KLM that had code-sharing agreements with Jet Airways and are in a position to get a greater share of India's passengers going overseas (Sharma. N, 2019). The growing Indian aviation sector and the space left by Jet Airways are being eyed by several international airlines including from Europe such as the Lufthansa Group airlines (that had a code-share agreement with Jet

Airways) (Abidi, 2019) and LOT Polish Airlines (Moneycontrol, 2019). Jet's closure was also expected to get more suitors for Air India, which, as a full service carrier, has a significant share of international passenger market to and from India (Gupta, 2019). Air India has become attractive also due to its bilateral rights and international slots including in Europe (Kundu, 2018).

The airport development sector in India has also attracted European interest with Switzerland's Flughafen Zürich AG winning the concession (40 year-long) to build and manage a new airport in Jewar, Uttar Pradesh in the National Capital Region. The company presently 'holds 100 per cent of the project'. The company had earlier sold its shares in the Kempegowda International Airport in Bengaluru (Zurich Airport, 2019). Another area with potential is the aviation Maintenance, Repair and Overhaul (MRO) segment. The total fleet in India is expected to grow from 604 in 2019 to 1,547 in 2029 and the country's MRO segment projected to double from USD 2 billion in 2019 to USD 4 billion in 2029. With a growth rate of 7.1 per cent during the 2019-2029 period, India's MRO segment will be the fastest growing in the world after China's 9.7 per cent growth during the same period. However, given India's growing middle class and the potential for growth in the MRO and aviation sector in general, much needs to be done on the infrastructure front to support the MRO industry (Cooper et al., 2019). Owing to the severe shortage of MRO facility in India, a vast majority of the Indian MRO work is currently being carried out overseas (MRO Business Today, 2018). There is however, European interest in the sector in India with companies such as Thales International, Sabena technics of TAT Group and Airbus (all from France) making inroads (GIDB web link on aviation MRO).

Ports

India's *ports sector* is getting the attention of many private players. These include the Denmark-headquartered Maersk that has helped in the development of JNPT (Mumbai) and Pipavav port (IBEF, 2019). What can help in attracting greater investment from foreign players including from Europe into India's ports sector is a plan to focus on a wide range of value-added services for clients at ports, following the example of the Port of Rotterdam that implemented such a strategy and successfully attracted many European Logistics Centres. There is also a need to improve efficiency and bring down logistics costs in India by focusing on methods such as increasing capacity of railways (KPMG, 2008).

Referring to the seamless connectivity at the port and the port area in

Europe due to which cargo is transported across Europe in a smooth manner, India's Maritime Agenda 2010-2020 had proposed a minimum of four-lane road connectivity and double line rail connectivity at Indian ports to help them upgrade to the best ports in the world. The Agenda had also proposed close coordination with the EU along with other international organisations to help in the expansion of Indian ports. The coordination, it suggested, could be done through sister-port agreements with the best ports in the world to help in attracting finance, technology and other best practices to India (Govt. of India, 2011).

Recycling of ships is an area of India's interest as it is a leading nation in the segment with over a 30 per cent share of the global market. Thanks to the passing of the Recycling of Ships Bill 2019 to ensure focus on safe and environment-friendly ship recycling, India should be able to get more business from countries including those in Europe (Govt. of India, 2019aa).

Cruise tourism is a segment with a lot of potential for tie-ups with Europe. India had eased cabotage curbs for ten years to facilitate cruise ships from overseas, including from Europe, to run domestic cruises. An added incentive is the decision to make tariffs of Indian ports comparable to that of ports in Europe (Govt. of India, 2018d). India's bilateral pacts with many EU member countries have curbs on cabotage (with an exception that foreign flagged vessels are permitted to obtain a periodically renewed licence in routes where Indian flagged vessels do not have operations). Cabotage restriction has been the main challenge that is affecting the EU shipping sector's competitiveness in its India operations (Artuso, et al., 2015). However, the relaxation of cabotage curbs by the Indian government now offers scope for greater ties with the EU in this important segment.

With India relaxing restrictions on cabotage (or movement of passengers or goods between two locations in the same nation by a foreign transport operator) for foreign flagged ocean carriers (Govt. of India, 2019o), the country's ports are looking at increased business from mainland vessels. The move has led to an increase in trans-shipment and coastal shipping in India (Mathew, 2019a). It has also led to developments such as a new dedicated mainline direct shipping service between South India and North Europe, where the "port rotation will be Visakhapatnam, Krishnapatnam, Chennai, Tuticorin (V.O. Chidambaranar), Colombo, Cochin, Damietta, Piraeus, Rotterdam, London Gateway, Hamburg, Antwerp, Le Havre, Damietta, Jeddah, Colombo, and back to Visakhapatnam" (Mathew, 2019b; Hellenic Shipping News, 2019).

In the area of container trade, the Indian public sector company

Shipping Corporation of India has an Indian Sub-continent Europe Service covering Felixtowe, Hamburg and Antwerp ports in Europe (Govt. of India, 2011). The ports sector has seen partnerships between Indian and European ports. These include in the area of training (agreement between JNPT, Mumbai and the Port of Antwerp) and an earlier strategic alliance between Port of Antwerp International and Essar Ports from 2012-mid 2015 as well as various other collaborative initiatives by the Port of Antwerp with several stakeholders (Port of Antwerp, 2017 and Port of Antwerp website). JNPT, Mumbai also has a Memorandum of Understanding on long-term strategic cooperation with Peel Ports that owns the Liverpool port in the UK with an aim to bring down costs, congestion and carbon (JOC, 2015). Port infrastructure developer Adani Ports and Special Economic Zone had in 2017 entered into a strategic collaboration with CMA Terminals of the France-based CMA CGM group to jointly operate a container terminal at Mundra Port for 15 years with an option to extend it further (Adani Ports, 2017). Indian port sector can consider tie-ups with European ports stakeholders on use of the latest technologies in the ports and logistics. For instance, the Hamburg Port Authority that has taken major initiatives on Internet of Things through collaborations with companies and has developed a 'smartPort Logistics' technology platform to improve maintenance (Deloitte and ASSOCHAM, 2018).

What can help in boosting India-EU cooperation in the area of maritime security is the fact that India is a signatory to the Ascension Agreement to the Trans Regional Maritime Network (or T-RMN - comprising 30 nations and "steered" by Italy). With this, India will have access to information on vessels passing through the Indian Ocean region (PTI, 2018). Of the White Shipping agreements (on information exchange between navies on ships) that the Indian Navy has to conclude with 36 countries and three multi-national constructs, such pacts have been inked with 19 countries and one multi-national construct, while work is going on to enter into agreements with the rest (Indian Defence Industries, 2018).

Roads and Highways

The Indian *roads and highways* sector is also attracting European interest. The *Masala Bond* issue (Indian Rupee-denominated bonds issued outside India) by National Highways Authority of India (overseeing the development, management and maintenance of India's National Highways for inter-state movement of goods and passengers as well as connecting with border

roads and foreign highways) at the London Stock Exchange had seen the participation of European investors who accounted for 40 per cent of its subscription (Govt. of India, 2017e). Another example of European interest in India's roads sector is the presence of ROADIS, the largest European highway concession manager in India, which currently manages "710 kilometres of highways distributed in four projects, NH1 (NH1Tollway: Panipat-Jalandhar), NH2 (NH2 Tollway: Varanasi-Aurangabad), NH6 (NH6 Tollway: Gujarat-Hazira Port) and NH8 (NH8 Tollway: Kishangarh-Ajmer Beawar), granted by the NHAI" (website of ROADIS). The government of India-backed fund manager National Investment and Infrastructure Fund (NIIF) and ROADIS have set up a platform to invest in road projects in India. They aim to make an investment of up to USD 2 billion of equity to look at the opportunities in Toll Operate Transfer models, and acquire existing road concessions. The plan is to set up a large roads platform in India (NIIF, 2019). Such partnerships and investor interest from Europe could be encouraged to give a boost to the Indian roads sector, which is the second largest in the world (Invest India web link on roads and highways).

Railways

The *railway* sector in India too has seen several engagements with Europe. For instance, there have been projects in India related to European Rail Traffic Management System (ERTMS), which is working on setting up a seamless railway system - including high-speed network - across Europe (EU, 2008) and studies showing the relevance of the 'globally accepted' ERTMS/ European Train Control System or ETCS (which has the needed flexibility for interoperability) in India (Ramana, 2017; Mathur et al., 2018). The Indian Railways Works Programme 2018-19 has included Automatic Train Protection system (ETCS Level-2) for implementation for 60,000 RKMs (or route kilometres) on Broad Gauge network (Govt. of India, 2018e), while 345 RKMs (Route Kilo Meters) on Indian Railways has European Technology ETCS Level 1-based Train Protection and Warning System (Govt. of India, 2019ab).

The EU has been looking for a long-term engagement with India in the field of railways focusing on "digitization, green transport, EU-Asia rail links and shared innovations." India, meanwhile, has expressed interest in partnering with Europe for investments that can take forward the 'Make In India' initiative for manufacturing as well as in developing new technologies

"without tied conditions". India also wants European investments in railways that can lead to employment opportunities for Indians. Indian Railways, facing capacity constraints, has also held talks with the EU divisions on mobility and transport as well as standardization. The issues of bilateral discussions included "railway reforms and regulations, railway safety and technology (signalling, including ERTMS), procurement and standardization as well as digitization and innovation" (Govt. of India, 2019ac).

India was one of the targeted countries for the EU's *Promoting European Rail Excellence outSide EU* or *PERES* Partnership to develop rail value chains, promote small and medium enterprises as well as a 'joint internationalisation strategy and implementation roadmap towards USA and India' (Eurail Clusters website). Also, big European companies in the Indian railways sector include Bombardier Transportation (which supplies rolling stock to Delhi Metro and has whose "propulsion equipped locomotives travel around 300,000 kms on Indian Railways network") (Bombardier Transportation website); Alstom (supplying rolling stock, "executing signalling and power supply systems for the 343 Km. section on World Bank funded Eastern Dedicated Freight Corridor" as well as investing in research and development) (Alstom website); and Siemens (railway signalling and propulsion system) (IBEF web link on Siemens; RailNews, 2019).

Stadler was also eyeing a mega project to supply electric coaches to India, but the contract, which was already on hold due to the proposed merger between Alstom and Siemens (not cleared by the European Commission), is now being reviewed by India (Swissinfo, 2019). Other European companies keen on participating in India's rail modernisation plans include Deutsche Bahn AG, First, Renfe, SNCF and Talgo (Nandan Sharma, 2019). Switzerland, which houses companies such as Stadler, is keen on areas such as "railway freight and passenger cars, electrification equipments, multimodal transport and tunnelling technology" in India (Govt. of India, 2019ad), while companies from the Czech Republic are interested in developing and supplying technologies for signalling systems, carriages and locomotives as part of building Delhi-Kolkata, Delhi-Mumbai and Pune and Dehi-Hyderabad rail corridors (Roche, 2013). In the area of development of railway stations, India is in cooperation with French Railways (SNCF) and the French agency Agence Française de Développement or AfD (Govt. of India, 2019ae).

Energy

The *energy dialogue* between India and the EU has been going on since 2005 and the bilateral energy panel holds a meeting every year (EU, 2016a). Both the sides also have a partnership on clean energy and climate to promote among other things "access to and dissemination of clean energy and climate friendly technologies" and to "encourage research and the development of innovative solutions". The partnership also covers areas including renewable energy, transport as well as cooperation between cities in India and Europe. The EU is also lending support to Indian cities to be a part of the 'Global Covenant of Mayors on climate and clean energy' (EU, 2019n).

A major project in the energy sector is the world's largest nuclear power project in Jaitapur (Maharashtra) (total capacity of 9.6 GW) with the help of France. Along with renewable energy sources, the project, once operational, would help India achieve its goal of 40 per cent non-fossil energy by 2030 (Govt. of India, 2018f).

To ensure continued focus on environment-friendly and sustainable measures in all areas including in connectivity-related segments such as mobility, construction and energy, the EU has a policy engagement with India on *Resource Efficiency Initiative* (to develop a national strategy on Resource Efficiency and help India become a circular economy by 'mainstreaming a life-cycle approach to product development and disposal' as well as promoting sustainable public procurement, and sustainable production and consumption, among others) (EU, 2018h; EU, 2017b). Then there is also the EU-India *Clean Energy Cooperation* (to focus on development of renewable energy as well as energy efficient buildings and construction) (EU, 2016a).

Urban Development

The *Smart City Mission*, where the total cost of projects so far is around Rs 2050180 million (or USD 30.8 billion) and impacting the lives of over 99.6 million people in India[15], has attracted a lot of interest from several European nations. These include *Spain* (to develop *Delhi* – Govt of India, 2015e), *Germany* (aiming to develop *Bhubaneswar in Odisha, Kochi in Kerala and Coimbatore in Tamil Nadu* – Govt of India, 2017f) and *France* (*Nagpur in Maharashtra, Chandigarh and Puducherry* – Govt. of India, 2018g).

The EU, through the Agence Française de Développement (AfD), is supporting the *Mobilise Your City (MYC)* programme in India currently in three pilot cities - *Ahmadabad, Kochi and Nagpur* - to bring down their urban transport-related Green House Gas (GHG) emissions and contribute

to a sustainable transport policy at the national level (Govt. of India, 2018h). The *Nordic countries (Denmark, Finland, Iceland, Norway and Sweden)* are supporting India's Smart City Mission through their Nordic Sustainable Cities Project (Govt. of India, 2018i). *The UK*[16] (aiming to develop *Amravati, Indore and Pune* - Govt. of India, 2016f; Govt. of India, 2018j) and *the Netherlands* (Govt. of India, 2018k) are also working on addressing mobility-related issues and building smart cities in India.

Urban development in India is a sector that has evinced significant interest from the EU and European nations. This has led to the signing of MoUs and agreements as well as establishment of joint working groups. The European countries and their areas of interest include: (i) Netherlands (*technical cooperation in water management, spatial planning and mobility management, affordable housing and smart cities*), (ii) Denmark (*city to city cooperation, cooperation on urban water management, sustainable smart cities, setting up of urban living labs for capacity building solutions to smart cities*), (iii) France (*management of waste and water, urban mobility, smart cities, affordable housing*), (iv) Germany (*sustainable urban development*), (v) UK (*technical cooperation in sustainable urban development*), and (vi) Sweden (*training and capacity building, waste management, waste to energy production, smart cities planning and development, urban mobility and sustainable transportation*) (Govt. of India, 2019af).

At the EU level, the focus is on *'smart and sustainable urbanization',* which has an Action Plan that includes five action points: *"(a) supporting Smart and Sustainable Cities; (b) promoting investments in sustainable urbanization; (c) promoting climate action and disaster risk reduction in cities; (d) Developing effective solid waste management and treatment and promotion of circular economy; (e) Developing effective water supply and sewage system; (f) innovation in housing."* The European Investment Bank, which has already financed metro projects in India, is looking at enhancing its support to urban transport in the country.

As regards the 12 smart cities (Agartala, Amritsar, Amaravati, Bhubaneshwar, Chennai, Hubbali/Hubli and Dharwad, Dehruadun, Kochi, Pondicherry, Surat, Ujjain, Vishakhapatnam) (AfD, 2019) that the EU is supporting under the EU-AFD Smart City project with a focus on areas including urban e-governance and sustainable mobility, the plan now is to boost this sustainable urban development initiative through 'city-to-city pairing and cooperation between 12 Indian and European cities'. The focus areas for cooperation include technology (Artificial Intelligence, block

chain, Internet of Things, sensor technologies and standards for enhanced data management); water (drinking water, groundwater use, wastewater treatment and treated water reuse); waste (e-waste recycling, plastic waste management, waste to energy green buildings); energy (energy efficiency, smart lighting, renewable energy grid integration district energy system, smart grids, solar PV for rooftops, distributed energy, access to modern energy and waste to energy, green cooling and alternative fuels including biofuels), mobility (mobility infrastructure, e-mobility and green civil aviation) and construction (sustainable construction and demolition). Another area that is of importance to the EU is getting Indian cities to join the Global Covenant of Mayors for Climate and Energy – a coalition of cities and local bodies to combat climate change through measures to help reduce green house gas emissions and adopt low-carbon and climate resilient models. There are 15 Indian cities that have joined the initiative (EU, 2019o).

People-to-People

In the area of people-to-people connectivity, India's vast pool of high-skilled workers and talented professionals could be the answer to Europe's problem regarding the fall in working-age population as well as a shortage of skilled workers - especially in the field of Information and Communication Technology (ICT) where there is a high demand for people with the requisite talent and skills. The EU-India Cooperation and Dialogue on Migration and Mobility project aims to improve the migration and mobility governance. The International Labour Organisation (ILO) is now providing technical support in this regard (ILO, 2018a). There are now efforts to spread awareness about the concept of 'fair and ethical recruitment' as well as the related standards and global best practices to ensure that the workers going to Europe from India are recruited in such a manner (ILO, 2018b).

A decade after initialising the EU-India High-Level Dialogue on Migration and Mobility, both the sides inked the Common Agenda on Migration and Mobility (CAMM) in 2016. Its four pillars include: *(i) better organization of regular migration including skilled migration as well as improving well-managed mobility through issuance of more visas; (ii) ensure maximum development impact of mobility and migration by addressing issues including those related to social security; (iii) prevent illegal migration and human trafficking; and (iv) boost international protection.* Governance of migration and protection of the welfare of Indian migrants is done through laws including the Passports Act, 1967, the Emigration

Act, 1983 (including its amendments), as well as the Foreigners Act, 1946. The government also organises pre-departure training and orientation for migrants, besides schemes such as Pravasi Kaushal Vikas Yojana (skill development programmes for young people aimed for jobs overseas) and Pravasi Bhartiya Bima Yojana (for mandatory insurance) as well as a web portal for various emigration-related services.

As regards the EU, the legal basis of its common immigration policy as well as measures on legal migration and prevention of illegal migration arises from provisions of Article 79 (1 and 2) of the Treaty on the Functioning of the European Union (TFEU). The EU has a Global Approach to Migration and Mobility (GAMM), which is implemented with partner countries through various Mobility Partnerships (MPs) and Common Agenda on Migration and Mobility (CAMM). Data during the 1990-2017 period shows that Indian immigrants accounted for around 7.9 per cent of the EU's total population, with the popular destinations being the UK, France, Netherlands, Italy and Germany.

In 2017, out of the total the 31.2 million overseas Indians (including Non-Resident Indians and Persons of Indian Origin), around 2.83 million were in the EU/Europe (of which 64.5 per cent were in the UK, 8.31 per cent in the Netherlands, 6.98 per cent in Italy, 6 per cent in Germany and 3.85 per cent in France). Another trend was an increase in issuance of short-term visas (up to 90 days) as well as 'blue card' (to live and work in the EU), and a decrease in long-term visas (at least for five years) to Indians entering the EU. There was a decline in the overall number of Indians found to have been illegally present in the EU, though within this the number of females had gone up. The top five European countries that asked Indians to leave were the UK, France, Netherlands, Belgium and Germany. Of the USD 62.7 billion received as remittances in India in 2016, the share of EU-28 was 5.29 billion USD (or 8.43 per cent). Of this, 66 per cent was from the UK, followed by Italy (10.2 per cent), Germany (5.5 per cent), France (4.2 per cent), Spain (3 per cent), Netherlands and Sweden (1.9 per cent each), Ireland (1.7 per cent) and Belgium (1.3 per cent) (ILO, 2019).

India is keen on greater ease of mobility of professionals, mutual recognition of academic qualifications and skills, as well as investment-linked mobility. More than language and culture, the main barriers currently are inadequate financial assistance and number of scholarships to students as well as insufficient network of educational institutions (ILO, 2017).

Finance

In the area of financial connectivity, India and Netherlands have in place a two-way '*financial corridor*' which helps in identification of opportunities 'in as well as for' the financial sector. It also helps mobilise private and public capital, including sovereign wealth funds and pension funds, into infrastructure sectors. The corridor was aimed at boosting the position of Netherlands as a 'financial hub' for Indian firms (IDCBS website). A similar set up for an India-EU financial corridor can be looked at for improved financial connectivity.

India-EU financial sector ties are far below potential as seen in *Table 4 to Table 8*.

Table 4: European banks in India: Branch/Wholly Owned Subsidiary form of Presence[17]

Name of bank	Country of Incorporation	No of banking branches
Standard Chartered Bank	UK	100
Deutsche Bank	Germany	17
BNP Paribas	France	8
Barclays Bank Plc	UK	6
Credit Agricole Corporate & Investment Bank	France	5
Societe Generale	France	4
Cooperatieve Rabobank U.A	Netherlands	1
Credit Suisse A.G	Switzerland	1
NatWest Markets Plc	UK	1

Source: Reserve Bank of India, 2019a - as on 30 September, 2019.

Table 5: European banks in India: Representative Office form of Presence

Name of the representative office	Country of incorporation	Centre
Intesa Sanpaolo S.p.A	Italy	Mumbai
Banco BPM S.p.A	Italy	Mumbai
Monte Dei Paschi Di Sienna	Italy	Mumbai

Table 5 continued...

Table 5 continued...

UBI Banca – Unione di Banche Italiane	Italy	Mumbai
Uni Credit S.p.A	Italy	Mumbai
Commerzbank	Germany	Mumbai
DZ Bank AG	Germany	Mumbai
KfW IPEX Bank GmbH	Germany	Mumbai
Landesbank Baden – Wurttemberg	Germany	Mumbai
Banco Bilbao Vizcaya Argentaria	Spain	Mumbai
Banco de Sabadell SA	Spain	New Delhi
CaixaBank S.A.	Spain	New Delhi
Credit Industriel et Commercial	France	New Delhi
Natixis	France	Mumbai
Skandinaviska Enskilda Banken AB	Sweden	New Delhi
Svenska Handlesbanken	Sweden	Mumbai
UBS AG	Switzerland	Mumbai
Zurcher Kantonalbank	Switzerland	Mumbai
Raiffeisen Bank International AG	Austria	Mumbai
K.B.C. Bank N.V.	Belgium	Mumbai
DNB Bank ASA	Norway	Mumbai
Caixa Geral de Depositos	Portugal	Mumbai

Source: Reserve Bank of India, 2019a - as on 30 September, 2019.

Table 6: Country-wise branches of Indian Banks in Europe[18]

Country	**Bank name**	**Number**
France	Bank of India	1
Germany	State Bank of India	1
UK	Bank of Baroda	1
UK	Bank of India	5
UK	Canara Bank	1
UK	SBI	1
UK	Syndicate Bank	1

Source: Reserve Bank of India, 2019b - as on 30 September, 2019.

Table 7: List of subsidiaries of Indian Banks in Europe[19]

Country	Name of Bank	Remarks
UK	Bank of Baroda (UK) Ltd	100% by Bank of Baroda
UK (London)	Bank of Baroda (UK) Nominee Ltd.	100% by Bank of Baroda
UK (London)	Punjab National Bank International Ltd.	100% by Punjab National Bank
UK	State Bank of India (UK) Ltd	100% by State Bank of India
UK (London)	Union Bank of India (UK) Ltd	100% by Union Bank of India
UK (London)	Axis Bank UK Limited	100% by Axis Bank
UK (London)	ICICI Bank UK Ltd	100% by ICICI Bank

Source: Reserve Bank of India, 2019b - as on 30 September, 2019.

Table 8: List of Representative Offices/other Banking Offices of Indian Banks in Europe

Name of the bank	Centre
Bank of Baroda*	UK (London)
IndusInd Bank Ltd.	UK (London)
State Bank of India	Paris, France
State Bank of India (extension counter)	UK (London)

* Representative office of Dena Bank operates as Representative office of Bank of Baroda with effect from 1 April, 2019 as Dena Bank got merged with Bank of Baroda.

Source: Reserve Bank of India, 2019b - as on 30 September, 2019.

India has made efforts to attract EU-based sovereign wealth funds and pension funds into the infrastructure sector as seen in the instance where the Indian Prime Minister Narendra Modi himself had in 2017 "encouraged the Dutch Pension Funds to participate in India's National Infrastructure Investment Fund" (Govt. of India, 2017g). In general, India is seen by sovereign wealth funds and pension funds as an attractive destination for investments in connectivity-related sectors such as renewable energy (wind, solar and hydro projects) and airports (Arnold, 2019).

There have also been reports of parleys between Indian entities (such as Neev Capital) and European pension funds and private equity companies from the Netherlands, Germany, Scandinavia and the UK for investments in India's infrastructure sector (Sourbes, 2011). At a time when Indian infrastructure companies were struggling to repay their debt due to policy paralysis and red tape as well as owing to economic slowdown, APG Asset Management, a Dutch pension fund, had decided to partner with India-based Piramal Enterprises to invest in India's infrastructure sector (Reuters, 2014). India's oil and gas sector and infrastructure finance sector were also seen as ones with potential by European pension funds such as the one from Norway, called the Government Pension Fund Global (Sharma. R, 2019). These instances show that there is enough scope to develop a larger EU-wide framework for enhancing financial sector connectivity to channel investments into connectivity-related sectors.

Indian Investments in the EU

Regarding India's investments in the EU, an EU-wide screening of FDI into the EU shows that the number of EU companies controlled by investors from India had risen significantly from 2,000 in the year 2007 to 12,000 in 2017.[20] The sectors where Indian investors had the highest concentration of greenfield investments by number during the 2013-2017 period in the EU included 'computer programming', 'scientific research and development', financial services, wholesale trade, motor vehicles manufacturing and 'manufacturing of basic pharmaceuticals'. In terms of value of greenfield investments, the sectors of interest in the EU to Indian investors during 2013-2017 were motor vehicles manufacturing , rubber and plastic manufacturing 'scientific research and development', financial services, basic pharmaceuticals manufacturing and computer programming (EU, 2019p). This shows that India is yet to make a mark in major connectivity-related segments in the EU.

Indian companies make investments in the EU with an aim to expand their operations and move up the value chain by hiring skilled workers as well as by acquiring reputed brands and the latest technologies. The Euro zone crisis, which adversely impacted valuations of European companies, had also encouraged Indian investors to go in for acquisitions of troubled companies and ensuring a turn-around (Charlie, 2012).

With India keen on gaining expertise in strengthening its research and development, the EU's 80 billion Euro research and innovation programme

(the EU's largest ever such programme) called *Horizon 2020* should have been a priority area for cooperation. However, Indian participants are not 'automatically eligible' for funding under Horizon 2020 like those from other emerging BRIC economies (Brazil, Russia and China). Indian participants will have to generally manage with their "own funds, funds from Indian ministries, foundations and other organisations, that fund international research and innovation activities." However, in cases where participating in Horizon 2020 is crucial for implementation of the project, there is a co-funding mechanism backed by the European Commission as well as the Indian the Ministry of Earth Sciences, Department of Science and Technology and the Department of Biotechnology. The areas related to connectivity identified for this co-funding mechanism with scope for India-EU cooperation include 'secure, clean, affordable and efficient energy' projects (that boost the use of renewable energy and improve energy efficiency), projects to combat climate change including innovations that can make local energy networks 'smart and integrated' (EU's Horizon 2020 initiative's web link to India country page; EU, 2019q). The two sides could look into expanding the scope of such funding to other areas of connectivity.

5.2 Possible tie-ups for Global Initiatives

India, Iran and Russia had together initiated the *International North South Corridor (INSTC)* to boost transportation cooperation and connectivity with central Asian nations. The INSTC is billed as the "shortest multimodal transportation route" connecting the Indian Ocean and Persian Gulf through Iran to Russia and North Europe. The INSTC, with an estimated annual capacity of around 20-30 million tonnes of goods, is expected to bring down cost and time by about 30-40 per cent (Govt. of India, 2018l). Though the project was launched in the year 2000, it saw slow progress or was virtually at a standstill for several years (Singh and Sharma, 2017).

The challenges faced by the INSTC initiative include those related to security threats in conflict zones of the region, lack of political will, problems regarding economic feasibility as well as sub-optimal level of container trade and return cargo (Govt. of India, 2015a).

Given the possibilities to link INSTC to the North of Europe (*See Figure 5*), there have been reports of increasing European interest in the project – *(i) the case of German railway firm Deutsche Bahn expressing keenness on using it to boost Germany's trade with Iran (Chaudhury, 2016); (ii) the French development agency Agence Française de Développement*

(AFD) entering into co-financing arrangement with the Asian Development Bank for the project (Aliyeva, 2018); (iii) and discussions on European countries such as Estonia, Finland and Latvia being a part of the INSTC (EghtesadOnline, 2017), to name a few. Taking note these developments, a paper by Sarma and Menezes had argued that economic viability of the INSTC can be enhanced by making the corridor "truly transcontinental" through initiatives that includes integrating it to the EU's Trans-European Network-Transport (TEN-T) Core Network - especially "the North Sea-Baltic TEN-T Core Network Corridor, the Scandinavian-Mediterranean TEN-T Core Network Corridor and the Baltic-Adriatic TEN-T Core Network Corridor." In this regard, it was observed that Latvia was making efforts to 'synchronise' its railways to INSTC. Also, it was suggested that efforts should be made by INSTC members including India to establish links between INSTC initiative and the plans for an Arctic Corridor to shorten Asia-Europe goods transportation link and boost Asia-Europe trade. Among the funding sources that could be considered for this initiative include the EU facilities and funds for transport infrastructure projects such as the Connecting Europe Facility (CEF) Transport (which has two the five European Structural and Investment Funds as well as a Cohesion Fund), the European Fund for Strategic Investments (EFSI) and the European Regional Development Fund (ERDF) (Sarma and Menezes, 2018).

Another potential area of for India-EU cooperation in international connectivity is the *Asia-Africa Growth Corridor (AAGC)*, jointly initiated by India and Japan to boost ties between Asia and Africa through improved infrastructure. There is ample scope for India and Japan to cooperate with the EU for the AAGC (Panda, 2018; Okano-Heijmans and Panda, 2018), given the EU-Japan Partnership on Sustainable Connectivity and Quality Infrastructure (EU, 2019d), the convergence of views on connectivity between India and the EU (EU, 2017a), the need for greater resources for completion of AAGC as well as the concerns of India and the EU member nations over China's mega connectivity project called the Belt and Road Initiative (Govt. of India, 2017b; Heide et al, 2018; Panda, 2018). What can also help are the commonalities of approaches of India, Japan and the EU regarding using connectivity to achieve the UN Sustainable Development Goals, a global order based on democracy, rule-of-law as well as principles of fairness and openness (as seen in the AAGC vision document and the EU's proposed building blocks for a Euro-Asian connectivity strategy) (Panda, 2018; RIS, ERIA and IDE-JETRO, 2017; EC, 2018d). There is also scope

for cooperation with the EU in the Indian Ocean region given the 'Free and Open Indo-Pacific' (FOIP) strategy adopted by the Quad comprising India, Japan, the U.S., and Australia. Having observed China's growing influence in the Indo-Pacific, an inclusive and pluralistic approach of India for the region is also aimed at achieving a strategic counter-balance (Okano-Heijmans and Panda, 2018).

Figure 5: INSTC - Proposed Routes

Origin	Destination	
Indian subcontinent	North of Europe	Mumbai – Bandar Abbas – Amirabad or Anzali port – Lagan or Astrakhan port – Moscow – Helsinki – Berlin - Vienna
Indian subcontinent	North of Europe	Karachi – Mirjaveh – Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
Persian Gulf area	North of Europe	Dubai – Bandarabbas - Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
Persian Gulf area	North of Europe	Riyadh - Bandar-e Imam Khomeyni - Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
Persian Gulf area	North of Europe	Kuwait - Bandar-e Imam Khomeyni - Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
Persian Gulf area	North of Europe	Baghdad – Tehran - Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
CIS	North of Europe	Ashgabat – Sarakhs – Tehran - Amirabad or Anzali port – Lagan or Astrakhan port - Moscow – Helsinki – Berlin - Vienna
CIS	Indian subcontinent	Ashgabat – Sarakhs – Bandarabbas – Jebel Ali port – Mumbai – New Delhi
CIS	Indian subcontinent	Ashgabat – Sarakhs – Bandarabbas – Jebel Ali port – Karachi - Lahore
CIS	Indian subcontinent	Ashgabat – Sarakhs – Bandarabbas – Jebel Ali port – Colombo - Dhaka

Source: Govt. of India, 2015a.

Other regions where there is scope for India-EU cooperation in physical, digital and people-to-people connectivity is *Central Asia*, which is an extended neighbourhood for India and EU and where both enjoy goodwill (Sachdeva and de Vergeron, 2019). Such a strategy could also provide a balance in the power play in the region where China and Russia are strengthening their influence including through a project to link China's Belt and Road Initiative with the Russia-led Eurasian Economic Union (TASS, 2019; Sachdeva and de Vergeron, 2019). Also, given the cooperation seen in the cases of Indo-Dutch Sustainability (INDUS) Forum and the International Solar Alliance, there is also scope for extending such cooperation between India and the EU including its member states to connectivity initiatives

such as the *Bangladesh, Bhutan, India, and Nepal (BBIN)*, especially in areas such as waterways connectivity (Okano-Heijmans and Sundar, 2018).

Another area of India-EU cooperation could be on the proposed *Trans-Asian Railway (TAR)* project of UNESCAP to strengthen connectivity within Asia and with plans to link it to Europe. The initiative, among other things, aimed to develop railway links between South Asia and Europe for transport of containers. This was to be carried out by strengthening and modernising existing rail and ferry links as well as by building new railway lines in areas that were identified as missing links. India was keen to operationalise the TAR Southern Corridor route and improve connectivity with Nepal and Bangladesh. There were also proposals for boosting links between India and Myanmar as well as with Cambodia, Malaysia and Vietnam in the context of TAR. In 2007, as part of India's 'Look East Policy', India had inked the Inter-Governmental Agreement on TAR. Several initiatives were taken to link India's north-eastern region with Bangladesh and South East Asian nations. India being a signatory to the TIR Convention can also help in taking forward the TAR initiative (UN, 1999; Govt. of India, 2007; Sarma, 2019; Chin, 2018; Sood and Bhaskar, 2017; Ankala, 2020).

6.Regulatory Issues

The EU has entered into several bilateral and multilateral treaties on a host of activities. Among these, the connectivity related ones include 50 agreements on energy, 68 on environment, 250 on external relations (including on issues such as borders, visa, movement of persons, and partnership and development), 59 on research and innovation, 86 on transport, six each on information society and on education, training and youth, and one on audiovisual and media. With India, the EU has 11 bilateral agreements, of which the connectivity related ones were on air services, fusion energy research, renewable energy and scientific cooperation.[21] India has several agreements with individual countries in Europe on various physical, digital and people-to-people connectivity-related issues (*See Table 9*). It is important to carry out a detailed analysis of these bilateral agreements to build on their synergies. Such an exercise, when done during the process of firming up a comprehensive connectivity partnership agreement at the EU level, can ensure a smooth implementation of such an overarching India-EU pact with the collective support of the EU member states.

Table 9: India's Agreements with European Countries on Connectivity-related Issues[22]

Sector/Issue	Countries	Number of Agreements
Air services/civil aviation/carriage of in-flight security officers	Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Greece, Germany, Hungary, Iceland, Italy, Latvia, Netherlands, Norway, Poland, Serbia, Slovakia (and erstwhile Czechoslovakia), Spain, Sweden, Switzerland, UK	24
Railways – on technical cooperation, safety, semi-high speed rail and station renovation	Austria, Belgium, Czech Republic, France, Germany, Italy, Switzerland, Spain,	8
Roads and road transport	Austria, Spain	2
Shipping/merchant shipping	Bulgaria, Cyprus, Croatia, Poland	4
Ocean dialogue	Norway	1
Maritime cooperation/ transport/shipping/ technology/research	Belgium, Czech Republic, Denmark, Germany, Malta, Sweden	6
Prevention of marine litter	Germany	1
Water management	Netherlands	1
Energy, Nuclear energy	UK	1
Renewable energy	France, Spain	2
Solar energy	Germany	1
Digitalization	Finland, Germany	2
Cyber security	Finland, Spain, UK	3
Green urban mobility/ smart cities	Germany	1
Mobility management	Netherlands	1
Climate change and environment	Switzerland, Sweden	2

Table 9 continued...

Table 9 continued...

Sustainable and smart urban development	Denmark, Germany, Sweden, UK	4
River Ganga rejuvenation	Scotland, UK	2
Tourism	Bulgaria, Finland, Romania, Spain	4
Cultural exchange/ cultural cooperation	Austria, Cyprus, France, Greece, Iceland, Ireland, Lithuania, UK	8
Skill development and vocational training	France, Germany, UK	3
Education/higher education	France, Germany	2
Nalanda University	Portugal	1
Promotion of each other's languages (Modern Indian languages in the partner nation and the partner nation's languages in India)	Germany	1
Audio/video, film co-production	Italy, UK,	2
Exemption from visa requirement for holders of official and diplomatic passports	Bulgaria, Czech Republic, Finland, Iceland, Latvia, Poland, Portugal, Spain, Sweden, Switzerland	10
Migration and mobility	France	1
Social security	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Luxembourg, Norway, Netherlands, Portugal, Sweden, Switzerland	14
Labour Mobility Partnership	Denmark	1
Science and technology/ research and development/innovation	Austria, Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Poland, Slovakia, Switzerland, Sweden	13
Artificial Intelligence	Germany	1

Table 9 continued...

Table 9 continued...

Disaster management	Germany	1
Standardisation and certification	Germany	1
Start-ups	Germany	1
Fast track mechanism for investment of Indian companies	UK	1
Cooperation in third countries	UK	1
Joint projects, strategic projects	Czech Republic, Germany	3
Peaceful use of outer space/space exploration (for initiatives including Digital India)	Finland, France, Hungary, Netherlands, UK	5
Total number of agreements		**140**

Source: Author's compilation from websites of various Ministries of Govt. of India.

6.1 India

In almost all connectivity-related sectors, 100 per cent Foreign Direct Investment (FDI) through the automatic route (without the need for government approval) is permitted in India. These include a host of sectors such as railway infrastructure, ports and shipping, roads and highways, airports, air transport services (non-scheduled and other services in civil aviation), other services under civil aviation sector (maintenance and repair, flying training and technical training institutes), renewable energy, thermal power, tourism and hospitality, construction development (townships, housing and built-up infrastructure, hospitals), industrial parks (new and existing), B2B e-commerce activities, IT and Business Process Management, electronic systems, auto-components, automobiles, manufacturing, Asset Reconstruction Companies, petroleum and natural gas (exploration, infrastructure-related marketing, LNG regasification infrastructure etc.), broadcasting carriage services, mining and coal and lignite. Though 100 per cent FDI is permitted in satellites, telecom services and air transport services, there are some riders. These include the requirement of government approval in satellites for all FDI proposals, while government approval is needed for FDI beyond 49 per cent in telecom and air transport services.

Various security conditionalities are applicable in several sectors and these can be brought before the Cabinet Committee on Security on a case to case basis by the respective administrative department or ministry (Govt. of India, 2017h; website of Invest India) and FDI upto 49 per cent through the automatic route is allowed in power exchanges, infrastructure company in the securities market, petroleum refining by PSUs. The connectivity-related sectors where FDI is prohibited include railway operations (other than permitted activities mentioned under the Consolidated FDI policy) and real estate business. FDI proposals envisaging an investment of over 50 billion rupees or around USD 775 million are screened by the Cabinet Committee on Economic Affairs. Besides, there are certain conditions such as norms for minimum capitalization and lock-in period for investments made by non-residents in the capital of a resident entity in some sectors or activities (website of Invest India).

The EU's Concerns

It is important to note that the EU has included India among the countries that have raised the maximum number of trade and investment barriers. India with 25 such barriers was the third on that list for the year 2018 following China (37 barriers adversely affecting trade and investment from EU) and Russia (34). Regarding India, some of the main "barriers" in connectivity-related sectors include: *(i) "local content requirements in government procurement and the absence of a protection framework for foreign investments", (ii) "longstanding high duties and taxes in the automotive sector", (iii) "introduction of over 1000 new country-specific standards, an increasing number of which do not correspond to internationally-agreed standards", (iv) "increasing customs duties on ICT products (since 2014) and in October 2018, further expanding the list of products (including base stations, mobile phones, as well as their components and accessories) and increasing their applied duties", (v) "mandatory testing and licensing, as well as compulsory registration and labelling requirements" in the ICT sector.* As per the EU, these measures "prevent European manufacturers from competing with local manufacturers on an equal footing, affecting trade flows". According to the EU, even though the Indian government, through the *Make In India* initiative, wants to transform India into a manufacturing hub by attracting investment including from overseas, the initiative "does not prioritise trade openness". The EU has said that it was making attempts to resolve these issues and has noted that India "partially resolved" an issue relating to telecommunications equipment by "substantially relaxing the norms for exported goods which

need to be imported back for repair" (EU, 2019r). India, on its part, is yet to carry out such a regular comprehensive exercise on the trade and investment barriers faced by its commercial entities in the EU and across the world.

6.2: The EU

The EU regulation on the CEF encourages Public Private Partnership approaches in the TEN-T initiative. Besides, it specifies that the lead role in the roll out and modernisation of broadband networks and in the development of trans-European digital services should be played by the private sector. In fact, it specifies that "*public investment through financial instruments in fast and ultra-fast broadband networks must not lead to market distortions or create disincentives to invest. It should be used to attract private investment, and should be resorted to only in cases where there is a lack of commercial interest to invest*." Further it says that "*the CEF should provide for financial instruments to promote substantial participation in infrastructure investment by private-sector investors and financial institutions. To be sufficiently attractive to the private sector, financial instruments should be designed and implemented with due regard to simplification and reduction of the administrative burden but should also be able to respond to identified financing needs in a flexible manner*" (EU, 2013b).

Third country participation:

Participation of a third country (*any neighbouring country or any other country with which the Union may cooperate to achieve the objectives pursued by the EU Regulations*) in infrastructure and connectivity programmes is envisaged and encouraged by the EU regulations.

The CEF regulation of 2013 states that "*where necessary in order to achieve the objectives of a given project of common interest and where their participation is duly justified, third countries and entities established in third countries may participate in actions contributing to projects of common interest*." It further states that "*when third countries and entities established in third countries participate in actions contributing to projects of common interest, grants should be available only if the action is unlikely to be adequately supported by other forms of financial assistance under the CEF or under other Union programmes.*" The regulation also specifies that "*actions in third countries may be supported by means of the financial instruments if those actions are necessary for the implementation of a project of common interest*."

However, there is a condition for an EU agreement with the third country for EU financial assistance for such projects. The 2013 regulation states that "*transport-related actions involving a cross-border section or a part of such a section shall be eligible to receive Union financial assistance only if there is a written agreement between the Member States concerned or between the Member States and third countries concerned relating to the completion of the cross-border section*" (EU, 2013b).

Similarly, the regulation governing the TEN-T also talks about cooperation with third countries. It states that "*cooperation with neighbouring and third countries is necessary in order to ensure connection and interoperability between the respective infrastructure networks. Therefore, the Union should where appropriate promote projects of common interest with those countries*." The regulation also envisages cooperation with third countries to "*ensure the connection between the core network and the transport networks of the third countries, with a view to enhancing economic growth and competitiveness*" as well as to "*complete the transport infrastructure in third countries which serve as links between parts of the core network in the Union"*. It talks about promoting "*maritime transport and motorways of the sea, excluding financial support to third-country ports*" and facilitating *inland waterway transport with third countries*. Besides, the regulation also favours promotion of "*other projects, without providing financial support, in so far as such projects seek to: (a) promote the interoperability between the trans-European transport network and networks of third countries; (b) promote the extension of the trans-European transport network policy into third countries; (c) facilitate air transport with third countries, in order to promote efficient and sustainable economic growth and competitiveness, including the extension of the Single European Sky and improved air traffic management cooperation; and (d) facilitate maritime transport and promote motorways of the sea with third countries*" (EU, 2013c).

However, under *Article 346 of the Treaty on the Functioning of the EU*, the EU Member States can take any measures, including preventing foreign investments, to protect security interests (EU, 2016b).

The EU has been maintaining that it is "one of the world's most open investment regimes, as acknowledged by the OECD in its investment restrictiveness index". However, from 10 April, 2019, the EU has been implementing its new framework for screening of FDI, including from State-owned Enterprises, to block such investments that threaten security and

public order in one or more EU Member States or 'undermine a project or programme of interest to the whole EU, such as Horizon 2020 or Galileo' (EU, 2019s). The EU-wide screening of FDI, among other things, will be in sectors including "*critical infrastructure, whether physical or virtual, including energy, transport, water, health, communications, media, data processing or storage, aerospace, defence, electoral or financial infrastructure, and sensitive facilities, as well as land and real estate crucial for the use of such infrastructure*." The other sectors include "*artificial intelligence, robotics, semiconductors, cyber security, aerospace, defence, energy storage, quantum and nuclear technologies as well as nanotechnologies and biotechnologies*." The screening is also extended to supply of "*critical inputs, including energy or raw materials, as well as food security; access to sensitive information, including personal data, or the ability to control such information; or the freedom and pluralism of the media*" (EU, 2019t). It will be vital for India to ensure that the EU-wide screening, as part of ensuring security, does not become a barrier to genuine investments from India to the EU in connectivity-related sectors.

Research and Innovation

India has been a top partner country for the EU in its research and innovation programmes. The foundation for the partnership was laid by the 2001 European Community-India Science and Technology Cooperation Agreement (which was subsequently renewed in 2007 and 2016) as well as the 2009 pact for cooperation in fusion energy research. Besides, initiatives such as linking India's National Knowledge Network (NKN) to Europe's GÉANT (a pan-European network for research, innovation, education and scientific excellence – an e-infrastructure collaboration effort), part of the EU-supported Trans-Eurasia Information Network (TEIN), are also aimed at strengthening this cooperation. The EU's funding programme on research and innovation during the 2007-2013 period, known as 7th Framework Programme (FP7), saw India being the fourth leading partner in terms of participation (participants from India were partners in over 200 projects), and third in terms of receiving EU financial contribution (Indian entities got funding of around 41 million Euros). Indian students have also benefited from being recipients of the ERASMUS MUNDUS programme (around 2,500 Indians were chosen for Erasmus Mundus scholarships); while more than 1,600 Indian researchers were beneficiaries of the Marie Curie fellowships (to ensure 'mobility and training of researchers'). Now there are the new ERASMUS+ programme (for Master's students) and Marie Skłodowska-

Curie Actions (for PhD students) that Indian students can apply for (EU, 2016c).

However, the lack of 'automatic eligibility' for Indian participants for funding under Horizon 2020 - contrary to the FP7 programme where Indian entities could get funding automatically – could prove to be a limiting factor as far as India's participation in the Horizon 2020 programme is concerned (EU's Horizon 2020 initiative's web link to India country page; EU, 2019q; Labs Explorer, 2017). It was seen that the participation of non-EU countries in the Horizon 2020 has fallen as against the scenario in the FP7 programme (EU, 2018i). There are ongoing discussions aimed at ensuring greater participation of non-EU countries in research initiatives like the Horizon Europe (Kelly and Hudson, 2019). India should closely monitor such developments and push for participating in Horizon Europe as a non-EU member on terms that will guarantee a fair chance to Indian entities to take part in projects under the programme. In this regard, India could also consider being an associate member of the Horizon Europe programme by making a financial contribution to the programme's budget.

Civil Aviation

Another connectivity-specific regulatory issue where India and the EU are not on the same page is the one related to aviation emissions. The European Commission is keen on ensuring that the EU member states turn down the International Civil Aviation Organisation's (ICAO, a UN specialised agency) new scheme CORSIA (or the Carbon Offsetting and Reduction for International Aviation). This is with a view to expand the requirements of the aviation sector under the EU Emissions Trading Scheme (ETS), which would be more stringent than the CORSIA norms. The EU feels the CORSIA norms are not adequate to curb aviation emissions, and that its ETS would be more effective in that regard. The CORSIA norms are voluntary during the initial 2021-2027 period. India, though a signatory to the Paris Agreement on climate change mitigation, has not signed on to CORSIA. Countries including India and China had also objected to the EU move to bring in aviation sector into the ETS and applying it to all flights departing from or landing in the territory of the EU. However, the implementation of the ETS, which would include the aviation sector, is now delayed (Keating, 2019; Morgan, 2019; Transport and Environment, 2019). In civil aviation, many Indian airliners are keen to expand their operations including to Europe, and would therefore are eyeing more landing slots and code-sharing arrangements. The development also follows the suspension of the operations of Jet Airways (PTI, 2019; Bailey, 2019; Mufti, 2019).

Energy

A major concern in the field of energy is regarding the Energy Charter Treaty (ECT), which is an important multilateral instrument in the field of international energy governance. The ECT has more than 50 signatories/ contracting parties including the EU and its member nations (EU, 2014). The ECT had become controversial after several investors used it for suing or threatening to sue the ECT member countries for changing policies to reduce/ eliminate the fossil fuels use as part of climate change mitigation efforts. The investors, claiming losses due to such measures, have been able to win such cases where the total damages paid (or agreed to be paid) by the concerned governments so far run into a billions of USD (of tax payers' money). This development in effect is coming in the way of ECT members taking measures as part of the Paris Agreement on climate change mitigation. There are now efforts to reform the ECT, especially its provisions regarding settling disputes between investors and the governments of the ECT member countries, even as there is huge pressure on the EU and its member countries to withdraw from the ECT (Keating, 2019a and b; Nicolas, 2019). Even though India is not a signatory to the ECT, there is a need to look into the implications of the ECT provisions and the ECT cases on the India-EU initiatives on climate change and environment including the International Solar Alliance.

Digital

In the area of *digital connectivity,* the focus is now on privacy and data protection. In this regard, India's Personal Data Protection Bill is before its Parliament. It has several similarities and differences with the EU's General Data Protection Regulation. The similarities are on norms relating to their applicability beyond the respective territories, consent requirements and principles of data processing (including transparency, fairness and limitations on purpose, collection and storage, etc.). However, there are differences as well. These include on areas such as: *(i) data localisation (with the Indian Bill prescribing riders on data localisation and local storage norms, thereby opting for more stringent norms on data localisation; it also has provisions relating to localisation of 'sensitive personal data' including data relating to finance, health, biometric and caste); (ii) inclusion of a category called 'critical data' in the Indian Bill (not there in the EU regulation); (iii) inclusion of data protection audits in the Indian Bill (whereas the EU regulation only seeks conformity with best practices on security); (iv) data transfer overseas (where the EU regulation has clearer provisions); (v)*

protection from personal harm (the Indian Bill gives the right to oppose profiling only to children, while the EU regulation gives the right to oppose profiling to all data subjects when it is related to direct marketing); as well as (vi) higher penalties prescribed under the EU regulations than the Indian Bill for violations (Roshan, 2019; Mehrotra, 2019; Srivastava, 2019).

It is crucial to note that harmonisation of data protection regime would be an important requirement for businesses to ensure effective cooperation through data exchange. The issue of India not recognised as a 'data-secure' country by the EU has been a sticking point in the India-EU FTA negotiations (*See Box 4 for details*). The absence of a 'data-secure' tag for India hinders the flow of sensitive data to the country. This, in turn, pushes up the operating costs for Indian companies doing business in the EU. However, what can help is a balanced approach through strong India-EU institutional cooperation. Once India's Personal Data Protection Bill is enacted into a law, India and the EU could also consider a framework on data flows on the lines of the EU-US Privacy Shield. Such a framework could be brought into effect to ensure that the fundamental rights of Indians (and the Europeans) are protected in cases where their data is transferred to the EU (and the data of citizens of EU member states to India). This will provide the commercial entities 'legal certainty' to conduct their businesses (EU, 2016d).

BREXIT

With the UK no longer a part of the EU, it would be important for India and the EU to carry out various studies on the short-term, medium-term and long-term consequences of Brexit on the India-EU relations including the aspects related to connectivity. The implications of Brexit on the India-EU BTIA are briefly addressed in Box 4. Some of the connectivity-related sectors that could be impacted include automobiles and auto-components, information, communication and technology, telecommunications, financial services, travel and tourism and education (Edgington, 2020; Langfitt, 2020; Bhala, 2018; European Movement International, 2016; Deloitte Touche Tohmatsu India LLP, 2016; PricewaterhouseCoopers B.V, 2016; Moid, 2016; Acharyya and Mukherjee, 2017; PHDCCI, 2016; FICCI, 2016).

7. Conclusion and Way Forward

Improving physical, digital and people-to-people connectivity through greater investments and their efficient utilisation can lead to creation of value chains, employment generation and higher growth (World Bank,

2019). However, connectivity measures are also increasingly being used as geo-strategic, geo-political and geo-economic mechanisms by global powers such as China to advance their own agenda and interests (Okano-Heijmans and Panda, 2018).

Given this background, India and the EU - being democracies with time-honoured ties, and having agreed on the basic connectivity principles (*that connectivity initiatives must be based on universally recognised international norms, good governance, rule-of-law, openness, transparency and equality; and must follow principles of financial responsibility, accountable-debt financing practices, balanced ecological and environmental protection, preservation standards and social sustainability*) - could now consider taking forward their shared approach to connectivity through a connectivity partnership for their mutual benefit as well as to assist developmental efforts across the world in a sustainable manner. The connectivity partnership must, however, be also based on '*access, equity and inclusion*' principles as well as without any legal implications (of binding rights or obligations under local and international laws).

What can help in this regard is the foundation of various connectivity-related initiatives between India and the EU (including facilitating legal migration, promoting research and innovation as well as cooperating on areas such as renewable energy, urban development, digital technologies and aviation, to name a few).

However, the existing challenges include India lagging behind most European countries on various connectivity parameters as well as the sub-optimal level of investments and technology transfer from the capital-rich and technologically-advanced Europe into connectivity-related sectors in India. Also, financial connectivity in terms of European banks in India and Indian banks in Europe is below potential.

In addition, participation of Indian commercial entities in the EU's flagship initiatives such as Trans-European Network for Transport (TEN-T), Trans-European Networks for Energy (TEN-E), Digital Single Market (DSM) Strategy, Horizon 2020 Transport and Horizon 2020 Energy is also not significant.

However, given India's 'infrastructure deficit' (Dangra, 2016) and poor connectivity with its South Asian neighbouring countries (Kathuria, Ed., 2018), the current priority for India should be to improve connectivity facilities within the country and in the neighbouring region. The EU could

help in this regard with its technological might and financial resources including that of its pension funds, without tied conditions.

In a bid to make India's dialogue with Europe the "decisive conversation of the 21st century", there was a suggestion from India to start a bilateral *Horizon Dialogue* to help bring out a comprehensive India-EU strategy for 2050 (Govt. of India, 2018m). While such a long term approach is welcome, it is also important to have short-term targets when it comes to connectivity initiatives in order to ensure their effective implementation. This could be in the form of 'annual action plans' on the lines of the EU-China Connectivity Platform Annual Action Plan. The plan could include studies, technical discussions, capacity-building exercises, policy exchanges and workshops on connectivity as well as identification of projects for cooperation.

In the digital sector, the focus area of cooperation could be: *(i) 5G projects in India's rural areas on the lines of the EU-Brazil 5G Range project for accessing 5G network in Brazil's remote areas; (ii) collaboration between the 5G trial initiatives of India and the EU; (iii) tie-ups for harmonisation of 5G standards in India and the EU; and (iv) using India's End-to-End 5G Test Beds initiative (to promote research and innovation on 5G) to organise events on interoperability and hackathons*. The existing 'India-EU Cooperation on ICT-Related Standardisation, Policy and Legislation' should be strengthened to ensure promotion of new technologies related to Artificial Intelligence, 3D printing, Internet of Things, robotics and block-chain. Strengthening of links between the 'Digital India' and 'Digital Single Market for Europe' initiatives as well as efforts to boost the 'Start-up Europe India Network' would help in this regard.

Once India's Personal Data Protection Bill becomes a law, India and the EU could consider a framework on data flows on the lines of the EU-US Privacy Shield. Such a framework could be brought into effect to ensure that the fundamental rights of Indians (and the Europeans) are protected in cases where their data is transferred to the EU (and the data of citizens of EU member states to India). This will provide the commercial entities 'legal certainty' to conduct their businesses

Steps could be taken to ensure greater investments from the EU into the *Make In India* initiative through more partnerships on the lines of the '*Make In India Mittelstand*' programme (that aims to boost the presence of German MSMEs in India's manufacturing sector).

Trade connectivity can be enhanced through a Bilateral Trade and Investment Agreement (BTIA). Therefore, a decision to resume the BTIA talks should be expedited. The agreement should be comprehensive in nature and of high quality. BTIA negotiations on trade and investment chapters should be carried out simultaneously so that they can be concluded at the same time. The existing Investment Facilitation Mechanism should be made more effective to ensure greater European investments into connectivity-related sectors in India. At the multilateral front, India and the EU should uphold the WTO core principles and boost the rules-based multilateral trading system. They should also engage in looking into the issues affecting global trade and its governance in a manner that can help address developmental challenges.

Given the increasing inter-linkages between technology, trade, investment and infrastructure, a high-level working group comprising sectoral experts could be constituted to look into these aspects with a view to boost India-EU cooperation.

Various agreements that India has with individual European nations on connectivity-related issues should be analysed to find out synergies that can be incorporated into a comprehensive India-EU connectivity partnership action plan. As a first step a dedicated connectivity desk could be set up at the India-EU level and at the bilateral level with each EU member country to resolve issues.

Efforts could be made to boost European investment into India's ship recycling, aviation MRO and highways sectors. Initiatives could be taken to develop India-EU rail value chains through greater cooperation in digitalisation, safety measures, decarbonisation and development of coaches.

Twinning programmes for sea ports and airports could be initiated through sister port/airport agreements with the best ports in Europe. A mechanism could be devised to promote more partnerships between India and the EU entities to ensure valued-added services including those related to logistics at Indian ports as well as to improve road and rail connectivity at Indian ports. There is also a need for more dedicated mainland shipping services between India and Europe.

In the aviation sector, the existing India-EU horizontal agreement could be upgraded to a comprehensive agreement in a win-win manner. The upgraded pact could cover aspects related to regulatory cooperation, aviation security and safety, air traffic management modernisation and environment.

Existing mechanisms such as the India-EU Clean Energy and Climate Partnership and the EU's partnership with the India-led International Solar Alliance could be strengthened to ensure greater European investments and technology into India to boost renewable energy sector and energy efficient construction. Also, efforts should be made to identify opportunities for the participation of Indian commercial entities in connectivity projects initiated at the EU-level and in each EU member state.

In urban development sector, more smart cities could be included under the EU-AFD Smart City project with a focus on areas including urban e-governance and sustainable mobility. What could also help would be expansion of initiatives to boost sustainable urban development through 'city-to-city pairing and cooperation' between Indian and European cities, as well as initiatives such as Green Energy Corridors, Green Urban Mobility and Mobilise Your City.

People-to-people connectivity could be given a boost though Mutual Recognition Agreements on skills and academic qualifications. This will help in validation of skills as well as recognition of academic qualifications. Other measures could include increasing the number of ERASMUS EU-funded scholarships to Indian students and researchers to boost India-EU research and technology partnerships; and expanding the EU Intellectual Property Office collaboration efforts with the Indian government in Intellectual Property Rights awareness generation initiatives and capacity building programmes. India should closely follow the discussions for ensuring greater participation of non-EU countries in the Horizon Europe initiative and pitch for participating in Horizon Europe as a non-EU member on terms that will guarantee a fair chance to Indian entities to take part in projects under the programme. In this regard, India could consider being an associate member of the Horizon Europe programme by making a financial contribution to the programme's budget.

On the financial connectivity front, measures should be taken to: *(i) promote European investments including from pension funds in India in infrastructure financing instruments such as Infrastructure Investment Trusts (InvITs), Infrastructure Debt Funds (IDFs), Real Estate Investment Trusts (REITs) and Masala Bonds; (ii) promote ventures and partnerships between EU-based entities including pension funds and the Indian government-backed National Investment and Infrastructure Fund (NIIF) and India Infrastructure Finance Company Limited (IIFCL); (iii) Enhance European Investment Bank (EIB) investments in India's physical connectivity projects*

including in urban mobility and renewable energy; and (iv) create mechanism to set up a two-way 'financial corridor' on the lines of the one between India and Netherlands to help in identification of opportunities 'in as well as for' the financial sector (This could include promoting partnerships between Indian and European firms in the fields of clearing services and processing of high-end data to, in turn, boost ventures such as the International Financial Service Centre at Gujarat International Finance Tec-City).

On India-EU cooperation in connectivity initiatives in third countries/ regions, the areas with potential include integrating International North South Corridor (INSTC) with Trans-European Network-Transport (TEN-T) Core Network - especially "the North Sea-Baltic TEN-T Core Network Corridor, the Scandinavian-Mediterranean TEN-T Core Network Corridor and the Baltic-Adriatic TEN-T Core Network Corridor" as well as the planned Arctic Corridor. In this regard, a mechanism should be devised to use resources including the EU funds for transport infrastructure projects such as the Connecting Europe Facility-Transport (which has two the five European Structural and Investment Funds as well as a Cohesion Fund), the European Fund for Strategic Investments and the European Regional Development Fund. In addition to potential areas of India-EU cooperation including in the Indo-Pacific, there is also scope for EU to collaborate with India in initiatives such as the Asia Africa Growth Corridor, Trans-Asian Railway project; as well as the Bangladesh, Bhutan, India, and Nepal (BBIN) in waterways connectivity-related areas.

Lastly, it is important to carry out an impact evaluation of existing India-EU connectivity-related initiatives in order to determine whether to strengthen or reframe them to ensure optimal outcomes.

Endnotes

1 The EU has so far inked Strategic Partnership Agreements with Brazil, Canada, China, India, Japan, Mexico, South Korea, Russia, South Africa and the U.S.

2 The EU (including the UK) was the top destination of overseas direct investment from India in in 2015-16, 2018-19 and remains the topper in 2019-20 (April-November period) (Govt, of India, 2017a; Govt of India, 2019b).

3 ASEM is the inter-governmental dialogue process to strengthen ties between Asia and Europe. India is an ASEM member along with 20 other Asian nations and 30 European countries.

4 Also see Govt. of Japan websites on Society 5.0

[5] ASEM Members: Asia (Australia, Bangladesh, Brunei Darussalam, Cambodia, China, India, Indonesia, Japan, Kazakhstan, South Korea, Laos, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Russia, Singapore, Thailand and Vietnam) and Europe (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom) (Source: EU website on ASEM).

[6] Connectivity parameters: Physical (International flights passenger capacity, trade in electricity, trade in gas, Logistics Performance Index, border crossings, average connection speed, population covered by at least a 4G mobile network); E conomic/ financial (trade in goods, FDI, personal remittances (received and paid), trade in services, foreign portfolio investment liabilities and assets); Political (embassies network, UN voting alignment, participation in international intergovernmental organizations); Institutional (Regional trade agreements, visa-free or visa-on-arrival, cost to export/import, mean tariff rate, technical barriers to trade and signatory of TIR Convention); People-to-people (international student mobility in tertiary education, research outputs with international collaborations, patents with foreign co-inventor, trade in cultural goods, migrant stock, common language users, trade in cultural services and tourist arrivals at national borders); and

Sustainability Parameters: Environmental (renewable energy in total final energy consumption, primary energy use per GDP,

CO2 emissions per capita, domestic material consumption per capita, net forest loss); Social (population living below the intenational poverty line, Palma Index, tertiary graduates, freedom of the press, tolerance for minorities, presence of international NGOs, Corruption Perceptions Index, female labour-force participation and women's participation in national parliaments); and Economic/Financial (public debt as a percentage of GDP, private debt, loans and debt securities as percentage of GDP, GDP per capita growth, R&D expenditure as a percentage of GDP and proportion of youth not in education, employment or training) (Source: EU website on ASEM).

[7] The UK is no longer a member of the EU

[8] For details, see website of India Investment Grid

[9] For details, see websites of eSuvidha and e-Nivesh Monitor

[10] See the EU website for Horizon 2020

[11] The UK is no longer a part of the EU

[12] India has set up similar dedicated desks for non-European nations such as China, Israel, South Korea, Russia, Taiwan and the US.

[13] The UK is no longer a part of the EU

[14] Open Sky Air Services Agreement: where, on paper, two countries can permit an unlimited number of airlines to operate from the territory of either of them without any - or with only a limited number of - curbs including on the number of destinations, flights, price and seat.

[15] See the website of Smart City Mission Dashboard

[16] Not part of the EU

[17] The UK is no longer a part of the EU

[18] The UK is no longer a part of the EU

[19] The UK is no longer a part of the EU

[20] During the 2007-2017 period, the number of EU companies controlled by investors from 'China, Hong Kong and Macao' increased from around 5,000 to over 28,000, while in the case of Russia, the number went up from 1,600 to 12,000.

[21] For details, see the website of EU Treaties Office Database.

[22] The UK is no longer a part of the EU

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