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Gondwana: Economic Intergration of Indian Ocean Region

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Gondwana: Economic Integration of Indian Ocean Region

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Abstract

The Indian Ocean is emerging as a critical arena for global trade, strategic competition, and regional integration. India can serve as a hub, connecting countries in the Indian Ocean Region through a robust network of trade, investment, logistics, and digital infrastructure. In the backdrop of tensions in West Asia and disruptions at maritime chokepoints, the economic integration of Indian Ocean region can partially insulate countries of the region from shocks outside the region or on its periphery. This paper examines the feasibility and phasing of a regional trade bloc in the Indian Ocean Region (IOR) comprising economic aspects like trade, tourism, investment, and people-to-people connections. The paper devises economic and human connectivity indices to estimate the magnitude of connections between India and other IOR countries and identify areas for enhancing these connections. The opportunities for enhancing trade in minerals and energy within the IOR are also explored. Findings suggest that regional integration supported by stronger trade, investment, tourism, shipping, and people-to-people ties is both feasible and mutually beneficial for IOR countries. Leveraging diaspora connections, investing in transport connectivity, and harmonizing trade standards, could lay the foundation for an Indian Ocean Free Trade Area and subsequently an Indian Ocean Common Market.

Keywords: Indian Ocean Region, Human Connectivity, Economic Connectivity, Economic Integration, Free Trade Area, Customs Union, Trade Agreements

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1. Introduction

The Indian Ocean Region (IOR) is bordered by Africa to the west, the Straits of Malacca and Australia to the east, India to the north, and Antarctica to the south. The Indian Ocean, a major component of the IOR constitutes one of the world's most vital corridors of global trade and a major artery of international commerce. Nearly 100,000 ships transit through its waters annually, carrying around 30 percent of global containerized cargo and 42 percent of global crude oil traded from and within the region (Ahmat T, 2024). Several of the world's largest and busiest ports are located along the Indian Ocean rim. Moreover, three of the world's twenty largest shipping fleets—those of India, Malaysia, and Singapore—belong to Indian Ocean littoral states, with Singapore ranking among the top ten globally. The region is also rich in mineral and marine resources, further enhancing its economic significance.

Conflicts and geopolitical instability beyond the region impact trade & travel to and from IOR, even if the region itself is not directly involved. For instance, the Russia-Ukraine war disrupted air travel from IOR to Europe and beyond. The Houthi attacks in 2023 on ships moving between the Red Sea and Bab el-Mandeb, disrupted shipping from Indian Ocean to the Mediterranean Sea through the Red sea, forcing shipping traffic to go around the Cape of Good Hope to Western Europe. The Israel-Hamas-Iran conflict disrupted air traffic from IOR to Europe, forcing airlines to take longer routes (Mfame, 2024). Such disruptions have increased trade costs by lengthening shipping routes, delaying deliveries, worsening port congestion, and raising crew wages.[3] Countries in the IOR can minimise the costs of such shocks and disruptions to their own economy, by increasing intra-regional trade and tourism.

The Indian Ocean holds particular importance for India. It has been the most important channel for trade, cultural, technological and philosophical interaction with West Asia, East Asia and Africa, since ancient times (Roman empire). Currently, nearly 95% of India's trade by volume and 68% by value moves via Sea (Ministry of Ports, Shipping and Waterways). As the largest economy in the IOR it has the largest stake in reducing the effect of disruptions near the choke points. With its large population and historical human ties to most countries of the region, it also has an opportunity to bring the countries together at the people-to-people level.

This paper examines the feasibility and phasing of an FTA/CEPA and a potential Indian Ocean Common Market, inspired by the concept of a Gondwana Common Market (GCM) proposed in Virmani (2021, 2024).[4] The GCM envisions India as the curator, bringing together members from South Asia, the Indian Ocean, island nations, East Africa, and West Asia. India can serve as a pivotal hub for the Indian Ocean Region, connecting countries along the Indian Ocean, Gulf states, and island countries through a robust network of logistics, shipping services, aviation, and digital infrastructure, guided by geographic proximity (Virmani, 2021, 2024). India's deep-rooted civilizational ties and long-standing people-to-people linkages—extending even beyond the IOR—offer a valuable foundation for enhanced economic cooperation. The contemporary geopolitical and geo-economic environment, and contestation within the Indian Ocean's strategic location, provides both opportunities and threats for economic integration. A

[3] Climate change adds another layer of uncertainty to this already fragile system Climate-induced low water levels in Panama Canal led to drop in maritime traffic through the Panama and Suez canals- two critical arteries of the global trade (Review of Maritime Transport 2024, UNCTAD)

[4] In principle this could be extended to West Africa in future.

carefully phased program could help us exploit the former and steer delicately through the latter.

The remainder of the paper is structured as follows: Section 2 discusses the historical background of trade networks and people movement across the Indian Ocean Region, along with India's policy approach in the IOR. Section 3 reviews the relevant literature on regional integration and existing trade agreements in the IOR. This is followed by the data, definitions and methods of data analysis in Section 4. Section 5 examines the world's Pravasi connectivity with India, while Section 6 analyzes the economic and human foundation of a possible Indian Ocean Free Trade Area and its gradual transition into an Indian Ocean Common Market. Section 7 reviews the state of logistics connectivity in the IOR and section 8 explores the opportunities in Energy and Mineral Trade, and its use as the steppingstone for deeper economic integration. Section 9 delves into a deeper analysis, using augmented gravity model and PPML estimation to identify bilateral trade potential between India and rest of the IOR. Section 10 makes the concludes the paper, making the argument for Integration of the IOR with proposed timeline for integration and suggests clauses for an FTA/CEPA.

2. Indian Ocean: History and Policy

The key role played by the Indian Ocean in India's interactions with the known World since ancient times is highly underappreciated. The Indian Ocean has served as a key trade route with lands to the West and East of India, because of the nature and pattern of the monsoon. This facilitated not only the exchange of goods but also the movement of people and diffusion of culture. In the contemporary context, India hopes to leverage its geographic centrality and ancient cultural connections, to strengthen economic ties, enhancing physical and digital infrastructure and deepening people-to-people connections, for mutual benefit.

2.1 Historical Background

The Indian Ocean has served as a vital conduit of exchange for over five millennia, shaping trade, migration, and cultural diffusion across regions. Long before European ships entered these waters in the 1500s, maritime trade routes linking the Arabian Sea, Bay of Bengal, and Southeast Asia had already flourished. Seasonal monsoon winds facilitated the movement of goods, people, and ideas across this interconnected space.

Among India's earliest and most significant maritime engagements were its trading relationships with the Roman Empire and Southeast Asia. During the 1st and 2nd centuries CE, the Indo-Roman trade reached remarkable scale. Goods such as spices, textiles, metalware, and gold flowed from Indian ports to Roman markets, while customs taxes on trade through the Red Sea with India, Persia, and Ethiopia may have accounted for nearly a third of the Roman exchequer's revenue. The Muziris Papyrus, a surviving invoice from the Roman era, lists Indian goods purchased from a merchant based in Muziris (in present-day Kerala), valued so highly that a single shipment could buy 2,400 acres of prime Egyptian farmland or a luxury estate in Italy. As noted by historian William Dalrymple, "The scale of this trade eclipsed the more romanticized overland Silk Road." The concentration of Roman coins found along India's western and southern coasts—and their absence in China—further underscore the depth of this exchange. The trade between India and Rome increased following the conquest and annexation of Egypt by Rome. Even prior to Roman conquest, maritime links existed between Egypt and

India; one notable example of an early cultural exchange includes the use of Indian indigo-dyed muslin to wrap Egyptian mummies in the mid-2nd millennium BCE.

By the 3rd to 5th centuries CE, India's influence began extending eastward, culturally and religiously. Sanskrit inscriptions and Indian-style temple architecture began to appear across Southeast Asia, signaling vibrant trade links and the movement of merchants, artists, and scholars. By the 5th and 6th centuries, Hindu-Buddhist institutions had been adopted in Java, Thailand, and southern Vietnam, with Sanskrit or Pali becoming a prestige language of political and religious authority.

A notable example of this cultural transmission is the Khmer Empire, which rose to prominence in the 9th century CE in present-day Cambodia. The Khmer localized Indian political concepts such as chakravartin kingship and adopted Indian religious and architectural traditions. These influences flowed primarily through sustained maritime and overland connections with eastern Indian ports in Bengal and Odisha, as well as Tamil coastal kingdoms. The Chola dynasty, based in Tamil Nadu and active from around the 9th century onward, played a central role in shaping the cultural landscape of the Bay of Bengal. Their political influence, temple architecture, and artistic styles left an enduring legacy across Southeast Asia.

This legacy is most strikingly visible in the region's temple architecture. Major Hindu temples in Myanmar, Indonesia, Cambodia, Malaysia, and the Philippines reflect Indian and Chola artistic elements. The most famous among them is Angkor Wat, the world's largest Hindu temple, built in the early 12th century by Suryavarman II of the Khmer Empire. Originally dedicated to Vishnu, it was later converted into a Buddhist site of worship.

Beyond cultural diffusion, Indian Ocean trade also fostered the movement of goods and people across great distances. Indian textiles, especially from Gujarat, were exported to the coasts of Africa, Indonesia, and possibly even the northern shores of Australia (Davis and Balls, 2019). In return, Indian ports received goods like spices, precious stones, timber, and local produce. Trade routes also facilitated migration from the Persian Gulf and East Africa to Southeast Asian ports like Melaka (in modern-day Malaysia), facilitating movement of ideas, cultures and religions. Buddhism travelled to Southeast Asia between the 1st and 5th centuries CE.

India and Vietnam share particularly deep-rooted civilizational ties. From the first millennium CE onward, Indian merchants, artists and monks introduced art, architecture, philosophies, and religious practices to Vietnam. Archaeological and textual evidence suggests a robust exchange, with India exporting textiles, metals, spices, and religious objects, and Vietnam likely providing precious stones, timber, and agricultural goods in return.

Genetic studies have further expanded our understanding of these interactions. Recent research cited by Davis and Balls (2019) reveals a high degree of human migration across the Indian Ocean dating back thousands of years—far preceding the well-known expansions of South Indian empires into Southeast Asia. One such study highlights the ancestry of the Malagasy people in Madagascar, who are genetically linked to migrants from modern-day Indonesia, suggesting the far-reaching impact of Indian Ocean migration.

In the nineteenth century, maritime connections across the Indian Ocean entered a new phase with the rise of European colonial powers. British ships traveling to and from Australia routinely passed through Indian Ocean routes, linking Australia with key Indian ports such as Calcutta, Bombay, and Madras. By the latter half of the century, the Indian Ocean had become

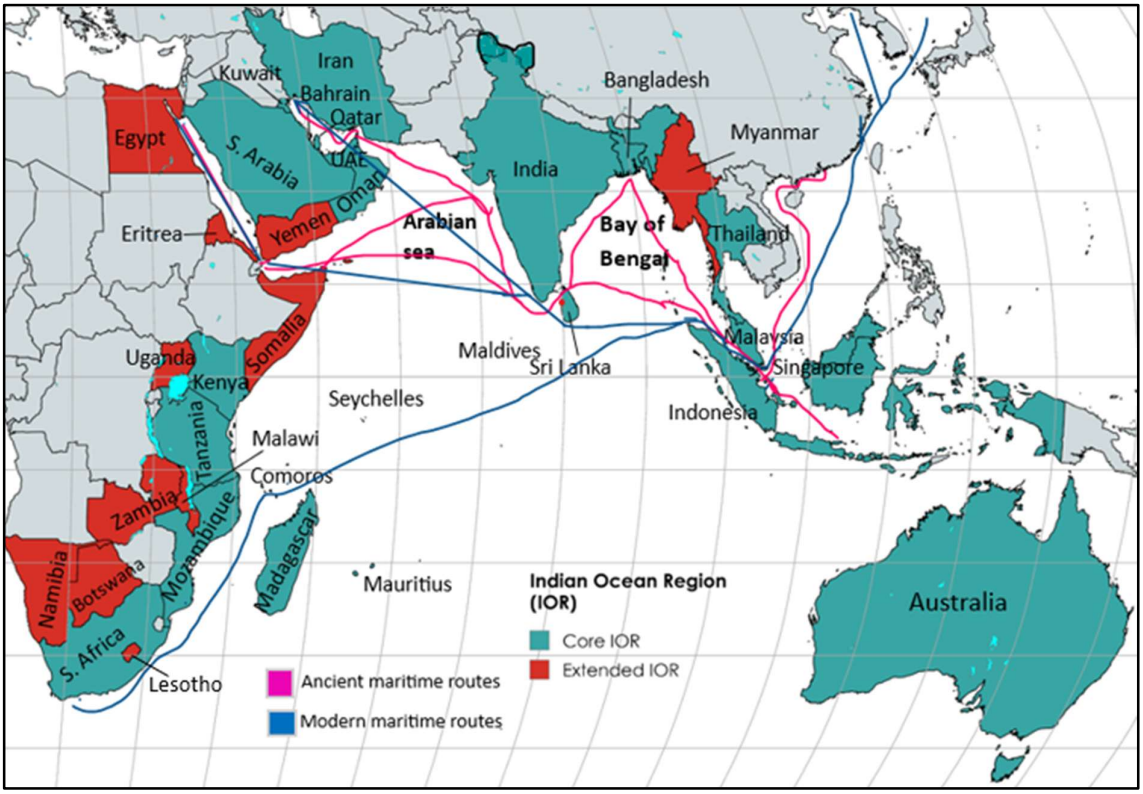
a vital artery in global shipping and commerce, serving as a strategic corridor between Europe, Asia, and the Pacific.

In the early 20th Century, nearly a third of the Arabian Peninsula was ruled as part of the British Indian Empire. From Aden to Kuwait, a crescent of Arabian protectorates was governed from Delhi, overseen by the Indian Political Service, policed by Indian troops, and answerable to the Viceroy of India. Under the Interpretation Act of 1889, these protectorates had all legally been considered part of India." Sam Dalrymple (2025).[5]

Following the end of colonial rule and the subsequent conclusion of the Cold War, the geopolitical and economic landscape of the region began to shift. New trade routes emerged, reinforcing the Indian Ocean's role as a central hub in a rapidly globalizing world. Port cities such as Perth, Durban, Mumbai, Kolkata, Singapore, Jakarta, and Colombo—along with critical chokepoints like the Strait of Malacca and the Strait of Hormuz—transformed into key nodes in an expansive maritime network (Davis and Balls).

The historical maritime routes (in pink) across the Indian Ocean Region, stretching from the Persian Gulf to the Strait of Malacca via the Indian subcontinent, are depicted in Figure 1. These routes traverse the Arabian Sea, the Bay of Bengal, and the broader Indian Ocean. A similar route also extends from the Red Sea to the Malacca Strait and continues farther east.

Figure 1: Map of the Indian Ocean Region



Source: Authors' illustration of IOR and Dalrymple (2024) (for ancient maritime routes) and Notteboom et al. (2022) , for modern maritime routes.

[5] Dubai: When the glittering city and other Gulf states almost became part of India

2.2 India's Policy Approach

The 'Neighborhood First Policy' of India guides the management of India's relations with its immediate neighboring countries, focusing on creating mutually beneficial, people-oriented, regional frameworks, including the building of physical, digital, and people-to-people connectivity[6]. This policy is guided by four key principles of Samman (respect), Samvad (dialogue), Shanti (peace) and Samriddhi (prosperity). From an economic viewpoint, Samriddhi, i.e., working towards mutual prosperity through economic cooperation and development, is crucial. Samriddhi, however, must be supported by three other key principles that maintain stability in the region, recognize the sovereignty of neighbors and engage in open and honest dialogues with neighbors.

To address maritime security issues such as piracy, terrorism and natural disasters in the Indian Ocean, protect its strategic interests (Parmar, 2024) and leverage the blue economy (D'Cruze et al., 2024), the Union government initiated a more proactive foreign policy. In 2015, India launched the Security and Growth for All in the Region (SAGAR) initiative to emphasize maritime security and economic cooperation in line with its geopolitical position in the Indian Ocean Region. The initiative also provides an alternative to China's Belt and Road initiative in the region and expands the choices available to countries in the region. The Indian Ocean is a vital trade route, with significant economic potential. SAGAR aims to boost trade and investment among the littoral states, thereby increasing India's economic presence in the region (Wolodin, 2024).

3. Context of Economic Integration

3.1 Experience of Regional Economic Integration

The European Union is a classic example of strong regional economic integration. Its evolution from a European Coal and Steel Community (ECSC) to a Monetary Union brought along multiple economic benefits for its economy and society. The ECSC started its journey in 1951 with six countries (Belgium, France, Germany, Italy, Luxembourg, Netherlands) in 1951, with the task of managing coal and steel production under a supranational authority. In 1957, the six nations established the European Economic Community (EEC) with the aim of creating a common market. As a result, the ECSC eliminated trade barriers, boosted intra-European trade in goods and services, including maritime transport, critical for industrial supply chains (Denhousse, 2011). In 1960s, the EEC expanded its number to 9 members, forming a customs union with a common external tariff. With the aim to complete the single market by 1992, the Single Market Act was implemented to eliminate barriers to trade in services, including port-related logistics. As reported by a 2019 European Commission study, the Single Market increased the GDP growth of its member states by roughly around 1-2% annually, with services trade contributing significantly. In the 1990s, the European Union was formed with deeper integration, solidifying not only trade in goods and services, but also reducing transaction costs, exchange rate stabilization, and improved energy and transport infrastructure. The free movement of people enhanced labour mobility in services and fostered cultural exchange. An added advantage of the economic integration was the EU's negotiating power in global trade agreements.

[6] Lok Sabha starred question no-262 posed by Shri Manish Tiwari and answered on 13.12.2024 by S. Jaishankar, Minister of External Affairs

Other regions such as America have achieved varying degrees of integration (Ravi, 2025), with trade blocs such as NAFTA in North America and MERCOSUR in South America. The intra-regional trade relative to the region's total global trade exceeds 80 percent for the EU, 40 percent for ASEAN, and less than 5 percent for South Asia- a very small proportion. Engaging in greater trade outside the region not only results in higher logistics costs but also raises the prices of regional goods in the international markets, rendering them less competitive at the global level (Ravi, 2025).

While trade in goods is essential for economic integration, opening national borders for investment flows and having common standards and regulatory frameworks helps achieve the goal of regional integration (Ravi, 2025). Taking advantage of geographical proximity, manufacturing within the region can reduce production costs, logistics expenses, and give access to a large pool of skilled labour (Ravi, 2025).

To improve regional connectivity in South Asia, between South Asia, Middle East and South-east Asia, projects like India-Myanmar-Thailand trilateral corridor (extending to Vietnam) and the India-Middle East-Europe Economic (IMEC) corridor have already been initiated. These are expected to enhance transportation connectivity in South Asia (Ravi, 2025). The Sittwe Port in Myanmar- constructed by India and the air and ferry services with Sri Lanka (Sinha, 2025) illustrate transportation connectivity in South Asia. The Asia-Africa Growth Corridor (AAGC) is an example of a strategy that looks to rediscover ancient sea routes and create new sea corridors by connecting ports in India, Africa, and Myanmar (Davis and Balls, 2019). Additionally, digital integration (Ravi 2025; Virmani, 2024) and liberalization of energy markets for cross-border energy commercialization (Ravi, 2025) can lead to profound regional integration. For example, India and Sri-Lanka relations in the renewable energy sector can be used to construct an oil pipeline, connect electricity grids and deploy and export wind energy to India (Weerakoon, 2025), thereby harnessing the energy connectivity potential between these nations, that can be further extended to the IOR.

The DHL Global Connectedness Index- a measure of globalization- measures the depth and breadth of a country's integration with the rest of the world as exhibited by its inclusion of international flows in trade, capital, information and people. Depth measures the size of international flows and breadth measures the distributions of flows around the world compared to a relevant measure. Although the DHL study constructs the index on integration of countries, our study constructs connectivity indices on trade and tourism from the perspectives of India and its partner country and an FDI index from the perspective of India.

While geographical proximity plays a crucial role in fostering deeper economic integration, cultural practices, traditions and legacies also play a role in shaping economic relationships (Bajpai, 2021). Factors such as ancient civilization, historical empires and religion provide a cultural space that can boost trust, generate goodwill and facilitate economic exchange between nations (Nye, 2020). Some examples of soft power diplomacy backed by culture include the Asian Car Rally in 2016 and the Kashi Corridor Project in India (Vijay, 2025). The Asian Car Rally highlighted several historical ties between India, Myanmar, and Thailand, such as religion, language, art, architecture, etc., that can "complement economic and political initiatives by reinforcing shared histories and values" (Vijay, 2025). The Kashi Corridor project demonstrated significant economic impacts of cultural projects by attracting millions of visitors and thereby boosting local economies (Vijay, 2025). Even the EU is founded on a set of shared

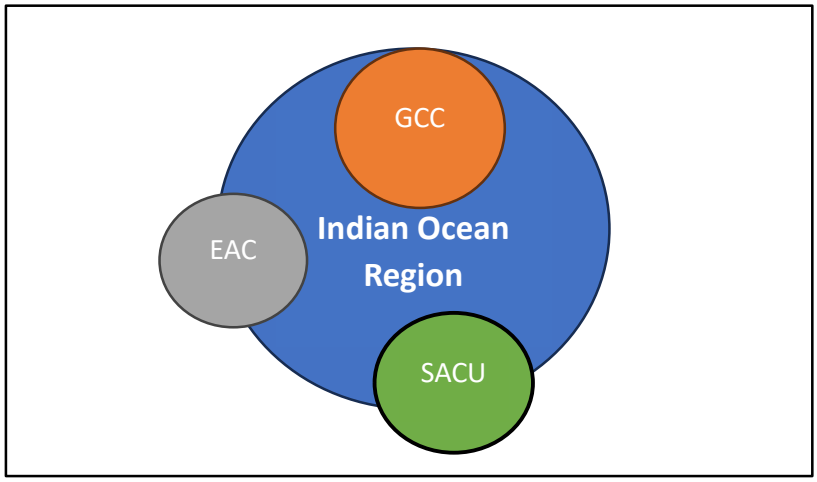
cultural values such as rich cultural diversity across member states, common history, including influences from ancient Greece, Rome and Renaissance and commitment to peace and stability.

3.2 Trade Agreements in Indian Ocean Region

Many countries in the Indian Ocean have signed multiple bilateral and plurilateral trade agreements. Additionally, many countries have formed trade blocs that are either Free Trade Areas or Customs Union. A Free Trade Area is an agreement between two or more countries to reduce or eliminate trade barriers like tariffs or quotas on goods and services between them. This kind of agreement increases trade and economic integration among member countries while allowing each member country to maintain its own trade policies with non-member countries. A customs union is a deeper economic integration with countries having a common external tariff in addition to reduced lower internal tariffs.

Within the Indian Ocean Region, three trade blocs, viz., Gulf Cooperation Council (GCC), East African Community (EAC) and the South African Customs Union (SACU) are known to be Customs Union. having a common external tariff. Figure 2 shows the extent of overlapping of these trade blocs with the IOR. The GCC is completely part of the IOR, EAC has three of its seven members in the IOR (2 core and 1 extended) and SACU has four out of five (1 core, 4 extended) members in the IOR.

Figure 2: Trade Blocs in IOR with a Common External Tariff



Other trade agreements that the IOR countries are part of are Free Trade Agreements. These include ASEAN's AFTA, RCEP, CPTPP, SAFTA, Common Market for Eastern and Southern Africa (COMESA) and South African Development Community (SADC).

For there to exist economic integrations such as the Indian Ocean Free Trade Area we need to consider any restrictions from GCC, EAC and SACU that may restrict the members of these trade blocs from entering into individual trade agreements with non-members. Let us examine them one-by-one.

The GCC is a customs union comprising of six Gulf countries- UAE, Bahrain, Qatar, Kuwait, Saudi Arabia, and Oman, formed based on geographical proximity, similar political systems based on Islamic beliefs, joint destiny and common objectives. While GCC maintains a common external tariff policy, its member states retain flexibility to negotiate bilateral trade agreements with non-GCC countries. Notable examples include the UAE-India

Comprehensive Economic Partnership Agreement (CEPA) and Saudi Arabia-South Korea Bilateral Investment Agreement. These agreements enable individual GCC countries to pursue external trade relationships while still adhering to the broader economic framework of the GCC.

The EAC is made up of Burundi, Democratic Republic of Congo, Kenya, Rwanda, South Sudan, Tanzania and Uganda. SACU on the other hand has 5 members, viz., Botswana, Eswatini, Lesotho, Namibia and South Africa. As EAC and SACU are already customs Union, their IOR member states will have to negotiate with them to allow easy integration of individual countries into the IOR. Any changes in the rules or origin or common external tariff policy will have to be aligned with the interests of all Indian Ocean FTA members. Kenya and Tanzania, for example can convince EAC members for this change, given the economic size of these countries. Similarly, South Africa having the highest GDP in SACU can convince its fellow member states to align with the trade policy of IOR. If the potential partners- Lesotho, Botswana and Namibia are willing to join the IOFTA, things become easier.

4. Data, Definitions and Methods

The Indian Ocean Region Association (IORA), an intergovernmental organization was established in 1997 to promote regional cooperation, economic integration and sustainable development among countries bordering the Indian Ocean. Although the organization has made some progress in trade and investment facilitation, its overall impact remains limited. Using IORA as its base, this study proposes the formation of a Core IOR, a region that could form the core of an Indian Ocean Region Economic Community, Indian Ocean Free Trade Area and in the further future, an Indian Ocean Common Market.

IORA currently has 23 member states. To this list of IORA members, we add GCC members who aren't already part of IORA and remove Somalia and Yemen to obtain the list of Core IOR nations. Yemen and Somalia have not been included in the list of Core IOR, because of the ongoing maritime issues such as piracy and insecurity in Somalia and the ongoing war of Yemen with the Houthis since 2020. These two nations have therefore been shifted to the list of Extended IOR.

The Extended IOR contains the list of countries that can be potential partners in the Indian Ocean Economic Community. This potential is based on the geography of the country and its human connectivity with India (based on Human Connectivity Index (HCI) discussed below). If a country's HCI is less than 0.5, we don't include them in the extended list.

The Island Nations in the Indian Ocean Region include Comoros, Madagascar, Maldives, Mauritius, Reunion, Seychelles and Sri Lanka. The Littoral States are Australia, Bahrain, Bangladesh, India, Indonesia, Malaysia, Iran, Kenya, Kuwait, Qatar, Saudi Arabia, Oman, Mozambique, Singapore, South Africa, Tanzania, Thailand and the UAE. The nations in the Extended IOR additionally include Botswana, Egypt, Eritrea, Lesotho, Malawi, Myanmar, Namibia, Somalia, Uganda, Zambia and Yemen.

Figure 1 depicts geographical positioning of the Core IOR and Extended IOR countries and the blue lines depict the modern maritime trade routes in the Indian Ocean Region. These extend from the Persian Gulf and Red Sea in the east to the Strait of Malacca in the west, akin to

ancient maritime routes. Additionally, one shipping route also stretches from the Cape of Good Hope at the southern tip of Africa to the Strait of Malacca.

As trade forms the main component of the first phase of economic integration- Free Trade Area- the study examines the bilateral trade connectivity in goods and services in the Indian Ocean Region. Given India's geographical and strategic location in the Indian Ocean, the bilateral trade connectivity is examined between India and its partner IOR countries using a '*Trade in Goods and Services Index (TGSI)*'. The index is constructed from India's perspective and foreign country's perspective. WITS is used as the data source for goods trade and WTO Stats as the data source for services[7] trade. The goods and services trade data are summed to get the total trade- export and import – in goods and services. The following ratios are used to construct the TGS index from India's perspective denoted as TGSIi:

i) Exports from India (% total Indian exports)

ii) Imports to India (% total Indian imports)

The average of (i) and (ii) gives us TGSIi. The same index- TGSIf is constructed from a foreign country's (X) perspective using (iii) and (iv).

i) Exports to India from X (% total exports of X)

ii) Imports from India to X (% total imports of X)

The average of TGSIi and TGSIf gives us TGSI, a combined measure of goods and services connectivity between India and its IOR partners.

As trade follows investment, it is pertinent to capture the connectivity between India and other IOR countries on the investment parameter, measured by FDI. As the required data on FDI is not accessible, an FDI index is constructed only from India's perspective. We use FDIIi to denote Foreign Direct Investment Index- India perspective. It is constructed using the average of (i) FDI into India from X (% of total FDI into India) and (ii) Outward Direct Investment (ODI) from India to X (% of total ODI from India).

Human connections can be channeled to improve and strengthen economic relations between countries. Leveraging the human connectivity between India and its partners can help countries supplement their efforts to increase economic ties. For this purpose, this paper constructs a *Human Connectivity Index (HCI)* from the perspective of India's partner country, indicating the strength of their present Pravasi connection with India. The HCI is constructed using a weighted average of (a) remittances sent by foreign country to India (as a % of foreign country's outward remittances) and (b) Indian migrant stocks in foreign country (as a % of foreign country's total population). The ratios are derived using data from World Bank and Knomad's Bilateral Remittances and Bilateral Migrant Stocks matrices.

[7] Services are commercial in nature. These include transport, travel, goods related services and other commercial services. Other commercial services include construction, insurance and pension services, financial services, telecom, computer and information services, personal, cultural recreational services, other business services, charges for use of intellectual property n.i.e. and services not allocated.

5. Human Foundation of Trade: Pravasis

Indians have over the past several decades migrated to regions and nations around the globe. The country's migration history dates to the British colonial era, which ended in 1947 with independence and the partition with Pakistan. Over time, three major waves of emigration stand out. The first occurred during the colonial period when indentured laborers were forcibly moved to work in other parts of the British Empire. British Guiana became the first Caribbean territory (although located in South America) in 1838 to be immigrated by Indian workers, sent forcefully by the British empire. This suit was followed by sending Indian workers to Mauritius or other Caribbean territories such as Jamaica, Trinidad, St. Vincent, St. Kitts and Grenada. The second wave came during the struggle for independence and the eventual collapse of colonial rule. More recently, migration has been driven by job opportunities, particularly in the Persian Gulf and wealthier Western countries (Singh, 2022).

The large number of Indian migrants abroad gives a boost to India's image abroad and also boosts its economic growth through inward remittances, trade and foreign investment- direct and portfolio both (The Economist, 2024). As reported by the Economist, the Indian diaspora has been the largest in the world since 2010. As per United Nations[8], India topped the list of countries with the largest diasporas, with 18 million people (~1.2% of India's population) from India living outside their country of origin. The total international migrants reached 281 million globally, in 2020. In 2022, the personal remittances received by India were more than 111 billion USD which is 3.3 percent of India's GDP. These numbers increased to 137 billion USD and 3.5% in 2024 (World Bank databank)[9]. Some of the migration resulted after the "second world war including the refugees and conflict-driven migration resulting from partitions of India and Pakistan in 1947, Bangladesh's War of Independence in 1971, and Sri Lankan civil war".

To measure and analyze this element of migration, we use the measure of human connectivity, that measures the strength of people-to-people connectivity of countries-inhabited by Indians-with India. This people-to-people connectivity or human connectivity is measured by the Human Connectivity Index discussed in the above sections (HCI).

5.1 Human Connectivity Index (HCI)

The index is constructed and analyzed for a total of 204 countries. A regional average is constructed by dividing countries into the regions of North America, EU, Non-EU, ASEAN, Indian subcontinent, Latin America and Caribbean (LA & C) and Africa. Since HCI is concerned with Indian migrants, we further divide LA & C and Africa into Commonwealth and Non-Commonwealth nations. The idea behind this division is that the commonwealth countries were British colonies where Indian plantation workers and indentured labourers were sent by the British colonizers. It is expected that the commonwealth countries would be more connected with India than the non-commonwealth members.

[8] In International Migration 2020 Highlights.

[9] Personal remittances comprise personal transfers and compensation of employees. See https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT?end=2024&most_recent_year_desc=true&start=1970 for detailed definition and figures for other countries.

Table 1 depicts the average HCI for various regions, sorted in descending order of their human connectivity with India. It can be observed that the Gulf region[10] has the highest people-to-people connectivity with India at HCI= 29.4. The Middle East exhibits strong connectivity with India primarily due to historical trade routes in the Indian Ocean and large-scale migration of low-skilled workers for employment. Five of the six GCC members have an HCI above 30, with Saudi Arabia (6th member) having an HCI of 18 (Table 2).

Table 1: HCI: Regional Averages

Table: Regional Average_ HCI						
Region	**HCI: non-zero**		**Total HCI**		**TGIi with non-zero HCI**	**Total TGI**
	No.	**Avg**	**No.**	**Avg**	**Avg**	**Avg**
Gulf	7	29.4	9	22.9	2.6	2.06
Indian subcontinent	6	22.7	6	22.7	0.6	0.62
Oceania	5	8.1	13	3.1	0.5	0.3
Commonwealth of LA & Caribbean*	10	5.4	13	4.2	0.0	0.0
ASEAN	9	5.0	10	4.5	1.2	1.1
Commonwealth Africa	11	4.8	18	3.1	0.3	0.3
North America	3	4.0	3	4.0	4.7	4.7
Non-EU members	9	1.2	16	0.7	0.7	0.4
European Union	27	1.1	27	1.1	0.4	0.4
Rest of Africa	7	1.0	33	0.2	0.14	0.11
Rest of LA & C	12	0.3	20	0.2	0.3	0.2
Note: Total HCI includes countries where either data is missing or where either variables' value in HCI is zero						

The Indian subcontinent has the second highest average human connectivity with India (as measured by HCI) fostered by geography and colonial legacies The subcontinent's average HCI is equal to 22.7. Out of the 6 countries in the Indian subcontinent, Bhutan and Nepal are highly connected with India, with India receiving more than 90% of their total remittances paid. Sri Lanka and Maldives follow with their HCI being around 16 and 17. The presence of many Tamilians in Sri Lanka corroborates its high human connectivity with India. The region's average connectivity with India is lower than that of Gulf due to forced outward migration of minorities from West Pakistan (now Pakistan) and East Pakistan (now Bangladesh) during partition, and the relatively lucrative employment opportunities available to low-skilled workers in India.

[10] Comprising of Iraq, Oman, Qatar, Bahrain Kuwait, UAE and Saudi Arabia. Note Iraq is not a member of GCC.

Table 2: Countries highly connected with India- based on HCI

Human Connectivity Index for Top 80 countries								
Region	**S. No.**	**Country**	**HCI**		**Region**	**S. No.**	**Country**	**HCI**
ISC	1	Bhutan	50.7		LA&C	41	St. Lucia	2.8
GCC	2	Oman	47.7		ASEAN	42	Indonesia	2.4
ISC	3	Nepal	47.4		BOT	43	Cayman Islands	2.3
GCC	4	UAE	40.2		EU	44	Italy	2.3
GCC	5	Bahrain	34.0		ASEAN	45	Vietnam	2.1
GCC	6	Kuwait	33.5		EU	46	Denmark	2.1
GCC	7	Qatar	32.3		EU	47	Finland	2.0
IO	8	Seychelles	31.3		Africa	48	Madagascar	1.9
CW LA&C	9	Guyana	19.9		EU	49	Netherlands	1.9
ASEAN	10	Myanmar	19.4		Rest of LA&C	50	Panama	1.9
ISC	11	Sri Lanka	18.1		Non-EU	51	Norway	1.8
GCC	12	Saudi Arabia	18.0		EU	52	Cyprus	1.8
CW Africa	13	Mauritius	17.8		EU	53	Curacao	1.6
ISC	14	Maldives	16.9		CW Africa	54	South Africa	1.6
CW LA&C	15	Suriname	13.7		Rest of Africa	55	Eritrea	1.5
Oceania	16	Tonga	12.7		W. Asia	56	Israel	1.5
Oceania	17	Australia	10.0		EU	57	Germany	1.4
Oceania	18	New Zealand	10.0		CW Africa	58	Mozambique	1.2
ASEAN	19	Singapore	9.0		Rest of Africa	59	Liberia	1.2
CW Africa	20	Zambia	9.0		CW LA&C	60	Bahamas	1.1
CW Africa	21	Lesotho	7.8		EU	61	Belgium	1.1
N. America	22	Canada	7.5		EU	62	Aruba	1.0
CW LA&C	23	Jamaica	7.4		EU	63	Latvia	1.0
Oceania	24	Fiji	7.3		EU	64	Malta	0.9
Non-EU	25	United Kingdom	7.2		Rest of Africa	65	Libya	0.9
CW Africa	26	Botswana	6.2		Asia	66	Japan	0.9
CW Africa	27	Tanzania	5.9		EU	67	Greece	0.9
ASEAN	28	Malaysia	4.5		EU	68	Austria	0.9
N. America	29	United States	4.4		ASEAN	69	Thailand	0.8
BOT	30	Bermuda	4.3		CW Africa	70	Namibia	0.8
CW LA&C	31	Barbados	4.2		EU	71	Luxembourg	0.8
ASEAN	32	Philippines	3.9		EU	72	Czech Republic	0.8
CW LA&C	33	Trinidad	3.6		Non-EU	73	Switzerland	0.8
CW Africa	34	Sierra Leone	3.5		EU	74	Estonia	0.7
CW Africa	35	Malawi	3.2		CW Africa	75	Uganda	0.7
EU	36	Ireland	3.1		EU	76	Portugal	0.7
ASEAN	37	Brunei	3.1		EU	77	France	0.7
LA&C	38	Sint Maarten (Dutch	3.1		Rest of LA&C	78	Peru	0.6
ISC	39	Bangladesh	2.9		EU	79	Lithuania	0.6
EU	40	Sweden	2.9		Non-EU	80	Iceland	0.6
Note: ISC is Indian Subcontinent, IO is Indian Ocean and BOT is British Overseas Territory								

If we compare the change in the proportion of minorities in West Pakistan, East Pakistan and India between 1941 and 1951, we observe the biggest percentage point decrease in West Pakistan. In West Pakistan minorities declined by 17.26 percentage points, in East Pakistan by 9.8 percentage points and in India by approximately 5.2 percentage points. According to latest estimates in 2022, the proportion of minorities declined in Bangladesh by 14.25 percentage points from 1951.[11]

Seychelles, an island nation in the Indian Ocean also has a high human connectivity with India, measured by HCI=31.3.

Oceania forms the third most connected region with India at people level, given its average HCI of 8.11. Tonga, Australia and New Zealand have an HCI of 10 or more while Fiji maintains an HCI value around 7 (Table 2). Fiji, unlike the other Oceania countries, experienced significant migration of Indian indentured labourers. After their contracts ended, many labourers stayed behind forming a significant Indo-Fijian community, some of which migrated to Australia and New Zealand in early 2000s. In the colonial era, many Indians-Punjabis, Gujaratis and Sindhis- migrated to Australia and New Zealand as hawkers, labourers or owners of small businesses. According to recent estimates, over 240,000 Indian-New Zealanders (2023 estimate) and over 780,000 Indian-Australians (2021 Census) form a significant and vibrant diaspora. Further, although the number of Indian migrants in Tonga are very small, their HCI value with India is highest in Oceania (12.7).

The Commonwealth members of Latin America and Caribbean have an average HCI of 5.4 with Guyana, Suriname and Jamaica exhibiting the highest people-to-people connectivity with India. After the abolition of slavery in Africa, Indians were sent to Guyana (British Guyana), Suriname, Jamaica, Trinidad and Tobago and Barbados as indentured labourers on 5–10-year contracts by colonials. These workers were mainly from Bihar, Uttar Pradesh and Bengal. While many workers returned to India, majority of these workers stayed back after their contracts ended. Indian migrants today make up around 40% of Guyana's population and Suriname 27%. Suriname, although not a Commonwealth country, was inhabited by Indian indentured labourers. The Dutch colonial government recruited indentured labourers from British India to work on plantations. From table 2, it can be observed that Guyana and Suriname rank 9 and 13 on the human connectivity index with India.

The average HCI of ASEAN (in Southeast Asia) is significantly less than that of Gulf and the Indian subcontinent. The average ASEAN HCI is equal to 5. Myanmar is the most connected country with India at people level (HCI= 19.42), followed by Singapore (~9), Malaysia (~4.5), Philippines (~3.9), Brunei (3.09), Indonesia (~2.4), Vietnam (~2.1), Thailand (~0.8) and Cambodia (0.05). Further, Myanmar, Singapore and Malaysia feature in the top 30 countries with a positive human connectivity with India, as seen in Table 2. Indians migrated to South-East Asia with significant movements occurring over several centuries, driven by trade, cultural exchange and religious dissemination. These movements include maritime trade via the Bay of Bengal and the Indian Ocean that brought Tamil, Gujaratis and other Indian communities to South-East Asia. The Chola kingdom also had a profound influence on the artistic styles of

[11] The data is based on Census of Pakistan and Bangladesh, collected and reported by India Today and also on Bangladesh Bureau of Statistics' Population and Housing Census, 2022 2022 data. https://www.indiatoday.in/india/story/pakistan-bangladesh-non-muslim-population-citizenship-amendment-bill-bjp-1627678-2019-12-12

South-East Asia, reaching its peak in the 11th century. Many Indian style Hindu temples can be seen today in Myanmar, Indonesia, Cambodia, Malaysia and the Philippines. The present-day Tamil Nadu, that was once the land of Chola empire, in fact has a large diaspora in Southeast Asia. However, the proportion of Indian migrants in ASEAN countries is quite low. But the proportion of remittances sent to India is more than the proportion of Indian migrants in ASEAN countries.

The Indian Ocean for many centuries had been the centre point of global trade. These global trading networks facilitated the trade of textiles originating in Gujarat to be sold around the African Coast, Indonesia and parts of Northern Australia (Australia India Institute). This in turn led to migration thereby leading to some degree of human connectivity with India.

Amongst the East African coastal nations, Lesotho ranks the highest (7.81) with others exhibiting an HCI of less than 5. For Kenya however, no data is available.

For comparison, Africa is divided into Commonwealth and non-Commonwealth nations. Under commonwealth category, the average HCI is 4.8, whereas for non- Commonwealth category this number is a staggering low of 0.3 – a wide difference. In fact, no country in Africa that is not a Commonwealth country has an HCI over 2. Kenya, a commonwealth country, today has a small number of resident Indians; but there is neither any information available on the Indian migrant stock there nor is there any information on the remittances being sent by them to India. Zambia, Lesotho, Botswana and Tanzania- all members of the Commonwealth also lie in list of top 30 highly connected (at people level) countries.

When examining the HCI of North America, it is found that the average HCI is 4. This average value is mainly dominated by Canada and U.S. than have HCI equal to 7.54 and 4.36. Compared to this, the HCI of Mexico is only 0.14, a negligible amount. Although U.S. is the second largest host of Indian migrants, the proportion of Indians in Canada is relatively higher and so are the proportion of remittances to India.

The European Union has an average HCI of 1.1 with Ireland taking the top spot with HCI=3.13. For 16 non-EU members the average HCI is higher at 1.2 with U.K. having the highest HCI of 7.25. In fact, amongst the western countries, UK has the 4th highest human connectivity with India.

Overall, the analysis underscores the significant role of historical migration, colonial legacies, and economic factors in shaping human connectivity. While geographical proximity remains a major determinant, historical trade ties and labour migration continue to influence connectivity patterns between India and other regions.

6. Economic & Human Foundations for FTA

This section makes a case for the economic integration of the Indian Ocean Region based on diaspora connections, enhanced trade, investment and tourism. Our proposal of an Indian Ocean Free Trade Area and its phasing into an Indian Ocean Common Market is supported by the work of Akintola et al. (2022) that evaluates the effects of gradual tariff cuts on IORA and the impact of tariff cuts, non-tariff measures reduction and trade facilitation using a CGE approach. Their study finds that compared to open regionalism (as seen in Indian Ocean Rim Association), IORA countries' real GDP increases especially for countries belonging to lower middle income and low-income groups. The cumulative change in the real quantity of exports

and imports by IORA countries also witnesses an increase. India's import demand would be the fourth highest in the case of tariff cuts along with non-tariff measures reduction. The study also highlights the investment benefits that would be derived from deeper economic integration such as IORA-CEPA.

This section also explores the opportunities that exist to initiate IOR economic integration with a Free Trade Area based on energy and minerals trade. As logistics connectivity plays an essential role in deepening economic integration, the section further discusses the status of shipping connectivity in the IOR and measures to improve it further.

6.1 India's Trade and Human Connectivity

The Indian Ocean Region is comprised of 24 countries (and Reunion) with India geographically placed at its center. To explore the opportunity to deepen economic ties in the Indian Ocean Region this study takes India as the benchmark country. The importance of India to its partner IOR countries and vice versa is investigated in the trade in goods and services sector, both being important in the formation and phasing of the Indian Ocean Economic Integration. Measuring human connectivity between India and its IOR partners will act as a tool for promoting the economics of the IOR integration.

But how important is the Indian Ocean Region in world trade, GDP and Net FDI inflows and outflows. Tables 3 depicts the aggregates for the Core and the Extended IOR. The core IOR has a share of 11.1 percent in the world GDP, 14.1 percent in world goods trade and 13 percent in world (commercial) services trade in 2023. The net FDI inflows of the core IOR accounts for 33% of the world share, i.e. the Core IOR receives one-third of the world net FDI inflows. The share of extended IOR in world GDP is 11.6%, 14.6% in goods trade, 13.4% in services trade and 34.8% in Net FDI inflows.

These tables further depict the averages of the Core IOR and how adding peripheral countries (i.e. countries falling only in Extended IOR) pulls down the averages. For example, the average GDP of the core IOR countries is $490 billion with their average goods trade amounting to $284 billion and services trade amounting to $79.8 billion in 2023. However, as shown in Table 4, the average GDP of the Extended IOR is lower at $374 billion, the average goods trade is $201.4 billion and average for services trade is $57.6 billion.

Table 3: Aggregates (US$ billion) of Core IOR member states (2023)

Country	GDP US$ bil	Goods Trade	Services Trade	G & S trade	Net FDI	Net FDI outflows	Net FDI inflows
India	3568	1104	395.3	1499	-14.2	13.9	28.1
Australia	1728	659	197.3	856	-22.0	13.3	35.3
Indonesia	1371	481	73.9	555	-14.4	7.1	21.5
Saudi Arabia	1068	527	110.0	637	-5.5	17.3	22.8
Thailand	515	574	104.4	679	3.4	13.7	10.3
United Arab Emirates	514	954	208.6	1163	-8.4	22.3	30.7
Singapore	501	900	515.8	1415	-93.5	38.9	132.5
Bangladesh	437	123	16.2	139	-1.4	0.0	1.4
Iran	405	163	15.9	179	0.0	0.1	1.4
Malaysia	400	579	86.5	665	0.0	8.0	7.9
South Africa	381	242	42.1	284	-6.7	-2.8	3.9
Qatar	213	128	49.7	178	0.3	-0.2	-0.5
Kuwait	164	121	26.6	148	9.1	11.2	2.1
Oman	109	99	13.8	113	-12.7	-0.2	12.5
Kenya	108	25.8	11.8	37.5	-0.2	0.3	0.5
Sri Lanka	84.4	28.7	10.2	38.9	-0.7	0.1	0.7
Tanzania	79.1	21.0	7.2	28.2	-1.6	0.0	1.6
Bahrain	46.1	40.2	20.2	60.4	-6.1	1.1	7.2
Mozambique	21.0	18.4	5.0	23.4	-2.5	0.2	2.7
Madagascar	15.8	8.0	3.1	11.1	0.0	0.1	0.4
Mauritius	14.6	8.6	11.5	20.1	-1.8	0.0	0.8
Maldives	6.6	3.9	5.2	9.1	-0.8	0.0	0.8
Seychelles	2.1	2.0	3.1	5.0	-0.3	0.0	0.2
Comoros	1.4	0.4	0.8	1.2	0.0	0.0	0.0
Avg of Core IOR	489.7	283.8	80.6	364.3	-7.5	6.0	13.5
Sum Total	11752	6810	1934	8744	-180	144	325
World share	11.1%	14.1%	13%	14%		13%	33%
Note: Net FDI= Net FDI outflows- Net FDI inflows							
Source: Authors' calculation using World Development Indicators database							

Note: Net FDI= Net FDI outflows- Net FDI inflows
Source: Authors' calculation using World Development Indicators database

Figure 3 gives a visual representation of trade in goods and services index from India perspective and foreign perspective. The green trend line gives an average of countries economically important to India within the IOR. Countries on or above the trend line are relatively important to India. These countries are Saudi Arabia, Indonesia, Australia, Malaysia, Thailand, Qatar, South Africa and Bangladesh. The 45 degree red line for (TGSIi, TGSIf) = (0 to 7, 0 to 7) portrays that UAE and Singapore are more important India than India is to them in goods and services trade. These countries are especially important for India as a lot of FDI comes from these countries. In fact, Singapore is the second largest source of FDI into India. The FDIIi values of 27 and 8.9 corroborate this claim. A lot of FDI also flows into India from Mauritius, the country is not the originating source of these inflows.

Table 4: Aggregates of Extended IOR member states

Country	GDP US$ bil	Goods Trade	Services Trade	G & S trade	Net FDI	Net FDI outflows	Net FDI inflows
Myanmar	66.8	31.2	5.3	36	0.0	0.0	1.5
Zambia	27.6	20.6	2.5	23	-0.5	0.2	0.6
Lesotho	2.1	2.5	0.3	3	0.0	0.0	0.0
Botswana	19.4	12.3	2.0	14	-0.7	0.0	0.7
Malawi	12.7	4.1	3.9	8	-0.1	0.1	0.2
Eritrea		1.0	0.9	2	0.0	0.0	0.0
Namibia	12.4	12.7	5.7	18	0.0	0.0	2.3
Uganda	48.8	18.3	4.5	23	-3.0	0.0	3.0
Egypt	396.0	125.3	52.3	178	-9.5	0.4	9.8
Somalia	11.0	4.9	3.6	9	0.0	0.0	0.7
Yemen		5.3	1.9	7	0.0	0.0	0.0
Avg of Extended IOR	374.2	201.4	57.6	259.0	-5.5	4.1	9.8
Avg (Extended-Core) IOR	66.3	21.7	7.5	29.2	-1.3	0.1	1.7
World share of Extended IOR	11.6%	14.6%	13.4%	14.3%		13.3%	34.8%
World share of (Extended-Core) IOR	0.6%	0.5%	0.6%	0.5%	-0.2%	0.4%	2.8%
Note: Net FDI= Net FDI outflows- Net FDI inflows							
Source: Authors' calculation using World Development Indicators database							

Note: Net FDI= Net FDI outflows- Net FDI inflows.
Source: Authors' calculation using World Development Indicators database

Figure 3: TGSI - Indian (TGSIi) vs foreign partner's (TGSIf) perspective (Core IOR)

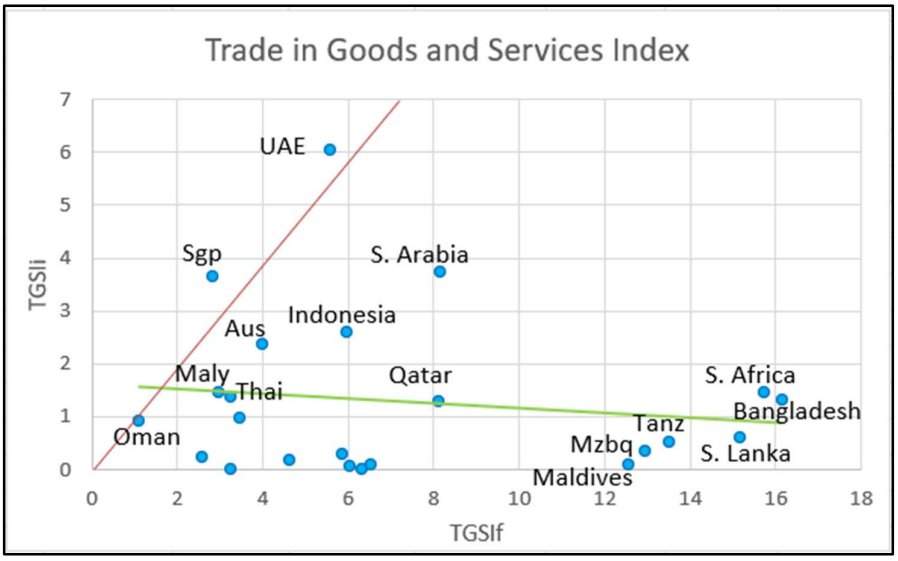


Table 5 presents the bilateral trade goods and services index between India and its IOR partner countries. The importance India places on its IOR partners in terms of trade in goods and services is much less than the importance placed by its partner countries in India. This is evident by comparing the TGSIi and TGSIf values. Except for UAE and Singapore, TGSIi<TGSIf for all the countries. The higher TGSI ranking for these two countries compared to their TGSIf

ranking is in fact driven by the fact that their TGSIi values are higher. The difference in rankings is highlighted in light red colour.

Table 5: Indices of Goods & Services Trade, Human Connectivity and FDI

Partner Country	TGSI		TGSIi	TGSIf		HCI		HCI-TGSIf	FDIIi
	Value	Rank		Value	Rank	Value	Rank		
Core IOR									
Bangladesh	8.7	1	1.3	16.2	1	2.9	15	-13.3	0.2
South Africa	8.6	2	1.4	15.7	2	1.6	18	-14.2	0.1
Sri Lanka	7.9	3	0.6	15.2	3	18.1	7	2.9	0.2
Tanzania	7.0	4	0.5	13.5	4	5.9	13	-7.6	0.0
Mozambique	6.7	5	0.4	13.0	5	1.2	19	-11.7	0.3
Maldives	6.3	6	0.1	12.6	6	16.9	10	4.3	0.0
Saudi Arabia	5.9	7	3.7	8.2	7	18.0	8	9.8	0.3
UAE	5.8	8	**6.0**	**5.6**	14	40.2	2	34.6	**8.9**
Qatar	4.7	9	1.3	8.1	8	32.3	5	24.2	0.1
Indonesia	4.3	10	2.6	6.0	12	2.4	16	-3.6	0.7
Mauritius	3.3	11	0.1	6.5	9	17.8	9	11.3	**9.6**
Singapore	3.2	12	**3.6**	**2.8**	21	9.0	12	6.1	**27.0**
Australia	3.2	13	2.4	4.0	16	10.0	11	6.0	0.1
Comoros	3.2	14	0.0	6.3	10	0.0	21	-6.3	0.0
Kenya	3.1	15	0.3	5.9	13		23	-5.9	0.0
Madagascar	3.0	16	0.1	6.0	11	1.9	17	-4.1	0.0
Bahrain	2.4	17	0.2	4.6	15	34.0	3	29.4	0.0
Thailand	2.3	18	1.4	3.2	19	0.9	20	-2.4	0.1
Kuwait	2.2	19	1.0	3.5	17	33.5	4	30.0	0.2
Malaysia	2.2	20	1.4	3.0	20	4.5	14	1.6	0.1
Seychelles	1.6	21	0.0	3.3	18	31.3	6	28.0	0.0
Iran	1.4	22	0.2	2.6	22	0.0	22	-2.6	0.0
Oman	1.0	23	0.9	1.1	23	47.7	1	46.6	0.1
Peripheral IOR									
Yemen	5.7	1	0.1	11.3	11		11	-11.3	0.0
Botswana	4.9	2	0.1	9.7	4	6.2	4	-3.5	0.0
Somalia	4.8	3	0.1	9.6	10	0.0	10	-9.6	0.0
Malawi	4.5	4	0.0	9.0	5	3.2	5	-5.8	0.0
Uganda	3.7	5	0.1	7.3	8	0.7	8	-6.6	0.0
Zambia	3.7	6	0.0	7.3	3	9.0	2	1.7	0.0
Egypt	2.6	7	0.6	4.5	9	0.5	9	-4.0	0.0
Myanmar	2.3	8	0.1	4.5	2	19.4	1	14.9	0.0
Namibia	2.0	9	0.1	3.9	7	0.8	7	-3.0	0.0
Eritrea	1.3	10	0.0	2.7	6	1.5	6	-1.2	0.0
Lesotho	0.6	11	0.0	1.1	1	7 .8	3	6.7	0.0

Note: Green colour indicates low TGSI rank but high HCI rank. Light red colour indicates high TGSI rank but much lower TGSIf rank

Source: Authors' calculation

It is interesting to note that although Oman, Bahrain, Kuwait and Seychelles are highly connected to India at people level (HCI>30), the economic connectivity-measured by trade-between India and these countries remain low. Oman is one country that is ranked the last in TGSI and TGSIf and first in HCI. India can leverage its Pravasi connections with Oman, Bahrain, Kuwait and Seychelles to strengthen its economic ties. The same can be done for

bringing UAE and Qatar to higher ranks where the difference between their HCI and TGSIf is more than 30. Figure 4 presents the relation between TGSIf and HCI for Core IOR. For all the countries lying above the green trend line, HCI connections with these countries can be leveraged for deepening economic ties with India. Ten countries lie above the trend line while the remaining 13 countries lie below it.

Figure 4: Human Connectivity & Trade(G&S) Index-foreign perspective (Core IOR)

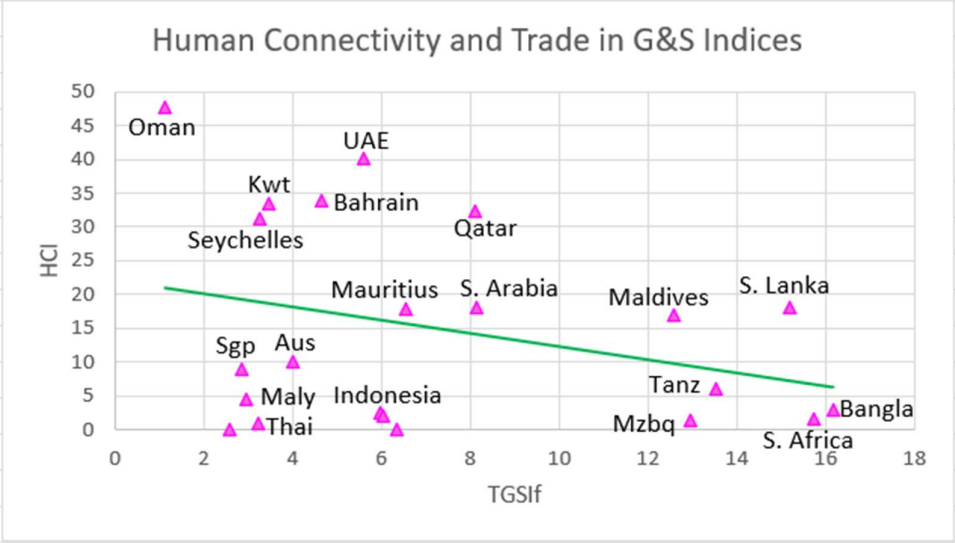


Table 6 dives deeper into the goods and services index by disaggregating it into two parts: Trade in goods index and trade in services index. These two indices are highly correlated when South Africa is not included in the group of countries, as seen in figure 5. The only outliers in this group are Maldives and Comoros.

Table 6 further sheds light on the importance of foreign country (in Core IOR) to India in goods trade compared to services trade (measured by TGIi- TSIi) and the importance of India to foreign country in goods trade compared to services trade (measured by TGIf-TSIf). Column 4 clearly depicts that all IOR countries except five are important to India more in goods trade than in services trade. Bahrain, Mauritius, Maldives and Australia is slightly more important in India's services trade (TGIi-TSIi < -1) but Singapore's share in India's total services trade is relatively much higher with (TGIi-TSIi) = -2.8. This is explained by the significant amount- more than 1000 million USD- of trade in professional and management services, transport (mainly sea transport), telecommunications, computers and information services.

Figure 5: Composite Trade Indices - Goods vs Services (Core IOR ex South Africa)

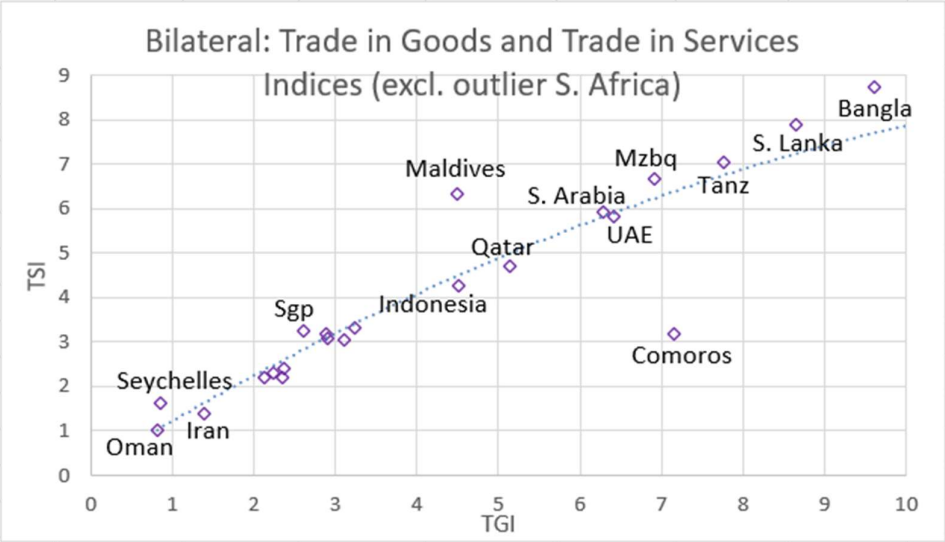


Table 6: Trade in Goods/Services Indices, from Indian & foreign partner perspective

India's Partner	TGI	TGIi	TGIf	TSI	TSIi	TSIf	TGIi-TSIi	TGIf-TSIf
Oman	0.8	1.1	0.5	2.8	0.2	5.5	0.9	-5.0
UAE	6.4	7.1	5.7	3.8	2.5	5.1	4.6	0.6
Bahrain	2.4	0.2	4.6	2.5	0.2	4.8	-0.1	-0.2
Kuwait	2.1	1.1	3.2	3.0	0.4	5.6	0.7	-2.4
Qatar	5.1	1.4	8.9	2.3	0.5	4.1	0.9	4.8
Seychelles	0.9	0.0	1.7	2.4	0.0	4.7	0.0	-3.0
Sri Lanka	8.7	0.8	16.5	4.4	0.2	8.6	0.6	7.9
Saudi Arabia	6.3	4.3	8.3	3.0	1.3	4.7	3.0	3.6
Mauritius	3.2	0.1	6.4	3.2	0.2	6.2	-0.1	0.2
Maldives	4.5	0.1	8.9	5.6	0.2	11.0	-0.1	-2.1
Australia	2.9	2.2	3.5	4.5	2.7	6.2	-0.5	-2.7
Singapore	2.6	3.0	2.2	4.9	5.8	4.0	-2.8	-1.8
Tanzania	7.8	0.6	14.9	5.3	0.2	10.3	0.5	4.6
Malaysia	2.4	1.7	3.0	1.6	0.5	2.7	1.2	0.3
Bangladesh	9.6	1.7	17.5	5.5	0.5	10.5	1.2	7.0
Indonesia	4.5	3.0	6.0	3.2	0.9	5.4	2.1	0.5
Madagascar	3.1	0.1	6.2	2.7	0.0	5.3	0.0	0.8
South Africa	19.4	1.7	37.2	3.6	0.7	6.4	1.0	30.8
Mozambique	6.9	0.4	13.4	4.5	0.1	8.9	0.3	4.5
Thailand	2.2	1.4	3.0	2.9	1.1	4.6	0.3	-1.6
Comoros	7.1	0.0	14.3	3.4	0.0	6.9	0.0	7.4
Iran	1.4	0.2	2.5	2.3	0.2	4.5	0.1	-2.0
Kenya	2.9	0.3	5.5	3.2	0.2	6.2	0.1	-0.7

Source: Authors' calculations based on WDI data

A comparison of TGIf and TSIf reveals that Oman, Kuwait, Seychelles, Thailand and Iran see more economic value in services trade with India than goods trade with India. This negative (TGIf-TSIf) gap can be explained by the significant outbound tourism to these countries from

India and the associated expenditures. In this context, India could strive to promote tourism to India under the 'Incredible India' campaign for attracting tourists from these countries, especially those with a large Indian diaspora and those countries that have historical connections with India. Another service that contributes to the high TSIf of these countries and of Bahrain, is Transport- including air, sea and other modes of transport. Kenya imported $185.62 million worth of professional management and consulting services from India in 2022.

For India, UAE and Saudi Arabia are much more important in goods trade than in services trade. This is likely due to the significant quantity of oil imported from these two countries.

In the goods sector, South Africa, Bangladesh, Sri Lanka, Comoros, Tanzania and Mozambique place much higher importance to trade in goods with India than India places in these countries. The difference between TGIi and TGIf for these countries are more than -10. A variety of goods are traded between India and these countries. For example, India imports precious stones, coal and ores from South Africa and exports pharmaceuticals, petroleum and machinery. With Tanzania and Mozambique as well, India has a similar goods trade with gold and textiles being additional items. In the services sector, all countries in Core IOR, the value of TSIf is greater than the value of TSIi, except Singapore. Maldives, Tanzania and Bangladesh have the largest differences of 10 or more. Singapore is the only country in IOR that is economically more important to India in both, goods and services trade, than is India to Singapore.

6.2 Foreign Investment (FDI)

With respect to foreign direct investment (FDI) (Table 3), it is interesting to note that Singapore receives the largest absolute amount of net FDI inflows and records the largest net FDI outflows among Core IOR economies, followed by Australia, the UAE, Saudi Arabia, India, and Indonesia (USD billion, Table 3). In 2023, Singapore alone accounted for 13.4[12] per cent of global net FDI inflows, underscoring the central role played by a single IOR economy in global capital flows.

Some of the key factors explaining these large net FDI inflows into Singapore include the following. First, Singapore's strategic location in Southeast Asia, combined with world-class infrastructure—particularly in ports, airports, and logistics connectivity—has positioned it as a natural regional hub for managing and deploying capital across Asia. Firms frequently use Singapore as a hub-and-spoke base from which investments are channelled into ASEAN, South Asia, and beyond. Second, Singapore offers a high degree of political stability, strong rule of law, and investor protection, which significantly boosts investor confidence. Its common-law legal framework, transparent regulatory environment, and strong governance structures reduce investment risk for multinational corporations. Third, Singapore's investor-friendly tax regime, with one of the lowest corporate tax rates globally (around 17 per cent), further enhances its attractiveness. In addition, targeted tax incentives for investment, research and development, and innovation improve after-tax returns for investors. Finally, Singapore's position as a global financial hub enables it to attract international capital and skilled talent, reinforcing its role as a key conduit for cross-border investment flows.

[12] Authors' calculation

Singapore's experience highlights the potential gains for other IOR economies from closer collaboration in trade and investment. Investment agreements, in particular, have played an important role in facilitating capital flows. The Double Taxation Avoidance Agreement (DTAA) has been a major driver of India–Singapore investment flows, illustrating how such arrangements can effectively channel FDI. While Singapore does not rely solely on exclusive bilateral investment agreements, its free trade agreements (FTAs) with partners such as the EU, China, India, and Japan often include investment protection and facilitation provisions that deepen market access and provide regulatory certainty to foreign firms. With Singapore being an integral part of the IOR, these trade and investment frameworks can also benefit other IOR economies by enabling FDI flows from the Rest of the World (ROW) into the region, as well as supporting intra-IOR investment.

The Mauritius–Singapore Bilateral Investment Treaty (BIT) further illustrates this channel. Designed to promote bilateral capital flows, the BIT provides guarantees related to non-discriminatory treatment, protection against expropriation, and free transfer of funds. By ensuring legal certainty, investor security, and free repatriation of profits, the agreement strengthens investor confidence. Mauritius serves as a gateway for investment into Africa, while Singapore provides access to Asia.

Overall, the evidence suggests that well-designed investment agreements—either as standalone treaties or as part of broader FTAs—can play a critical role in attracting FDI into the IOR, both from within the region and from the Rest of the World.

6.3 Strengths and Weaknesses in Bilateral Trade

The previous section examined the connection between India and its partner countries in trade in goods, trade in services and trade in goods & services. To understand the asymmetry in the strength and weaknesses of these connections-given the existing economic agreements, this section uses a matrix of TGSIi and TGSIf.

Table 7: Core IOR: Trade in Goods and Services Indices Matrix

	CORE IOR	TGSI- Foreign perspective		
		High (>=10)	**Medium: (>=4 & <10)**	**Low (>1 & <4)**
TGSI- India perspective	**High (>5)**		UAE	
	Medium (>=1 &<5)	South Africa Bangladesh	Saudi Arabia Indonesia Australia Qatar	Singapore Malaysia Thailand Kuwait
	Low (<1)	Sri Lanka Tanzania Maldives Mozambique	Kenya Bahrain Madagascar Comoros Mauritius	Oman Iran Seychelles

Table 7 presents this matrix of TGSI from Indian and foreign perspective for the Core IOR. The countries are divided into three categories. These are High (TGSIf≥10), Medium

(4≤TGSIf<10) and Low (1<TGSIf<4) from a foreign perspective. From India's perspective the categories are High (TGSIi>5), Medium (1≤TGSIi≤5) and Low (TGSIi<1).

The analysis of the matrix reveals that 7 out of 23 countries' connections with India is symmetric while for others it is asymmetric. These countries are listed in the symmetric blue-coloured boxes- (High, High), (Medium, Medium) and (Low, Low). Countries in boxes with same colours (apart from blue) represent asymmetric connections and thereby asymmetric efforts in improving economic connections between the two countries.

Start with symmetrical connections, Saudi Arabia, Indonesia, Australia and Qatar lie in the (Medium, Medium) category. All these countries have strong connections with India and vice versa in goods and services trade. Saudi Arabia for example, is a major source (in Core IOR) of crude oil exports for India. While India does not have a formal FTA with Saudi Arabia, India is actively negotiating a comprehensive FTA with GCC, which includes Saudi Arabia as a member state. In 2025, the two countries signed strategic MoUs worth $100 billion covering energy (including green hydrogen and solar), infrastructure, manufacturing, technology, defense, and cultural exchange. The two countries have also signed agreements to facilitate travel for Indian Haj pilgrims through a Bilateral Agreement for Indian Haj pilgrims for 2025. Similar kinds of initiative in the tourism sector can be adapted by other IOR countries as well for deeper economic integration.

The India-Australia (Economic Cooperation & Trade Agreement) came into implementation in 2022. Post the implementation of these agreements, the bilateral merchandise trade has increased substantially surging from $12.2 billion in 2020-21 to $26 billio2 in 2022-23. The Ind-Aus ECTA was officially implemented on Dec 29, 2022

Indonesia is the only ASEAN country in IOR that lies in the (Medium, Medium) category. Eight percent of Indonesia's total goods exports and 3.9 percent of its goods imports were to and from India in 2022. Indonesia's services exports and imports with India were also more than 5 percent. If the India-ASEAN FTA is revised to include tariff reduction in services, the trade between the two countries can further enhance and deepen economic ties. While ASEAN nations mainly benefit from goods trade, introduction of services in economic agreements will increase economic gains for India as well.

India and Qatar have an economic partnership. The two countries aim to double their trade to $28 billion in the next 5 years and are presently exploring an FTA to enhance bilateral trade and investment. This is expected to move Qatar up to (Medium, High) category.

All these efforts by India and its partner countries to strengthen their trade relations are expected to move these countries diagonally upwards in the matrix to the categories of (High, High). An Indian Ocean Community or an Indian Ocean FTA that this paper proposes, will act as a catalyst.

Oman, Iran and Seychelles lie in the (Low, Low) category. The negotiations for an FTA between India and Oman are already complete and a deal will be finalized by the end of 2025. The implementation of this free trade agreement will lead to increased market access for businesses and an increase in foreign direct investment. This will move Oman upwards to the (Medium, Medium) category from the current (Low, Low) category. Further efforts must be made from the Indian side to attract tourists from Oman, supported by Oman. Seychelles- an island nation

in IOR- has a high human connectivity with India. Leveraging this connection, India could expand its trade and tourism with Seychelles.

In the case of asymmetry in trade in goods and services, UAE falls in the (High, Medium) category. This position can be attributed to the India-UAE Comprehensive Economic Partnership Agreement (CEPA) that came into effect on May 1, 2022. One year post the CEPA's implementation, the bilateral trade between India and UAE has surged 14.7% to $83.64 billion in 2023-24. Although the two countries are gaining from bilateral trade, India should aim to attract UAE tourists. In 2022, around 42 percent of Indian tourists visited UAE that constituted 50 percent of the total foreign tourist arrivals to UAE. However, close to zero percent of tourist arrivals to India were from UAE.

Singapore, Malaysia and Thailand- all ASEAN- lie in the (Medium, Low) category. From India's perspective, Singapore is the most important amongst the three, with TGSIi for Singapore (3.6) being more than double the TGSIi for Malaysia and Thailand (1.4). The existing India-Singapore Comprehensive Economic Cooperation Agreement (CECA) has supported the economic connectivity between the two nations. The implementation of CECA has led to substantial growth in bilateral trade, rising from USD 6.7 billion in 2004-05 to USD 35.6 billion in 2022-23 (Ministry of Commerce & Industry (as cited in Ministry of External Affairs, Sep 2024)). However, India's importance in trade and services sector remains low for Singapore. In fact, the order of economic importance reverses when looked at from foreign country's perspective- Thailand (3.2), Malaysia (3) and Singapore (2.8). Singapore is also India's second largest source of FDI with the cumulative equity FDI from Singapore crossing USD 171 billion. Less than 2 percent (1.89) of foreign tourist arrivals to India are from Singapore and 0.07 percent of outbound tourism from Singapore is to India. Singapore should support India is its efforts to promote tourism in India. This can be done through the formulation of new tourism agreements between the countries.

The share of Malaysia in India's goods trade basket was 2 percent in 2022 while the share of India in Malaysia's goods trade basket was in the range of 2.4 and 3.5 percent. Malaysia exported more to India than imported from it. India's trade in services with Malaysia was less than 1 percent. The lack of 'reduction in tariff on services' was most certainly the reason behind this very small share. Further, within travel services, less than 2 percent of Malaysian tourists travelled to India in 2022 however Indian tourists made up 3 percent of Malysia's total tourists that year. Clearly, more emphasis should be put on improving inbound and outbound tourism.

For Thailand- a member of the ASEAN and BIMSTEC- less than one percent of Indian tourists visited Thailand and vice-versa. This is less than the corresponding figures of Malaysia and Indonesia, who are members of the ASEAN. As far as trade is concerned, 4.6 percent of Thailand's services trade was with India- both exports and imports, mainly owing to the influx of tourists from India every year.

Kuwait finds itself placed in the (Medium, Low) category owing to the negligible share of partner country's goods exports in their total exports and significantly low proportion of foreign tourist arrivals to India from Kuwait.

South Africa, a member of the BRICS nations has the largest reserves of manganese and platinum group metals (Ashcroft, 2024; 360 Mozambique, 2023; Al Jazeera Staff, 2022) in the world. Though India finds South Africa as a country with Medium economic connectivity with

India, South Africa's abundant reserves of manganese and platinum group metals (Ashcroft, 2024; 360 Mozambique, 2023; Al Jazeera Staff, 2022) can help establish an Energy and Mineral Community in the IOR. This community can be joined by Tanzania, a major producer of gold and rare tanzanite gemstone (Ashcroft, 2024). Tanzania has highly asymmetrical economic connections with India, with it being less important to India than is India to Tanzania. Tanzania lies in the (Low, High) category.

Sri Lanka, another member of the BIMSTEC, lies in the (Low, High) category. As of June 2025, a full operational BIMSTEC FTA is not operational, but a free trade agreement exists between India and Sri Lanka. This is the ISLFTA that has been operational since 2000. However, due to reservations expressed by the Sri-Lankan government- reported by a senior commerce department official[13], a CEPA has not been signed; this may hinder enhancement in investment, trade in services and economic cooperation.

Mauritius, Madagascar and Mozambique are Indian Ocean Island nations which have a very low trade importance from India's perspective, but place India in either High or Low category from their own perspective. The India-Mauritius Comprehensive Economic Cooperation and Partnership Agreement (CECPA) came into effect on April 1, 2021. This agreement has probably contributed to the relatively higher TGSIf of Mauritius in relation to India's TGSIi. On the trade front, a mere 0.21% of Indian tourists traveled to Mauritius, and 0.35% of foreign tourist arrivals to India were from Mauritius.

Madagascar and Mozambique, apart from being net exporters of metallic mineral ores and concentrates in the world, are strategically important. Madagascar's location in the Mozambique channel and its proximity to major shipping lanes makes it a key geopolitical area. Mozambique's long coastline bordering the Mozambique Channel and its access to the Indian Ocean also contributes to its strategic significance (Nehra, 2021). Although these nations consider India an important trade partner (basis TGSI), India should aim to engage in more trade with these countries to reach the (Medium, High) or (Medium, Low) categories. As both the nations are rich in metallic mineral resources, these nations offer mineral exploration and processing opportunities for Indian mining and processing industries.

7. Logistics: Shipping Connectivity

Maritime shipping connectivity between countries plays a crucial role in global trade, economic development and regional integration. According to UNCTAD's Review of Maritime Report, 2023, maritime shipping handles 80 percent of global trade by volume. This makes connectivity essential for importing and exporting goods (esp. heavy goods). Well-connected ports offer lower freight costs and transit times, thereby boosting trade competitiveness. Maritime connectivity within regions also provides the benefit of supporting local supply chains that enables even smaller economies to participate in global markets.

Organizations like the Indian Ocean Commission (IOC)- a 5-member organization- is committed to a policy to enhance their intra-regional trade by improving their maritime connectivity among improving air and digital connectivity (Mohabeer, 2020). The BIMSTEC Coastal Shipping Agreement proposed by India and the increased transport connectivity clause under BIMSTEC are other examples of such initiatives. India's Sagarmala Programme (2015)

[13] Sri Lanka not keen on CEPA with India

discussed by PM Modi at the Maritime India Summit 2016 also includes maritime connectivity as one of its salient features.

Liner Connectivity plays an important role in determining a nation's ability to gain access to global markets (Mohamad et al., 2015). The Liner Shipping Connectivity Index (LSCI) is a widely used measure for assessing how integrated a country is within global trade networks, offering key insights into the efficiency and accessibility of global maritime trade routes. (Mohamad et al., 2015; UNCTAD). The UNCTAD's Liner Shipping Bilateral Connectivity Index (LSBCI) gives the same comprehensive measure of maritime connectivity, but between two partner countries.

The LSBCI scores are comprised of 5 key components. These are:

"1. Transshipment Requirements- it measures the number of transshipments needed to move goods from country X to Country Y.
2. Direct Connections: Evaluates the number of direct shipping routes shared between the two countries.
3. Indirect connections with One-Transshipment: Counts the number of common connections with one transshipment between the country pair.
4. Service Competition: Analyzes the competition level among services that like country X and Country Y, with higher competition often leading to more efficient and cost-effective options.
5. Ship size on weakest route: Considers the size of the largest vessel operating on the least connected route between Country X and Country Y, indicating capacity limitations."

The LSBCI scores range from 0 to 1, with 1 indicating maximum liner shipping bilateral connectivity.

Using the concept of graph theory, we use the LSBCI scores to calculate the weighted density and average edge weight of these connections within IOR-defined in this paper and within the Indian Ocean Rim Association (IORA). These measures are then contrasted with the average edge weights of other regions such as the EU, ASEAN and North America.

The weighted density is calculated as follows:

$$\text{Weighted Density} = \frac{Sum\ of\ LSBCI\ score}{Max\ possible\ score * Max\ edges}$$

Where max. possible score is 1 and edges are the number of connections between countries. For example, if there are 6 countries, the maximum number of connections or edges would be (6*5)/2. The numerator (6*5) will give us the bilateral connection of 6 countries with the other 5 countries. The product is divided by 2 to account for double counting.

$$\text{Average Edge weight} = \frac{Sum\ of\ LSBCI\ scores}{m}$$

Where m is defined as the maximum number of edges.

We use the Q1 2021 LSBCI scores to calculate the weighted density of the regions concerned. The weighted density of Core IOR is 0.25. This shows that the network is 25% of its maximum strength, even though it is 100% connected in terms of edges. For Extended IOR and IORA this number is 0.23 and 0.25, respectively, a negligible difference from Core IOR weighted density. The value of average edge weight is the same as weighted density.

Compared to IOR's weighted density of 0.25 (core) and 0.23 (extended), the strength of shipping connectivity in the European Union, ASEAN and North America is 0.24, 0.29 and 0.37 respectively. While the EU's shipping connectivity is almost same as that of IOR, North America fares quite well compared to IOR.

To encourage further connectivity in the Indian Ocean Region, India could initiate a dedicated shipping service in the region, offering partnerships to member countries. Alternately, targeted subsidies for shipping, joint investment in maritime infrastructure like ports and ships in IOR countries could serve as incentive for smaller economies to actively engage in regional economic integration with IOR nations. Existing gaps in port infrastructure and arduous customs procedures are some challenges that need to be addressed for promoting regional economic integration in the IOR (Wignaraja et al., 2019). Coastal shipping in the Bay of Bengal is already emerging as a key focus area for regional cooperation. India, Myanmar, and Singapore are actively engaged in discussions to enhance maritime connectivity, while Thailand is exploring the integration of its Ranong port with shipping networks linking Myanmar, Bangladesh, and India (Chaudhury et al., 2019). India's Sagarmala Programme aims to reduce logistics costs and boost trade competitiveness by shifting from infrastructure-heavy transport to efficient coastal and waterway networks. It emphasizes port modernization, industrial growth, job creation, and sustainable coastal development with minimal infrastructure investment. (PIB, 2025, March 27)[14].

8. Minerals, Metals and Oil trade in IOR

The Indian Ocean Region (IOR) is a critical hub for global trade in energy, minerals, and metals supported by its significant natural resource endowments and strategic maritime connectivity. Trade patterns in these sectors are shaped by the distribution of natural resources, trade relations and geographic configuration of demand- both within the IOR and outside. However, despite these complementarities, the intra-regional trade in minerals, metals and crude oil remains less developed (UNCTAD, 2023; World Bank, 2020; ADB, 2022), constrained by tariff and non-tariff barriers, poor port and transport infrastructure, limited infrastructure integration (World Bank, 2021; IORA, 2020), and fragmented regulatory frameworks (UNESCAP, 2022; SAARC Chamber and IORA Joint Report, 2019).

India's dependence on a few nations for the supply of minerals crucial for manufacturing of commercial and defense materials has raised serious concerns in government policies in the past years. (Randive and Jawadand, 2019). A key policy objective is to enhance regional self-reliance and economic interdependence by facilitating greater trade flows in these strategic and critical commodities within the IOR. This would require forming strategic alliances and short- and long-term agreements with nations having abundance of these resources (Randive and Jawadand, 2019), investment in cross-border infrastructure for exploration and exploitation of mineral resources[15] (Randive and Jawadand, 2019), and institutional mechanisms to develop

[14] For details about the Sagarmala Programme, see https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154058&ModuleId=3#:~:text=Introduction,efficient%20coastal%20and%20waterway%20networks.

[15] Indian Oil Company- ONGC Videsh Ltd. has signed diplomatic agreements for securing oil resources in some countries including Columbia, Bangladesh, Brazil, Azerbaijan etc. Japan has similarly signed a trade agreement with India for exploration of rare earth minerals in Indian Ocean (Randive and Jwadand, 2019).

and support supply chain resilience[16]. In this context, we propose the establishment of an **Indian Ocean Energy and Minerals Community (IOEMC)**. Such an agreement would lower or even remove trade barriers, facilitate foreign direct investment, improve market access and promote long-term economic relations between IOR member states. This would lead to deeper regional integration and strengthen strategic regional autonomy in the mineral and energy sectors. This section analyzes the bilateral trade in IOR, IOR's trade with the world and with the rest of the world in the energy and critical metallic minerals sector to make a case for IOEMC.

Table 8 illustrates the aggregate exports, imports, and net imports of IOR member states with other IOR members, with the ROW, and with the world. Four categories of products are examined for this purpose: two in minerals (metallic mineral ores and concentrates; metals and articles thereof) and two in energy (crude oil; refined petroleum). The mineral ores include Aluminium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, niobium, tantalum, vanadium, zircon, precious metals, tin, titanium, tungsten, uranium or thorium, zinc, and "ores and concentrates not elsewhere classified"[17]. The metals and articles include aluminium, copper, iron and steel, iron or steel articles, lead, nickel, tin, zinc, and metals not elsewhere classified; cermets and articles. In the energy space, crude oil and refined petroleum are examined.

The Core IOR exported $9.2 billion worth of metallic mineral ores and concentrates, $48.2 billion worth of metals and articles, $72.2 billion worth of crude oil, and $98.8 billion worth of refined petroleum to Core IOR in 2023. The corresponding figures for imports are $7 billion, $48.7 billion, $100 billion, and $129 billion[18]. It is interesting to note that the core IOR is a net importer of crude oil and refined petroleum within the region but a net exporter of these outside the region.

The proportion of imports from ROW and the proportion of exports to the ROW by Core IOR nations indicate the potential for reorienting trade from the ROW to the Core IOR across all four categories. The key findings are as follows:

Metallic Ores and Concentrates: Currently, 59.2 percent of IOR imports originate from the ROW, while 93.4 percent of exports are directed outside the region, indicating significant scope to regionalize trade through internal sourcing and consumption. IOR in 2023 exported $126.9 billion worth of minerals and imported $10.4 billion worth from ROW.

Metals and Articles: Up to 74.3 percent of current imports from the ROW could be substituted with intra-IOR trade. Moreover, 71.7 percent of exports destined for the ROW could potentially meet internal demand, supplemented by future regional production. In 2023, the IOR exports and imports outside the region were $122.3 billion and $140.4 billion.

[16] China currently holds supremacy in mining, processing and refining of critical minerals in the global supply chains for renewable energy technologies. Beijing's strategic control over these critical minerals have elicited countries such as U.S., Japan, Australia, EU and Canada to introduce policies that diversify and de-risk their supply chains (Jayaram and Ramu, 2024).

[17] India has identified tin, tungsten, niobium, zircon, vanadium, molybdenum, nickel, cobalt and copper as critical minerals included in its list of 30 critical minerals, as reported by the Ministry of Mines (2023, June).

[18] The difference between the Export value and import value exists due to the difference in the valuation method of exports and imports. Exporters report FOB (Free on Board) value that excludes freight/insurance, whereas the importers report CIF (Cost, Insurance, Freight), which includes freight/insurance.

Table 8: Exports to, and Imports from, IOR, from/to World/ROW ($billion, 2023)

	(To/from) Core IOR			(To/from) RoW					(To/from) World		
	Exports to	Imports from	Net imports	Exports to	Imports from	Net imports	Imports: ROW/World (%)	Exports: ROW/World (%)	Exports to	Imports from	Net imports
Metallic mineral Ores and concentrates											
Total	**9.2**	**7.0**	**-2.2**	**126.9**	**10.4**	**-116.5**	**59.2**	**93.4**	**136.1**	**17.4**	**-118.7**
Net Importers			4.9			3.0					5.2
Net Exporters			-7.1			-119.5					-123.9
Metals and articles											
Total	**48.2**	**48.7**	**0.3**	**122.3**	**140.4**	**18.1**	**74.3**	**71.7**	**170.5**	**189.0**	**18.4**
Net Importers			6.9			45.5					49.1
Net Exporters			-6.6			-27.4					-30.7
Crude Oil											
Total	**72.2**	**99.9**	**27.7**	**458.4**	**140.6**	**-317.8**	**58.5**	**86.4**	**530.5**	**240.5**	**-290.0**
Net Importers			91.1			131.6					221.3
Net Exporters			-63.3			-449.3					-511.3
Refined Petroleum											
Total	**98.8**	**129.1**	**30.2**	**219.5**	**93.0**	**-126.5**	**41.9**	**69.0**	**318.4**	**222.0**	**-96.3**
Net Importers			71.4			33.9					89.3
Net Exporters			-41.2			-160.4					-185.6

Source: Authors' calculation using UN COMTRADE data available on WITS

Note: Net exporters is the aggregate value of countries with negative net imports, i.e., these countries export more than they import and Net importers is the aggregate value of countries with positive net imports

Crude Oil: Approximately 58.5 percent of the region's crude oil imports are sourced externally, while 86.4 percent of exports are directed outside the IOR. This suggests considerable opportunity to redirect trade flows within the region. The IOR's exports from and imports to the ROW stood at $458.4 billion and $140.6 billion.

Refined Petroleum: ROW accounts for 42 percent of IOR imports and 69 percent of exports, again highlighting the potential benefits of expanded intra-regional trade.

Overall, the IOR is a net exporter in the world in three resource categories- metallic mineral ores and concentrates, crude oil, and refined petroleum, except for metals and articles.

While table 8 presents the magnitude of the potential to shift trade from outside IOR to within IOR, across all four resource categories, it is important to identify countries that present these opportunities, especially in the short term. Tables 9-12 present the list of selected countries that import a high proportion of their imports from ROW and export a high proportion to ROW.

Bahrain, UAE, Oman, Qatar, Malaysia, India, South Africa, and Australia meet more than 50 percent of their metallic mineral ore demand from outside the region. As for exports, Malaysia, Saudi Arabia, India, Indonesia, South Africa, and Australia export more than 50 percent to ROW. If Australia or South Africa shift a part of their exports to the IOR, the total import demand for mineral ores can be met intra-region, assuming these countries supply the requisite grade qualities of ores and concentrates.

Table 9: Traders to the ROW in Metallic Ores and Concentrates ($ billion, 2023)

Country	(To/From) Core IOR			(To/From) ROW			Opportunity to shift market dd/ss		(To/From) World		
	Exports to	Imports from	Net imports	Exports to	Imports from	Net imports	Imports frm ROW (% of imports frm world)	Exports to ROW (% of exports to world)	Exports to	Imports from	Net imports
Total of Core IOR	**9.2**	**7.0**	**-2.2**	**126.9**	**10.4**	**-116.5**	**59.2**	**93.4**	**136.1**	**17.4**	**-118.7**
of which:											
Bahrain	1.2	0.0	-1.2	0.6	1.6	1.0	100.0	32.9	1.8	1.6	-0.2
UAE	0.0	0.7	0.7	0.0	1.0	1.0	57.1	34.9	0.0	1.7	1.7
Oman	1.0	0.3	-0.7	0.7	1.1	0.4	77.9	39.9	1.7	1.4	-0.3
Malaysia	0.2	1.3	1.0	1.9	1.6	-0.2	56.6	90.0	2.1	2.9	0.8
Saudi Arabia	0.0	0.4	0.4	0.6	0.3	-0.4	37.0	95.7	0.6	0.7	0.0
India	0.2	2.7	2.4	3.6	3.1	-0.5	53.7	94.5	3.8	5.7	2.0
Indonesia	1.2	1.4	0.2	7.5	0.3	-7.2	19.6	86.6	8.6	1.7	-7.0
South Africa	3.2	0.0	-3.2	12.8	0.0	-12.8	76.9	79.9	16.0	0.0	-16.0
Australia	1.8	0.0	-1.7	98.2	0.6	-97.6	96.5	98.2	100.0	0.6	-99.3

Source: Authors' compilation and calculation using UN COMTRADE data available on WITS

It can be further observed that amongst the IOR nations, Australia has the highest exports to the ROW. If only Australia decides to shift its exports from ROW to IOR, that would be sufficient to meet the import demand of the Core IOR.

Within Core IOR, India, UAE Malaysia and Indonesia are major exporters of metals and metal articles. Out of these, India, Malaysia and Indonesia are also major importers of metals and articles. The region's trade with the ROW in 2023 was three times the trade with Core IOR. A significant opportunity exists to shift trade from outside IOR to inside IOR by investing in infrastructure for mineral extraction, metal processing and manufacturing of articles.

Table 10: Traders to ROW in Metals and Articles ($ billion, 2023)

Country	(To/From) Core IOR			(To/From) ROW			Opportunity to shift market dd/ss		(To/From) World		
	Exports to	Imports from	Net imports	Exports to	Imports from	Net imports	Imports frm ROW (% of imports frm world)	Exports to ROW (% of exports to world)	Exports to	Imports from	Net imports
Total of Core IOR	**48.2**	**48.7**	**0.3**	**122.3**	**140.4**	**18.1**	**74.3**	**71.7**	**170.5**	**189.0**	**18.4**
Thailand	3.5	4.3	0.7	9.7	25.3	15.7	85.6	73.2	13.2	29.6	16.4
India	8.9	9.3	0.3	24.1	34.7	10.6	78.9	73.0	33.1	44.0	11.0
Saudi Arabia	2.3	6.0	3.8	3.5	10.7	7.2	64.1	61.1	5.8	16.7	10.9
Singapore	4.4	4.0	-0.4	3.2	8.0	4.8	66.5	42.1	7.7	12.0	4.4
UAE	7.0	4.9	-2.0	11.4	13.4	2.0	73.1	62.1	18.3	18.3	0.0
Kuwait	0.2	1.1	1.0	0.0	1.6	1.6	59.2	21.2	0.2	2.8	2.6
Malaysia	6.0	6.3	0.3	12.6	13.8	1.2	68.6	67.9	18.6	20.1	1.5
Australia	3.8	1.9	-1.8	9.1	9.9	0.8	83.9	70.9	12.9	11.9	-1.0
Oman	2.1	2.3	0.1	1.3	1.6	0.4	41.7	37.1	3.4	3.9	0.5
Qatar	0.9	0.8	-0.2	1.8	2.0	0.3	72.8	65.8	2.7	2.8	0.1
Mozambique	0.5	0.3	-0.2	0.8	0.2	-0.6	39.4	60.5	1.4	0.5	-0.9
Madagascar	0.0	0.1	0.0	0.9	0.2	-0.7	73.8	96.4	0.9	0.3	-0.7
South Africa	0.7	0.7	0.0	4.8	2.3	-2.5	77.4	87.1	5.5	2.9	-2.5
Bahrain	2.2	0.5	-1.8	3.7	0.4	-3.3	49.2	62.9	5.9	0.9	-5.0
Indonesia	5.4	5.2	-0.2	34.9	14.6	-20.3	73.7	86.6	40.3	19.8	-20.5

Source: Authors' compilation and calculation using UN COMTRADE data available on WITS

In the case of Crude oil, it is observed that the UAE doesn't export crude oil to core IOR. This amount can be immediately shifted to the IOR. Of course, the removal of the Asian premium on crude oil will lower costs for the importers and help in the transition. For example, India

meets 99.5% of its crude oil demand from outside the IOR. If costs are reduced, India can meet its import demand from within IOR, especially from the UAE and Saudi Arabia.

Table 11: Traders to the ROW in Crude Oil ($ billion, 2023)

	(To/From) Core IOR			(To/From) ROW			Opportunity to shift market dd/ss		(To/From) World		
Country	Exports to	Imports from	Net imports	Exports to	Imports from	Net imports	Imports frm ROW (% of imports frm world)	Exports to ROW (% of exports to world)	Exports to	Imports from	Net imports
Total of Core IOR	**72.2**	**99.9**	**27.7**	**458.4**	**140.6**	**-317.8**	**58.5**	**86.4**	**530.5**	**240.5**	**-290.0**
of which:											
India	0.0	140.4	140.4	0.0	99.5	99.5	70.9		0	140.4	140.4
Singapore	0.0	27.4	27.4	0.0	12.1	12.1	44.0	77.4	0.0	27.4	27.4
Thailand	0.4	32.2	31.8	0.1	8.4	8.3	26.1	27.9	0.4	32.2	31.8
Indonesia	1.7	11.1	9.4	0.3	8.1	7.8	72.6	16.2	1.7	11.1	9.4
South Africa	0.0	4.8	4.8	0.0	3.8	3.8	78.3	98.5	0.0	4.8	4.8
Malaysia	4.3	10.9	6.6	2.7	2.6	-0.1	19.3	38.7	7.0	13.5	6.5
Australia	4.4	2.4	-2.0	3.2	3.0	-0.2	55.5	42.1	7.7	5.5	-2.2
Malaysia	4.3	10.9	6.6	2.7	2.6	-0.1	19.3	38.7	7.0	13.5	6.5
Australia	4.4	2.4	-2.0	3.2	3.0	-0.2	55.5	42.1	7.7	5.5	-2.2
Qatar	4.3	0.3	-4.0	12.6	0.0	-12.6	8.6	74.6	16.9	0.4	-16.5
Oman	1.5	0.0	-1.5	24.1	1.6	-22.5	100.0	94.1	25.6	1.6	-24.0
Kuwait	6.6	0.0	-6.6	43.2	0.0	-43.2		86.8	49.8	0.0	-49.8
United Arab Emira	0.0	1.3	1.3	162.8	1.4	-161.4	51.5	100.0	162.8	2.7	-160.0
Saudi Arabia*	0.0	621.6	621.6	258.5	-621.6	-880.1		100.0	258.5	0.0	-258.5

Note: The data used for Saudi Arabia is for the year 2022. Kuwait and Saudi Arabia had not reported trade data. So the trade data of partner country was used to calculate FOB/CIF value for Kuwait and Saudi Arabia as reporter countries.

Source: Authors' compilation and calculation using UN COMTRADE data available on WITS

In the trade flow of refined petroleum, UAE and Kuwait, that export a very small amount to IOR and quite a substantial amount to ROW, they can shift their trade flows towards the region in the short term. This shift in export of $100 billion can meet the import demand of Australia, Saudi Arabia, Singapore, Indonesia, Malaysia, Tanzania, Kenya and South Africa (Table 12).

Table 12: Traders to the ROW in Refined Petroleum ($ billion, 2023)

	(To/From) Core IOR			(To/From) ROW			Opportunity to shift market dd/ss		(To/From) World		
Country	Exports to	Imports from	Net imports	Exports to	Imports from	Net imports	Imports frm ROW (% of imports frm world)	Exports to ROW (% of exports to world)	Exports to	Imports from	Net imports
Total of Core IOR	**98.8**	**129.1**	**30.2**	**219.5**	**93.0**	**-126.5**	**41.9**	**69.0**	**318.4**	**222.0**	**-96.3**
of which											
Australia	0.3	16.1	15.8	2.5	19.3	16.9	54.6	88.3	2.8	35.4	32.6
Saudi Arabia	0.0	6.1	6.1	0.0	8.7	8.7	58.6		0.0	14.8	14.8
Singapore	32.1	23.7	-8.4	24.9	29.5	4.6	55.5	43.7	56.9	53.1	-3.8
Indonesia	3.7	17.8	14.1	0.8	2.5	1.8	12.4	17.0	4.4	20.3	15.8
Malaysia	18.3	16.1	-2.3	11.0	12.4	1.4	43.6	37.6	29.4	28.5	-0.9
Tanzania	0.0	2.7	2.7	0.0	0.3	0.2	9.1	98.9	0.0	3.0	3.0
Kenya	0.0	4.1	4.0	0.1	0.2	0.2	5.8	76.3	0.1	4.3	4.2
South Africa	0.3	13.0	12.7	2.6	2.1	-0.5	14.2	89.6	2.9	15.2	12.2
Oman	3.5	6.0	2.5	4.7	1.1	-3.6	15.3	57.7	8.2	7.1	-1.1
Thailand	2.5	3.6	1.2	6.4	0.7	-5.7	16.3	72.3	8.9	4.3	-4.5
Qatar	2.2	0.1	-2.0	6.4	0.0	-6.4	27.4	74.8	8.5	0.1	-8.4
Kuwait	0.1	0.1	0.0	25.1	0.0	-25.0	27.1	99.7	25.2	0.2	-25.0
India	30.8	4.4	-26.4	54.2	7.2	-46.9	62.3	63.7	85.0	11.6	-73.4
UAE	2.7	8.4	5.7	74.2	8.4	-65.9	49.9	96.5	76.9	16.8	-60.1

Source: Authors' compilation and calculation using UN COMTRADE data available on WITS

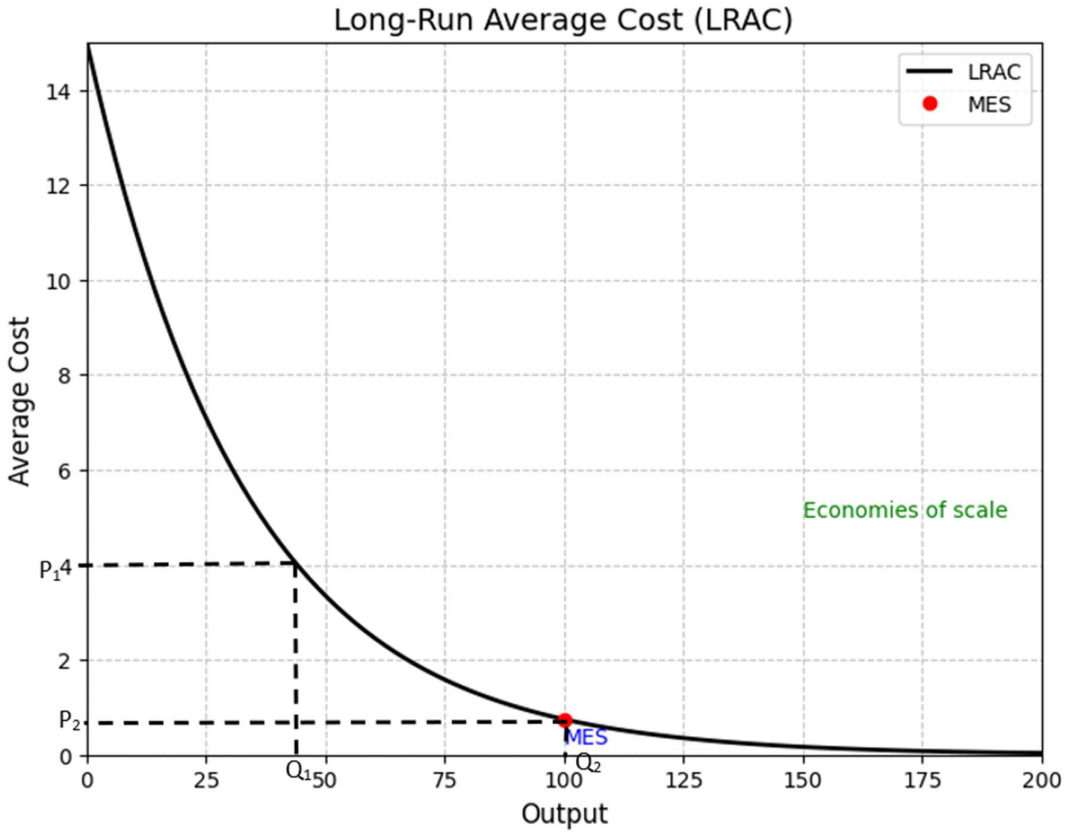
The export surplus in IOR (for minerals, crude oil and refined petroleum), combined with high external dependence on imports, presents a compelling case for promoting regional economic integration under an IOEMC framework. This regional economic integration can be

strengthened by investing in a three-stage process-from mineral extraction to end-use manufacturing. First, mineral ores are extracted through mining. Second, the extracted ores are processed to isolate and refine specific metals. Third, these refined metals are used in the production of various industrial and consumer goods. A similar process applies to crude oil, which is extracted and subsequently refined into petroleum products such as petrol, diesel, kerosene, and aviation fuel.

The expansion of production and processing of resources by establishing industries within the Core IOR can boost regional trade and economic growth for its member states. Collaboration among IOR countries through investment agreements in mineral and energy domains is essential to realize these benefits. The Khalifa Industrial Zone Abu Dhabi (KIZAD), a major hub for metals, petrochemicals, and food processing, is a notable example of creating an export-oriented manufacturing hub. Developing similar hubs across the IOR would shift import demand inward, capitalizing on the region's existing need for metals and manufactured products.

Setting up multiple processing and manufacturing hubs would additionally lead to rapid decline in the average costs of production owing to economies of scale. For example, firms operating below their minimum efficient scale could reduce unit costs by expanding their scale of production. As shown in Figure 6, a firm producing at the Q_1 level of output, incurs a higher unit cost of production (P_1). However, with an increase in the scale of production indicated by Q_2, the average cost falls to P_2. As the firm moves from Q_1 to Q_2, it achieves economies of scale.

Figure 6: Minimum Efficient Scale of Production



Additionally, clustering these facilities would decrease logistics costs, enhancing competitiveness. The IOR nations' geographical proximity supports intra-regional trade by avoiding disruptions at global choke points, which increases fuel costs, delays shipments, and raises crew wages. Regional refineries would further reduce logistics costs, encouraging trade within the IOR.

9. Bilateral Trade Potential: Gravity Model

To evaluate whether India's trade with its Indian Ocean Region (IOR) partners can deepen through greater regional integration, we apply the augmented gravity model of trade. The objective is to assess the potential for increased bilateral trade flows between India and IOR member countries if these economies were to form a trade bloc or a common market.

The gravity model of trade explores the effect of geographical proximity and economic size of countries on two countries' bilateral trade. The original gravity model can be traced to the works of Tinbergen (1962) and Poyhonen (1963) that describe the gravity model equation as

$$Trade_{ij} = A.\frac{Y_i Y_j}{D_{ij}}$$

The dependent variable $Trade_{ij}$ represents the bilateral trade between country i and country j. Y_i and Y_j are the respective GDPs of the two countries. D_{ij} is the geographical distance between them and A is the constant of proportionality.

This paper uses the augmented gravity model to estimate the difference between the actual and estimated trade between India and its partner countries, expanding the sample to include 23 Core IOR countries and 23 non-core IOR countries that were India's top export destinations as of 2022 (as accessed from WITS). The period over which the assessment is done is 2013-2023. This gravity model is augmented by adding variables such as common colonizer, HCI (as calculated in section 9) [19] and year dummies, including the pandemic year dummy- 2020. The year dummies are included to control for time-specific shocks or unobserved factors such as recessions, national events or lockdown (as seen during the pandemic) that affect all entities (countries) in a given year. This year is taken as a control variable to control for the stark changes in the GDP and trade values of all the countries due to the unprecedented global pandemic in 2020. Other variables such as common border and FTA/CEPA between India and its trade partners are also tested as determinants of bilateral trade. These are however found to be insignificant upon empirical estimation. Table 13 presents a list of the variables used for the gravity model analysis.

To estimate the coefficients of the gravity model- a panel dataset of 46 countries and 11 years, the study applies the non-linear method of Poisson-Pseudo Maximum Likelihood (PPML) as suggested by Santos Silva and Tenreyro (2006), mentioned in Lohani (2020). Equation 1 is estimated using the PPML method. All the independent variables are transformed into logarithmic form except for HCI which is an index.

$$Trade_{ijt} = \exp(\beta_1 + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_4 lnDist_{ij} + \beta_5 comcol_{ij} + \beta_6 Pandemicyr_t + \beta_7 HCI_{ij} + \delta_t) + \varepsilon_{ijt} \quad (1)$$

[19] Refer section 4, last paragraph for details on the components of HCI.

Table 13: List of variables used in the Gravity Model

Name of variable	Abbreviation	Measurement	Source of Data
Gross domestic product of India	GDP_i	GDP at current US dollar in billions	WDI
Gross domestic product of partner	GDP_j	GDP at current US dollar in billions	WDI
Bilateral Distance	$dist_{ij}$	Bilateral distance between countries' capital cities	CEPII
Bilateral trade between country i (India) and country j (partner country)	$Trade_{ij}$	Value in millions of dollar	Directorate of Trade and Statistics (DOTS database)
Common colonizer	$comcol_{ij}$	Countries share common historical colonizers	
Human Connectivity Index	HCI	Index	Authors' calculation
Pandemic year (2020)	$Pandemicyr_t$	1 if year is 2020, 0 otherwise	
Common Border	combord	If countries share common border, value is 1 or 0 otherwise	CEPII
Free Trade Agreement	FTA	If India and its partner country have an FTA or CEPA then 1, 0 otherwise	

Table 14: List of Countries used for Gravity model Analysis

Australia	Italy	Seychelles	Togo
Bahrain	Japan	Singapore	Nigeria
Bangladesh	Kenya	South Africa	Mexico
Belgium	Korea	Sri Lanka	Spain
Canada	Kuwait	Tanzania	Russia
China	Madagascar	Thailand	Poland
Comoros	Malaysia	UAE	Philippines
Egypt	Maldives	UK	
France	Mauritius	USA	
Germany	Mozambique	Brazil	
Indonesia	Netherlands	Turkey	
Iran	Oman	Nepal	
Israel	Saudi Arabia	Vietnam	

Where $Trade_{ijt}$ is the bilateral trade between India and its partner country where India is taken as the reporter country. GDP_i reflects the reflects the output and income of India and GDP_j reflects the output and income of India's trade partner. $Dist_{ij}$ is the bilateral distance between India's capital city- New Delhi- and the partner country's capital city. As per the gravity model

of trade, the greater the distance between two countries, smaller the size of bilateral trade. That is, distance is inversely proportional to bilateral trade. Countries having historical ties like a common colonizer can positively affect bilateral trade as history shows migration of many Indians from one British colony to another. $Comcol_{ij}$- a dummy variable- represents the common colonizers of India and its partner countries. HCI is the Human Connectivity Index that has been kept constant across all periods of study for the corresponding importer. The variable $Pandemicyr_t$ is a dummy variable, with the year 2020 accorded a value of 1 and other years accorded a value of 0. δ_t captures the time dummies and ε_{ijt} is the error term.

Equation 2 estimates equation 1 without HCI, noting the difference in magnitude and significance of the coefficients of variables without bringing in the human connections between India and its partner countries. It is estimated as follows:

$$Trade_{ijt} = \exp(\beta_1 + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_4 lnDist_{ij} + \beta_5 comcol_{ij} + \beta_6 Pandemic_{ij}) + \epsilon_{ijt} \quad (2)$$

To determine the role played by pre-existing or recently implemented FTAs or CEPA on bilateral trade, FTA is introduced as a dummy variable, with 1 denoting existence of FTA/CEPA between India and partner countries for the relevant years and 0 otherwise. Sharing of borders can reduce logistics costs between 2 countries. Hence India sharing a common border with its partner countries is also tested as a determinant of bilateral trade. However, the landlockedness of a country hinders trade between countries and hence the landlocked country suffers from a higher cost. As India is not landlocked, the study tests the effect of landlocked-ness of India's partner country on the bilateral trade between the two countries. Equation 3 tests the effect of these additional time-invariant variables on bilateral trade.

$$Trade_{ijt} = \exp(\beta_1 + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_4 lnDist_{ij} + \beta_5 comcol_{ij} + \beta_6 Landlockedness_j + \beta_7 HCI_{ij} + \beta_8 FTA_{ij} + \beta_9 Combord_{ij}) + \epsilon_{ijt} \quad (3)$$

Post the estimation of the coefficients, the difference (residual) between the predicted trade and actual value of trade is calculated for each country to evaluate the potential for trade.[20] As the residual is due mostly to policy barriers to trade (tariffs & NTBs) and logistics costs, the idea is to remove barrier to trade (exports) through an IOR FTA plus improved connectivity and thus increase trade and reduce the residual.

The error terms calculated for each country from 2013-2023 are averaged to get the mean error term for that country across all the years.

9.1 Results of empirical estimation

Table 15 presents the estimated coefficients for equations 1 to 2. Results of equation 3 are presented in Appendix 2 as the psuedo-log likelihood value of estimated equation 3 indicates that equations 1 and 2 are comparatively better models. For both the equations, 1 and 2, all the variables are found to be statistically significant. GDP_i is dropped due to the inclusion of time fixed effects.

[20] Dinda (2014), Jomit (2014), Trung and Thu (2016) and Kumar et al. (2021) have calculated the export/trade potential as the difference between the predicted and the actual export/trade values.

Table 15: Estimates of Augmented Gravity Model using PPML method

Dependent variable:	**Tradeij**	
	Model 1a	Model 1b
Independent variables		
ln(GDPj)	0.66***	0.62***
	(0.043)	-0.037
ln(Distij)	-0.63***	-0.8***
	(0.15)	(0.21)
comcol	0.51**	0.70***
	(0.15)	(0.21)
HCI	0.0241**	
	(0.0078)	
Pandemic yr (2020)	-0.196***	-0.21**
	(0.057)	(0.065)
year_2015	-0.124***	-0.131**
	(0.037)	(0.04)
year_2016	-0.184***	-0.196***
	-0.045	(0.05)
year_2022	0.3***	0.301***
	(0.073)	(0.07)
year_2023	0.213*	0.216*
	(0.095)	(0.096)
constant	10.03***	11.88***
	(1.105)	(1.667)
No. of observations	506	506
R-squared	0.87	0.79
Pseudo log likelihood	-807602	-1004544
Year dummies which are not significant, are not shown in the table. S.E. are in parenthesis ***: p<0.01, **: p<0.05, *: p<0.10		

In Model 1a, a 1% larger GDP of partner country is associated with 0.66% higher bilateral imports and a 1% decrease in bilateral distance is associated with a 0.63% increase in bilateral trade. The estimated coefficient for common colonizer (comcol) is 0.51. This implies that countries with which India shares a common colonizer trade $(\exp(0.51) - 1) \times 100 \approx 38.63\%$ more with each other ceteris paribus. Further, the variable measuring countries human connections with India (HCI) is found to be statistically significant at 5% level of significance. Model 1b estimates that a 1% increase in GDP of partner country is associated with a 0.62% increase in bilateral trade. Sharing a common colonizer increases bilateral trade by about 90.27% (exp(0.70)-1) and a 1% decrease in bilateral distance raises bilateral trade by 0.8%.

Table 16 presents the residuals of the actual bilateral trade and the estimated bilateral trade. Observing the values from the table it is seen that the Core IOR countries- Australia, Bahrain, Bangladesh, Comoros, Iran, Kenya, Kuwait, Madagascar, Maldives, Mauritius, Oman (model 1a), Seychelles, Sri Lanka and Thailand (model 1b) exhibit less actual trade with India than predicted by the model. The reasons for this gap, as mentioned earlier, are mostly due to policy barriers to trade (tariffs and non-tariff barriers) and logistics cost. The formation of an IOR FTA will not only reduce barriers to trade but also improve connectivity thereby increasing bilateral trade between India and other IOR countries. It will also insulate the regional from shocks and disruptions outside the region.

Table 16: Gap between Current and Potential Trade with India

		Model 1a	Model 1b
1	Bangladesh	-10091	-22900
2	Oman	-5955	713
3	Bahrain	-5827	-4181
4	Kuwait	-5239	-851
5	Sri Lanka	-2953	-3826
6	Australia	-2032	-739
7	Maldives	-790	-1075
8	Kenya	-585	-2247
9	Mauritius	-551	-599
10	Seychelles	-530	-444
11	Iran	-199	-3049
12	Madagascar	-161	-297
13	Comoros	-69	-120
14	Tanzania	895	60
15	Thailand	1958	-387
16	Mozambique	2044	1932
17	Malaysia	4142	188
18	South Africa	8357	8159
19	Singapore	9737	7376
20	Indonesia	10044	9282
21	Saudi Arabia	15077	19331
22	UAE	17383	34252
Source: Authors' calculation			

10. Conclusion: An Indian Ocean Common Market

India's economic engagement with its Indian Ocean Region (IOR) trade partners in goods and services reveals a consistent pattern: bilateral Free Trade Agreements (FTAs) and Comprehensive Economic Partnership Agreements (CEPAs) have substantially boosted trade volumes, delivering mutual economic gains.

The **India–Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA)** is a recent example. Since its implementation on 29 December 2022, bilateral merchandise trade has more than doubled—from USD 12.2 billion in 2020–21 to USD 26 billion in 2022–23, before moderating to USD 24 billion in 2023–24. India's exports to Australia alone grew by 14%. Similarly, the **India–UAE CEPA**, implemented on 1 May 2022, delivered a 14% rise in bilateral trade during its first year—from USD 67.5 billion to USD 76.9 billion (PIB, 2023). The agreement also spurred Indian FDI into Dubai, reaching USD 4.1 billion during 2020–2024, aided by trade facilitation measures and regulatory easing (Suneja, 2025).

However, the full potential of such agreements remains untapped. Several existing pacts need recalibration to ensure balanced gains. For instance, the India–ASEAN FTA currently benefits ASEAN nations more in services trade. Given India's comparative advantage in services, negotiating lower or zero tariff barriers in this sector would make the agreement more reciprocal and mutually rewarding.

The asymmetries in bilateral trade between India and the rest of the Core IOR have been identified in section 6.2. Estimates of augmented gravity model identify potential for bilateral trade between India and 13 IOR countries. This potential could be tapped by specifically reducing non-trade barriers.

The Core IOR is a net exporter of mineral ores, crude oil, and refined petroleum products. There is significant untapped potential to redirect a larger share of this trade from extra-regional markets towards intra-IOR flows. Establishing mining and processing industries within the region can accelerate this reorientation, foster regional value chains, and drive industrialization. The IOR's economic diversity also offers complementary advantages:

- Resource-rich countries can provide raw materials and opportunities for extraction and manufacturing.
- Services-rich economies can supply cost-effective business and professional services.
- High-income members can invest in manufacturing hubs and infrastructure in underdeveloped areas.

Harnessing these complementarities would make integration economically beneficial for all members.

From a logistics standpoint, the IOR's shipping connectivity (weighted density = 0.25) is comparable to ASEAN's (0.29). Introducing subsidized (perhaps by India and rich countries in the IOR), dedicated shipping services—jointly operated by India and its partners—could significantly deepen intra-regional trade. Coupled with long-standing people-to-people ties, this would strengthen the foundation for economic integration.

Other regional blocs, such as ASEAN and the EU, demonstrate the tangible benefits of eliminating trade barriers: increased intra-regional trade, enhanced supply chain resilience, and greater bargaining power (for EU) in global negotiations. For the EU, integration has translated into a stronger voice in global trade deals; for the IOR, a similar bloc could deliver regional autonomy in global trade, while enhancing resilience against shocks such as the Russia–Ukraine war.

Recent developments relating to trade, further highlight the need for diversification. Following the prolongation of India–U.S. BTA negotiations, the U.S. imposed a 50% tariff on Indian goods—underscoring the risk of overdependence on a few major markets. Reorienting a significant portion of exports toward IOR partners would mitigate such vulnerabilities. India's Act East and SAGAR (Security and Growth for All in the Region) policies already align with this vision of an IOR-wide trade bloc.

This paper therefore advocates for the creation of an **Gondwana Free Trade Area (GFTA)** or a **Comprehensive Economic Partnership Agreement for the IOR (IOR–CEPA)**. Such an arrangement would not only deepen economic ties across the region but also insulate it from the adverse effects of external geopolitical disruptions, conflicts, and supply chain shocks.

The rationale is reinforced by Akintola et al. (2019), whose Computable General Equilibrium (CGE) modelling demonstrates that regional integration can significantly enhance real GDP and bring investment benefits along with paving the way for a more self-reliant and economically cohesive IOR.

Proposed Timeline for Integration:

1. **By 2030** – Formation of a **Minerals and Energy Community** to build foundational trust and interdependence.
2. **By 2035** – Signing of a **multilateral IOR FTA/CEPA**, coinciding with India's projected transition to an upper-middle-income country (in PPP terms).
3. **By 2045–50** – Formation of an **Indian Ocean Common Market**, aligned with India's transition to a high-income economy.

Suggested Clauses for Governing FTA/CEPA Membership:

1. **Membership Criteria**: Open to geographically relevant nations with political stability and no association with terrorism or violent conflict, in line with Core IOR principles.
2. **Admission of New Members**: Governed by a **double majority vote**, based on both economic size/trade volume and substitutability of goods/services within the region.
3. **Tariff Adjustments**: To be undertaken only with **full consensus** among members, ensuring shared ownership and equal partnership. Phase-in schedules for tariff reductions and regulatory harmonization.
4. **Non-Tariff Barriers**: Gradual elimination of NTBs to facilitate smoother trade flows.
5. **Rules of Origin**: Clear criteria for zero-duty access.
6. **Standardization**: Harmonization of quality standards, regulations, and certifications to reduce barriers to trade.

7. **Indian Ocean Trade Council**: Formation of a permanent secretariat in Delhi or Singapore or any other country chosen with majority vote. This council would also be responsible for development of dispute resolution mechanisms for trade conflicts, if any.

8. **Budget and Resource Requirements**: An institutional budget of $500 million could be set for over 3 years with funding coming from contributions of member states (weighted by GDP). A separate fund of $1.5 billion could be set aside for port modernization and connectivity.

The proposed GTA, or IOR-CEPA, could enable India and its partner countries in the Indian Ocean Region to develop a robust and integrated network encompassing trade in goods and services, investment flows—both physical and digital—and logistics. By facilitating deeper economic integration across the region, the framework is expected to generate manifold gains from trade, including improved market access, enhanced supply-chain efficiency, and stronger cross-border investment linkages. This benefit comes along with insulating the region from uncertainties outside the region.

Appendix 1: Human Connectivity and Trade beyond the IOR

While it is important to understand the human connectivity between foreign country and India, it is essential to measure the economic connectivity between the countries as well to develop new and strengthen existing economic relations. We also discuss the gaps between the HCI and the trade indices.

As discussed in the paper, HCI measures people-to-people connectivity of countries inhabited by the Indian diaspora and the TGI measures the trade in goods connectivity of these countries with India. While these countries may be well connected with India at people level and trade level, the potential for further trade (in both goods and services) and investment should be assessed. To determine this potential, we calculate the HCI—TGIf gap and the HCI-TGSIf gap. A positive gap indicates the potential for increase in trade with India- from the country's perspective. A negative gap indicates that these countries are connected more to India w.r.t. trade compared to their connection at people level.

The TGIf, TSIf and the gaps between HCI and TGIf and HCI and TGSIf are shown **in Table 17**. Out of the 37 listed countries, the Gulf has the highest potential for increasing trade with India. Oman, Bahrain, Kuwait, UAE and Qatar, all have an HCI-TGIf gap of more than 15 and Saudi Arabia has a gap of 10.1 The HCI-TGSIf gap for the same countries are also more than 15, with Saudi Arabia's gap being 9.8. This implies that these countries have not fully exploited the latent economic opportunity present due to the significant proportion of Indian pravasis in these nations.

Within the Indian subcontinent, Maldives and in the Indian Ocean, Seychelles, have the potential to further their trade with India. Seychelles has an HCI-TGIf gap of 30, the second largest gap amongst the 37 countries, whereas Maldives has a gap of 7.6. Maldives, Seychelles and India are already members of the Indian Ocean Rim Association (IORA) that focuses on 'trade and investment facilitation' as one of its priority areas. This association between the 3 nations could be exploited for enhancing trade connectivity for mutual gain on top of the already existing advantage due to their human connectivity with India. Enhancing trade in services other than travel services will further contribute to mutual economic gains.

Table 17: HCI-TCI gap and HCI-TGSI gap for countries with HCI>3

S. No.	Region	Country	HCI	TGIf	TSIf	TGSIf	HCI-TGIf	HCI-TGSIf
1	GCC	Oman	47.7	9.5	5.5	1.1	38.2	46.6
2	GCC	Bahrain	34.0	4.6	4.8	4.6	29.4	29.4
3	GCC	Kuwait	33.5	5.0	5.6	3.5	28.5	30.0
4	GCC	United Arab Emirates	40.2	15.4	5.1	5.6	24.8	34.6
5	GCC	Qatar	32.3	13.4	4.1	8.1	18.9	24.2
6	GCC	Saudi Arabia	18.0	7.9	4.7	8.2	10.1	9.8
7	IO	Seychelles	31.3	1.3	4.7	3.3	30.0	28.0
8	ISC	Maldives	16.9	9.3	11.0	12.6	7.6	4.3
9	ISC	Sri Lanka	18.1	17.4	8.6	15.2	0.6	2.9
10	ISC	Bhutan	50.7	57.5	36.3	54.5	-6.8	-3.8
11	ISC	Nepal	47.4	67.6	25.3	48.0	-20.1	-0.5
12	CW LA&C	Guyana	19.9	0.9	2.1	1.2	19.0	18.7
13	CW LA&C	Suriname	13.7	0.9	3.2	1.3	12.8	12.4
14	CW LA&C	Jamaica	7.4	0.7	1.8	1.2	6.7	6.2
15	CW LA&C	Barbados	4.2	0.4	3.4	2.8	3.8	1.4
16	CW LA&C	Trinidad and Tobago	3.6	1.2	2.2	1.4	2.5	2.3
17	ASEAN	Myanmar	19.4	2.7	6.5	4.5	16.7	14.9
18	ASEAN	Singapore	9.0	5.9	4.0	2.8	3.1	6.1
19	ASEAN	Philippines	3.9	1.2	3.2	1.6	2.7	2.3
20	ASEAN	Malaysia	4.5	2.7	2.7	3.0	1.8	1.6
21	ASEAN	Brunei	3.1	1.5	5.8	2.4	1.6	0.7
22	Oceania	Tonga	12.7	0.2	3.0	2.2	12.5	10.5
23	Oceania	New Zealand	10.0	1.1	2.6	1.5	8.9	8.5
24	Oceania	Fiji	7.3	1.6	3.3	2.3	5.7	5.0
25	Oceania	Australia	10.0	6.4	6.2	4.0	3.6	6.0
26	EU	Ireland	3.1	0.5	1.6	1.2	2.6	2.0
27	Non-EU	United Kingdom	7.2	1.8	3.0	2.3	5.4	5.0
28	N. America	Canada	7.5	0.9	3.2	1.3	6.6	6.3
29	N. America	United States	4.4	2.5	3.9	2.8	1.9	1.5
30	BOT	Bermuda	4.3	0.3	0.7	0.6	3.9	3.6
31	CW Africa	Mauritius	17.8	4.4	6.2	6.5	13.4	11.3
32	CW Africa	Lesotho	7.8	0.5	3.6	1.1	7.3	6.7
33	CW Africa	Zambia	9.0	4.5	6.0	7.3	4.5	1.7
34	CW Africa	Botswana	6.2	5.0	5.5	9.7	1.2	-3.5
35	CW Africa	Malawi	3.2	2.4	12.3	9.0	0.8	-5.8
36	CW Africa	Tanzania	5.9	8.5	10.3	13.5	-2.6	-7.6
37	CW Africa	Sierra Leone	3.5	7.4	7.6	7.5	-4.0	-4.0
Note: ISC is Indian Subcontinent, IO is Indian Ocean and BOT is British Overseas Territory								

In the Commonwealth LA&C region, the three most connected nations with India (at human level), viz., Guyana, Suriname and Jamaica also have the potential to increase their trade and services connectivity with India. In fact, PM, Shri Narendra Modi had a virtual engagement with Guyana and Suriname Presidents where they were invited as Chief Guests at the 17th Pravasi Bhartiya Divas, 2023. These events reflected the PM's outreach to the Indo-Guyanese diaspora (40% of population) and Indo-Surinamese diaspora (27% of population).

Amongst the ASEAN nations, Myanmar has the highest potential for increasing trade with India as its HCI-TGIf gap is 16.7 (HCI-TGSIf = 14.9) followed by Singapore, Philippines, Malaysia and Brunei. In 2018, India hosted the 10th Regional PBD in 2018, themed "Ancient Route, New Journey," in Singapore, to celebrate India-ASEAN diaspora ties. The PM engaged with Indian professionals and traders to deepen economic and cultural links.

Tonga, New Zealand, Fiji and Australia, mentioned in descending order of HCI-TGIf gap (however Australia's HCI-TGSIf gap exceeds that of Fiji) also show potential for enhanced mutually beneficial trade with India. Australia and India have already entered into a Free Trade Agreement w.e.f. Dec 29, 2022. This will help reduce the HCI-TGI gap given the significant gains to both the countries in terms of economic growth post the implementation of the FTA.

New Zealand has the second highest HCI-TGIf gap (8.7) amongst developed countries (excluding GCC) followed by Canada (6.6). This gap lowers slightly when TGIf is replaced by TGSIf. This is explained by the higher TSIf of these countries compared to their TGIf. The U.S. is the only developed country that has an HCi-TGI and HCI-TGSI gap of less than 2. India is already in talks with the U.S. to have a Bilateral Free Trade Agreement. It is expected to be finalized in 2025 itself.

Amongst the commonwealth nations of Africa that lie in the top 40 (Table 12), Mauritius has the highest potential for further trade with India (HCI-TGI= 13.4, HCI-TGSI=11.3), followed by Lesotho, Zambia, Botswana, Malawi and Tanzania. India already has robust economic relations with Mauritius and has signed a CECPA trade agreement with India in 2021. It is expected that the HCI-TGI gap will decrease for Mauritius.

Appendix 2: Gravity Model estimation using PPML (equation 3)

Variables	Tradeij
ln(GDPj)	0.68***
	(0.05)
ln(Distij)	-0.61***
	(0.17)
comcol	0.48***
	(0.15)
HCI	0.03***
	(0.01)
Pandemicyr	-0.20***
	(0.06)
FTA	0.2
	(0.18)
combord	0.05
	(0.17)
landlockj	-0.73**
	(0.31)
year_2014	(0.01)
	(0.02)
year_2015	-0.12***

	(0.04)
year_2016	-0.18***
	(0.05)
year_2021	0.11*
	(0.06)
year_2022	0.28***
	(0.08)
year_2023	0.19*
	(0.1)
constand	9.70***
	(1.37)
No. of observations	506
R-squared	0.87
Pseudo log-likelihood	-775269.67
Standard errors are in paranthesis. ***:p<0.01, **:p<0.05, *:p<0.10 Year dummies that are not significant are not shown in the table.	

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