DISCUSSION PAPER

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Enhancing Multimodal Connectivity in the BBIN Sub-region

Air Connectivity in Perspective

Joining Dots • Connecting People • Shared Prosperity

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Multimodal connectivity is an important driver of regional integration. Countries in the BBIN (Bangladesh, Bhutan, India, and Nepal) sub-region are working to tap regional growth and development through multimodal connectivity. This Discussion Paper looks at the role of air connectivity in integrating the region and its contribution to making logistics more efficient, economical and seamless. It begins by identifying an air services network of the BBIN sub-region involving nodes containing 23 city clusters.

Then the paper depicts the existing airborne intra-regional trade and identifies two cross-border value chains likely to spur the demand for multimodal connectivity involving air transport. It also sheds some light on disruptions in global value chains caused by the COVID-19 pandemic and highlights the role of air connectivity during such difficulties.

Going forward, the paper argues that the growth of e-commerce in the BBIN sub-region will significantly boost air connectivity and positively impact intra-regional trade. It concludes by presenting some challenges and suggesting the way forward.

Introduction

Multimodal connectivity is the driver of regional integration as it boosts intra-regional trade and promotes inclusive economic development. The sub-region of South Asia, comprising BBIN, seeks to tap regional growth and development through multimodal connectivity. As BBIN nations look to operationalise the Motor Vehicles Agreement (MVA) to enable seamless movement to facilitate trade and people-to-people contact, multimodal connectivity is critical in improving logistical performances.

Air connectivity enables a country to unlock its economic growth potential by attracting business investments and human capital. It enhances connections between businesses, governments and people, thus enabling trade, investments, tourism and travel. According to the International Civil

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Aviation Organisation (ICAO), aviation carries only 0.5 per cent of world trade by volume. Still, it represents 34.6 per cent of global trade by value (IATA, Air Connectivity- Measuring the connections that drive economic growth).

This significant disparity between tonnage and value reflects air cargo's unique position in transporting goods that often require high speed, reliability, and security. Generally, air freight is priced 4-5 times higher than road transport and 12-16 times that of sea transport (World Bank, 2009). Commodities shipped by air have high values per unit and are very time-sensitive.

Evidence from the World Bank Logistics Performance Index (LPI) indicates that, for countries at the same level of per capita income, those with the best logistics performance experience an additional growth of one per cent in Gross Domestic Product and two per cent in trade. According to World Bank's Aggregated Logistics Performance Index 2012-2018, India is 42nd, Bangladesh is 100th, Nepal 121st and Bhutan 151st.[1] As all countries focus on improving their rank on the LPI and enhancing competitiveness in the global supply chain, multimodal connectivity is emphasised.

This paper looks at the role of air connectivity in integrating various modes of transport in the BBIN sub-region. It argues that air connectivity may help reduce the over-reliance on road transport that creates chokepoints at the land borders and help make logistics more efficient and seamless. Studying the regional value chains it highlights the salience of improving air connectivity to benefit intra-regional trade. The paper suggests ways to improve air connectivity in the BBIN sub-region.

Multimodal Connectivity in the BBIN Sub-region

Multimodal connectivity is essential for connecting intermediate and final production centres with markets. This is done by facilitating freight movement and lowering freight costs, reducing travel time, lowering cost per tonnage, or both.

Bhutan and Nepal are landlocked nations without access to the sea or inland ports, contrasting with India and Bangladesh. Additionally, there is very little rail connectivity in these two nations. Nepal, for instance, depends on the Indian ports of Kolkata, Paradip, and Vishakhapatnam for its seaborne trade. In Nepal, international connectivity is largely maintained via aviation, but expansion is limited by the geography of the nation, a lack of advanced technology, and under-qualified operations.

Bhutan is in a similar situation. Landlocked Bhutan's small population of less than a million is dispersed through mountainous terrain where seismic risks are high and weather conditions formidable. A lack of suitable inter-modal connectivity is also common in Bangladesh and India.

Table 1: Share of Different Modes of Freight Transport in the BBIN Sub-region

Country	Roadways	Railways	Waterways	Air/Other
Bangladesh	60%	12%	14%	14%
Bhutan	95%	Not Available	Not Available	5%
India	59%	35%	6%	1%
Nepal	90%	Not Available	Does not exist	Not available

Source: (CUTS, 2019)

[1] The Aggregated LPI combines the four most recent LPI editions. It compares 167 countries. https://lpi.worldbank.org/international/aggregated-ranking

South Asia remains a laggard in intra-regional trade[2], and a low logistical integration also characterises it. Almost all of South Asia's intra-regional merchandise trade is carried out by the road. As a sub-region within South Asia, BBIN is faced with the same problems. Freight movement in the BBIN sub-region is heavily skewed towards road transportation (CUTS, 2019).

Heavy reliance on road transport for inland cross-border freight traffic denies the advantages of intermodal shifts of freight traffic. Though the road is not the cheapest mode, all other modes lack first and last mile connectivity, including railways, waterways and airways.

Several studies have been published on how multimodal connectivity can help bring down the cost of transportation in the BBIN sub-region by using alternate modes of transportation for cross-border trade (CUTS, 2019) (UNESCAP, Strengthening Freight Transport Corridors of South Asia in the Aftermath of COVID-19, 2021). If the first mile and last mile connectivity of modes other than roads are developed, the logistics cost in the region can be brought down considerably.

Air connectivity is an integral part of multimodal connectivity. It is inherently multimodal as it involves the carriage of people or goods along with at least one other mode of transport.

Air Network in the BBIN Sub-region

Any discussion on air connectivity in the region presumes an air services network, as in this case, a network in the BBIN sub-region. Network refers to the framework of routes within a system of locations known as nodes. Thus, the air transport network is a complex web comprising airports as network nodes and refers to direct air services between them.

Table 1 lists the main airports (nodes) and their connectivity with other nodes in the BBIN sub-region, thus forming airport city clusters in the BBIN sub-region.

Table 2: Nodal Air Links in the BBIN Sub-region[3]

Sr. No	Airport	Code	Intra-BBIN destinations	Carriers and Frequency
1	Ahmedabad (India)	AMD	No direct flight, but it is connected to intra-BBIN destinations via Kolkata, Hyderabad, New Delhi, Mumbai and Chennai	
2	Bagdogra (India)	IXB	Paro (Bhutan)	Druk Air: Bi-weekly (Tu-Sa)
3	Bengaluru (India)	BLR	Dhaka (Bangladesh); Kathmandu (Nepal)	Dhaka: Spicejet (Daily) Kathmandu: Himalaya Airlines (Daily) Biman Airlines Five Days a Week (Su-Mo-We-Th-Sa)

[2] South Asia is often characterised as the least integrated into the Asia-Pacific region, with intraregional trade accounting for only 6.1 per cent of total trade in 2015, which is appallingly low in comparison to 27.4 per cent in ASEAN.)

[3] *This is an indicative indicate schedule of about flights between the respective airports as on August 19, 2022.*

Sr. No	Airport	Code	Intra-BBIN destinations	Carriers and Frequency
4	Chennai (India)	MAA	Dhaka (Bangladesh); Paro (Bhutan)	Dhaka: US-Bangla Airlines (Daily) Indigo Airlines Four Days a week (Su-Mo-We-Fr); Paro: Druk Air (Weekly) (We)
5	Chittagong (Bangladesh)	CGP	Kolkata (India)	Spicejet Daily
6	Dhaka (Bangladesh)	DAC	Kathmandu (Nepal); Paro (Bhutan); New Delhi, Kolkata, Chennai, Hyderabad, Mumbai (India)	Kathmandu: Himalaya Airlines (Daily), Biman Airlines Five-Days a week (Su-Mo-We-Th-Sa); Paro: Druk Air Five Days a week (Mo-We-Th-Fr-Sa); New Delhi: Biman Airlines, Indigo and Vistara (Daily); Chennai: US-Bangla Airlines (Daily), Indigo Four Days a week (Su-Mo-We-Fr); Mumbai: Spicejet (Daily)
7	Guwahati (India)	GAU	Paro (Bhutan)	Druk Air: Weekly (Mo)
8	Hyderabad (India)	HYD	Dhaka (Bangladesh)	Indigo: Four Days a Week (Mo-Tu-Th-Sa)
9	Kathmandu (Nepal)	KTM	Dhaka (Bangladesh); Paro (Bhutan); New Delhi, Bengaluru, Varanasi, Kolkata, Mumbai (India)	Dhaka: Himalayan Airlines (Daily), Biman (Su-Mo-We-Th-Sa); Paro: Druk Air (Mo-We-Th-Fr-Sa); Bengaluru: Nepal Airlines (Tu-Th-Sa); New Delhi: Air India, Indigo, Nepal Airlines, Vistara (Daily), Druk Air (We-Sa); Mumbai: Indigo (Daily), Nepal Airlines (Su-We-Fr)
10	Kolkata (India)	CCU	Dhaka, Chittagong (Bangladesh); Kathmandu (Nepal); Paro, (Bhutan)	Dhaka: Biman Airlines, Indigo, SpiceJet, US-Bangla Airlines (Daily), Air India (Mo-We-Fr), Paro: Druk Air (Tu-We-Fr); Kathmandu: Air India (Su-Tu-Th-Sa), Chittagong: Spice Jet (Daily)
11	Mumbai (India)	BOM	Kathmandu (Nepal); Dhaka (Bangladesh)	Dhaka: Biman, Indigo, Vistara (Daily); Kathmandu: Indigo (Daily), Nepal Airlines (Su-We-Fr)
12	New Delhi (India)	DEL	Dhaka (Bangladesh), Kathmandu (Nepal); Paro (Bhutan)	Dhaka: Himalayan Airlines (Daily), Biman Airlines (Su-Mo-We-Th); Kathmandu: Indigo, Nepal Airlines, Vistara, Air India (Daily); Paro: Druk Air (Mo-We-Th-Fr-Sa)
13	Paro (Bhutan)	PBH	Dhaka (Bangladesh); Kathmandu (Nepal); New Delhi, Kolkata, Guwahati, Bagdogra (India)	Dhaka: Druk Air (We); Kathmandu: Druk Air (We); Himalayan Airlines (Daily), Biman Airlines (Su-Mo-We-Th); New Delhi: Druk Air (Su-Mo-We-Th-Fr-Sa); Kolkata: Druk Air (Su-Mo-Tu-Fr); Guwahati: Druk Air (Su); Bagdogra: Druk Air (Tu-Sa)
14	Varanasi (India)	VNS	Kathmandu (India)	Buddha Air (Mo, Fr)

Source: Prepared by the author based on information available at (FlightConnections)

It is evident from Table 2 that a total of 13 airports, except for one, i.e. Ahmedabad have a direct flight to one or more airports in the BBIN sub-region. There are 23 city clusters (pairs of airports, e.g. Kolkata-Chittagong) in the BBIN sub-region, as evident in Table 2. The airports of Dhaka and Kathmandu have the highest number of direct flights to seven airports in the BBIN sub-region.

Bangladesh's major air hub, the Dhaka Airport, has direct flights with Kathmandu, Paro, Kolkata, New Delhi, Chennai, Hyderabad and Mumbai airports. Meanwhile, the Chittagong airport in Bangladesh only has direct flights to Kolkata airport. Kathmandu airport, Nepal's air gateway, has direct flights to Dhaka, Paro, Kolkata, New Delhi, Bengaluru, Varanasi and Mumbai. Similarly, Bhutan's Paro Airport has direct flights to Dhaka, Kathmandu, Kolkata, New Delhi, Guwahati and Bagdogra. Kolkata and New Delhi airports have direct flights to four and three international flights, respectively, to BBIN countries. Further, both airports are well connected with all major airports within India.

The Chhatrapati Shivaji Maharaj International Airport (BOM) in Mumbai has one direct flight to Dhaka and Kathmandu. From Mumbai, one daily flight to Kathmandu is managed by one airline, while another has a tri-weekly operating flight to the exact location. The Mumbai airport has no flights to Paro. The Kempegowda International Airport in Bengaluru (BLR) has daily international flights to Dhaka and Kathmandu. The Chennai International Airport (MAS) has a daily flight to Dhaka and a weekly flight to Paro.

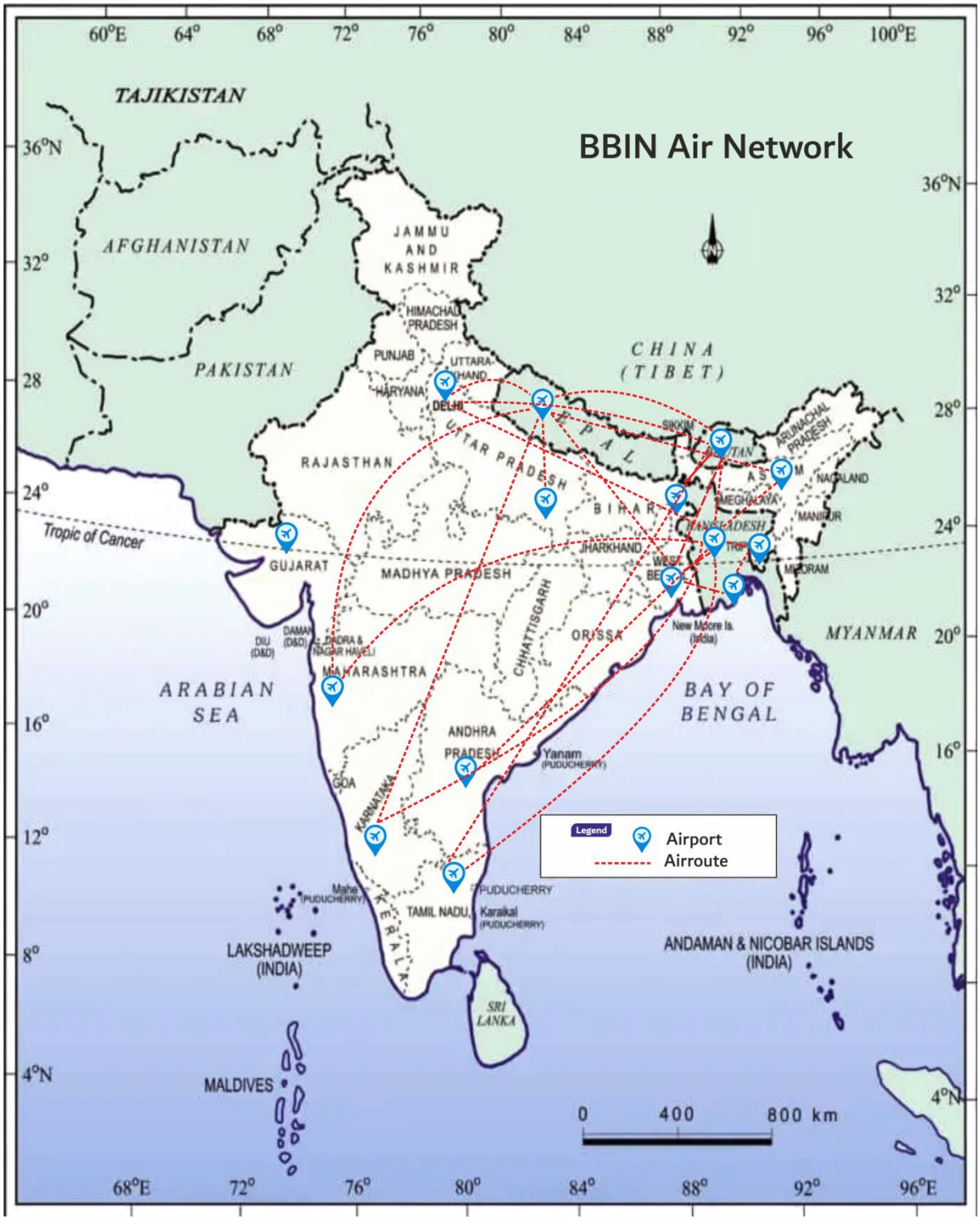
The other five airports listed in Table 2, viz., Hyderabad, Varanasi, Guwahati, Bagdogra and Chittagong, have links only to one intraregional destination. Only one airport listed in Table 2 viz. Ahmedabad has no direct flights to either of the BBIN countries, the city being important as a textile export destination and a hub for transhipment has been included in Table 2. Each of the 23 city clusters identified in Table 2 are growth and nerve centres for trading activities. Almost all airports listed in the table above are monopoly airports, i.e. they are not located within 200 km of another airport. The airports of New Delhi, Kolkata, Mumbai, Bengaluru, Dhaka and Kathmandu are the major aviation hubs in the BBIN sub-region.

Under the UDAN International Scheme for enhancing connectivity between Indian states and international destinations, the Union Civil Aviation Ministry had opened the bidding by airlines for the routes- Guwahati-Bangkok-Guwahati, Guwahati-Dhaka-Guwahati, Guwahati-Kathmandu-Guwahati, Guwahati-Yangon-Guwahati, Guwahati-Hanoi-Guwahati, Imphal-Mandalay-Imphal, Imphal-Bangkok-Imphal, Imphal-Kunming-Imphal, Bhubaneshwar-Bangkok-Bhubaneshwar, Bhubaneshwar-AbuDhabi-Bhubaneshwar, Bhubaneshwar-Singapore-Bhubaneshwar, Agartala-Dhaka-Agartala, and Agartala-Chittagong-Agartala routes. Once operationalised, these routes will serve as a gateway for boosting international travel and cargo movement to and fro from India's North-Eastern Region (NER).

Nepal inaugurated the country's second international airport that will help connect Lumbini, the birthplace of Lord Buddha and a major tourist and pilgrimage destination, to Buddhist circuits in South Asia and the rest of the world. Bangladesh has also undertaken a project to upgrade Cox's Bazaar and Syedpur Airports to international airports (Shiraz, 2022).

Figure 1 shows the existing air network in the BBIN sub-region, with 14 airports having direct links with one or more direct flights. Also included are the proposed flights between Agartala-Dhaka, Agartala-Chittagong, Guwahati-Dhaka and Guwahati-Kathmandu.

Figure 1: Air Network in the BBIN Sub-region



Source: Prepared by Sumanta Biswas, Senior Programme Officer, CUTS International.

Airborne Trade in the BBIN Sub-region

A strong correlation exists between growth in international trade and logistics infrastructure. Improved logistics in the BBIN sub-region can help reduce the cost of transportation which, in turn, can contribute directly to the country's global competitiveness. An efficient logistics industry can act as an economic catalyst by opening up new market opportunities and moving products and services quickly and efficiently (Ministry of Civil Aviation, 2012).

Table 3: Share of Foreign Trade by Air in Total Foreign Trade of India from 2015-16 to 2019-2020)

Year	Total Export (Rs. Crores)	Airborne Export (Rs. Crores)	% Share of Airborne Export	Total Import (Rs. Crores)	Air-borne Import (Rs. Crores)	% Share of Airborne Import	Total Trade (Rs. Crores)	Total Air-borne Trade (Rs. Crores)	% share of Airborne Trade
2015-16	17,16,378	4,03,077	23.48	24,90,298	5,99,382	24.07	42,06,676	10,02,459	23.83
2016-17	18,49,429	4,29,598	23.23	25,77,666	5,86,971	22.77	44,27,094	10,16,569	22.96
2017-18	19,56,515	4,09,770	20.94	30,01,033	7,25,376	24.17	49,57,548	11,35,146	22.90
2018-19	23,07,726	4,60,381	19.95	35,94,675	7,56,646	21.05	59,02,401	12,17,026	20.62
2019-20	22,19,854	43,08,94	19.41	33,60,954	6,92,199	20.60	55,80,808	11,23,093	20.12

Source: (Statistics D. G., 2022)

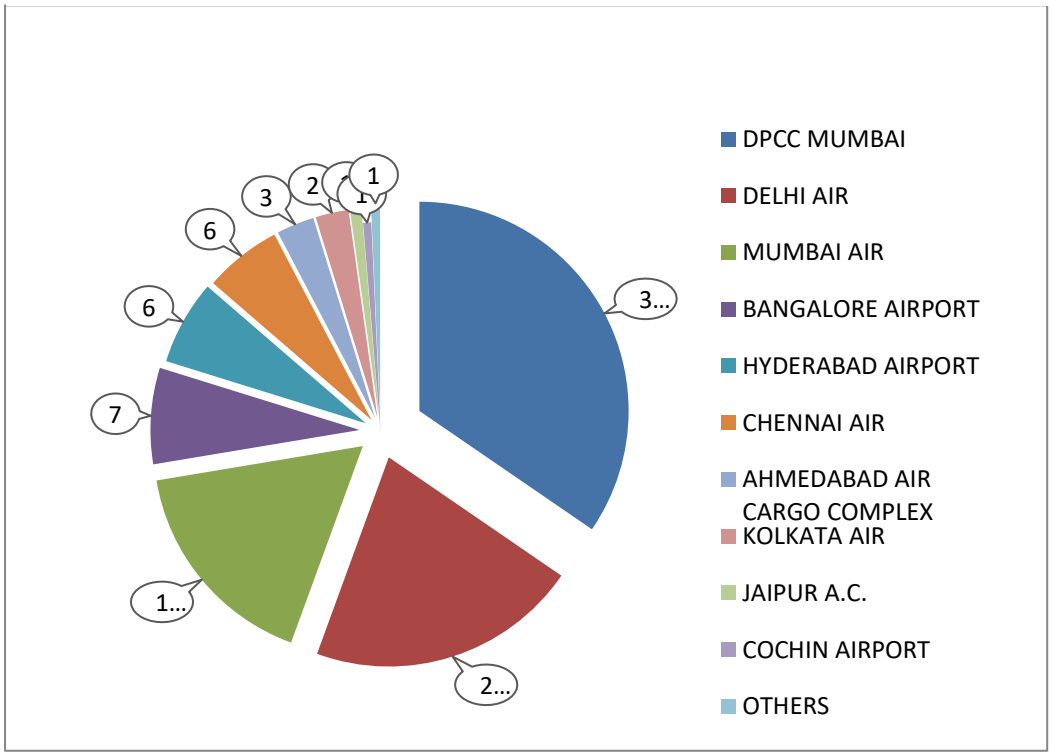
Table 3 suggests that the percentage share of India's Airborne trade to total trade has remained around the 20 per cent mark. The percentage share of India's airborne trade shows a diminishing trend. From 2015-16, when it was 23.86 per cent, the share dipped to 20.12 per cent in 2019-20. Also, the percentage share of India's Airborne imports in total imports was higher than airborne exports in total, except for the year 2016-17, when the share of airborne exports (23.23 per cent) was slightly higher compared to the imports (22.27 per cent).

Bangladesh's airborne trade statistics were unavailable (Statistics B. B., 2021).[4] Meanwhile, the Tribhuvan International Airport in Kathmandu had an import share of 9.54 per cent (NPR 114,202,680,000) of Nepal's total imports in 2019-20 and 20.40 per cent (NPR 19,937,489,000) of Nepal's total exports in the same year (Customs, 2020).[5] This was the only airport in Nepal listed under the table of Import and Exports under Customs Offices that document 24 custom offices and their share in the value of Nepal's total import's value of NPR 1,196,799,053,000.

[4] Foreign Trade Statistics for Bangladesh for the year 2019-20 do not state the country's export or import value by the air route. Bangladesh exported total of Tk. 2811668 million worth goods out of which Tk. 2766288 million were sent through sea-route and Tk. 45380 million through the land route.

[5] 1 Nepalese Rupee=0.63 Indian Rupee as per the September 2022 exchange rate.

Figure 2: Share of Major Airports in Air-borne Foreign Trade Export of India during 2019-20



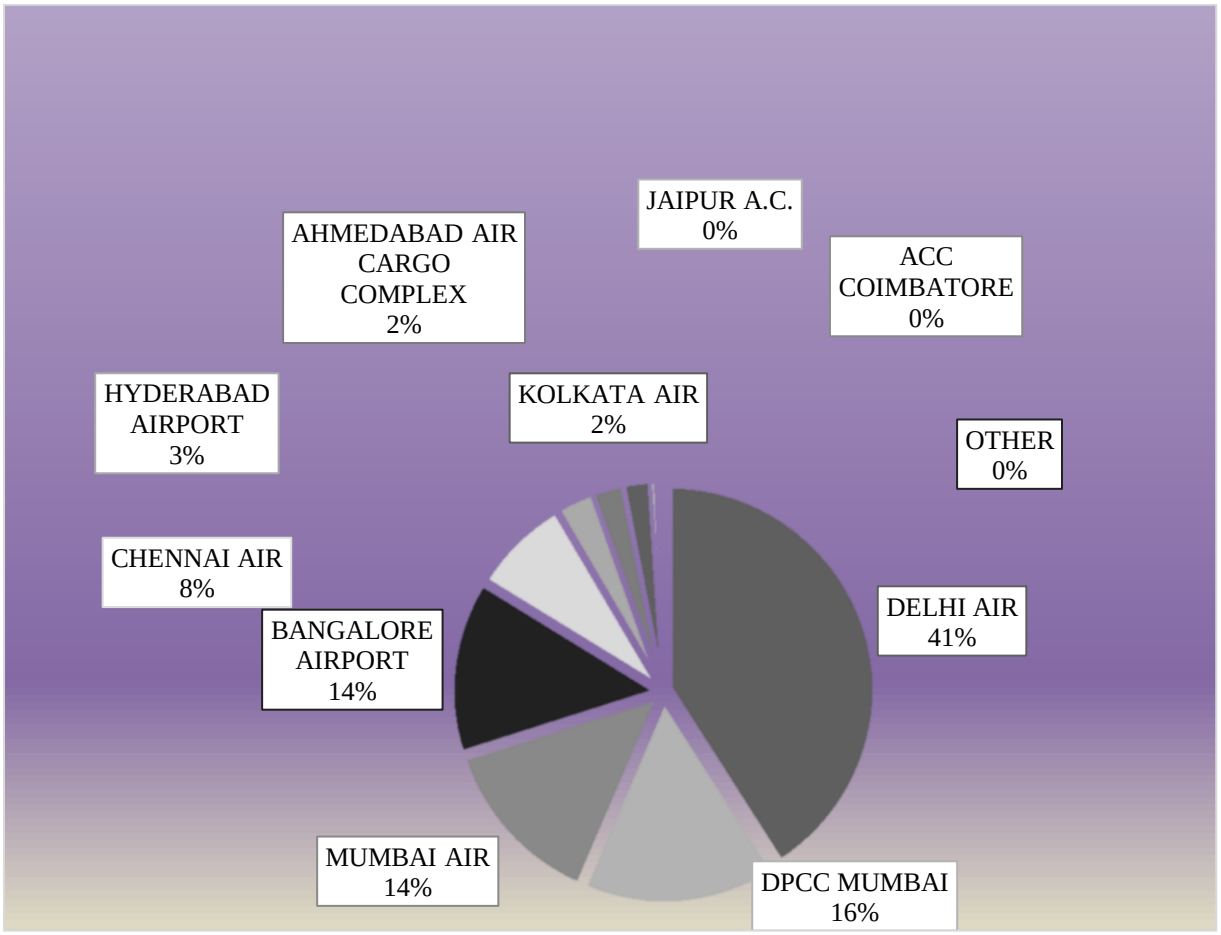
Source: DGCIS

In the case of Bhutan, the trade statistics for 'Region wise Import and Export from January 01-December 31, 2019', show that the Paro Air Cargo and Paro Airport Terminal had a meagre share in the country's exports and imports (CUSTOMS, 2020). While the share of Bhutan's Paro International Airport in the country's exports to India was negligible (0.00005 per cent); it was slightly higher (0.0089 per cent) in Bhutan's imports from India (CUSTOMS, 2020). The share of Paro Airport in Bhutan's total exports to countries other than India was 0.026 per cent, while the share in imports was 0.23 per cent (CUSTOMS, 2020).

As shown in Figure 2, in India, the Diamond Plaza Customs Complex (DPCC) Mumbai exported merchandise worth Rs. 148956.25 crores having the highest share of (35 per cent) in major airports in India's Airborne foreign trade exports in the year 2019-20. Delhi Airport was a distant second with 21 per cent. Mumbai Airport (distinct from DPCC) had a share of 17 per cent. Bangalore, Hyderabad and Chennai Airports had a single-digit percentage of 7 per cent, 6 per cent and 6 per cent, respectively. The Ahmedabad Air Cargo Complex had a share of 3 per cent in India's airborne exports in 2019-20, while Kolkata Airport had a 2 per cent share in the same year.

For the corresponding year, the Tribhuvan International Airport in Nepal had a 9.54 per cent share of the country's total import value and a 20.40 per cent share in Nepal's total export value.

Figure 3: Share of Major Airports in Airborne Foreign Trade (Import) of India in 2019-20



Source: (Statistics D. G., 2022)

Analysis of the pattern of Foreign Trade of India, exports and imports, in terms of principal commodities through various major airports reveals that the top 6 airports account for 92.32 per cent of the total exports through airports. The top 6 airports account for almost 94.54 per cent of the total imports through airports.

It may be inferred from the trade data available in the case of Nepal and Bhutan that the Tribhuvan International Airport and Paro International Airport were the only airports for which airborne trade was recorded in the respective countries. This suggests that airborne trade only happened through these airports in the two countries, and in the case of Bangladesh, airborne trade data was unavailable.

Air Connectivity in Existing Cross-Border Value Chains in the Sub-region

Multimodal connectivity is pivotal in connecting the production centres (intermediate and final) with marketplace places leading to the creation of cross-border value chains by easing freight movement and diminishing freight cost, either through the reduction in travel time and/or by the decrease in cost per tonnage, or, both (CUTS, 2019).

Table 4: Share of Major Principal Commodities in India's Airborne Foreign Trade (Export) during 2019-20

PRINCIPAL COMMODITIES	VALUE (INR Cr.)	% SHARE OF EXPORT
Pearl, Precious, Semiprecious Stones	1,42,175.55	33.00
Drug Formulations, Biologicals	42,077.75	9.77
Electric Machinery and Equipment	29,981.81	6.96
Gold and Other Precious Metal Jewellery	23,547.89	5.46
Petroleum Products	16,264.62	3.77
Bulk Drugs, Drug Intermediates	14,719.10	3.42
Residual Chemical and Allied Production	13,835.18	3.21
Telecom Instruments	12,960.38	3.01
RMGs Cotton, including Accessories	12,255.13	2.84
Gold	9,072.53	2.11
Others	1,14,004.29	26.46
Total	**4,30,894.23**	**100.00**

Source: (Statistics D. G., 2022)

Table 4 shows that the main item exported by India by air route are pearls, precious and semi-precious stones accounting for around 33 per cent share of India's total airborne trade in the year 2019-20. The rest of items traded by India included 'Drug Formulations, Biologicals' accounting for 9.77 per cent, Electrical Machinery and Equipment for 6.96 per cent and Gold and Other Precious Metal Jewellery for 5.46 per cent of India's total exports through airports. Bulk Drugs and Drug Intermediates had a percentage share of 3.42 per cent. Readymade garments (RMGs) made of cotton, including accessories, also had a 2.84 per cent share and were among the principal export commodities.

As can be seen in Table 4, drug formulations and biologicals had a share of 9.77 per cent of India's airborne exports. Bulk Drugs and Drug Intermediaries also constitute a 3.42 per cent share of India's airborne exports. The breakup of commodities exported or imported by air route in the case of Bangladesh, Bhutan and Nepal were unavailable.

Cross-border value chain linkages exist between BBIN countries in the pharmaceutical sector. Nepal is one of the largest exporters of medicinal plants, and India and Bangladesh export pharmaceutical products to Nepal and Bhutan. Bangladesh imports 80 per cent of Active Pharmaceutical Ingredients (APIs) and other raw materials used to produce finished drugs. These APIs and raw materials mainly come from different countries, including India. Indian companies supplying APIs have a sizeable market in Bangladesh with no entry barriers and the advantages of low transportation costs. India already provides 30 per cent of its APIs to Bangladesh (Sandhu, 2021).

India met 8.2 per cent of Bangladesh's imports in pharmaceutical machinery as of 2020, and there still lies a huge untapped market for pharma equipment makers in the country, which is yet to be explored

(Excelsior, 2022). Union Minister for Commerce and Industry Piyush Goyal said that India and Bangladesh could become 'the Pharmacy of the World' while adding that time was ripe for the two countries to consider joint manufacturing of COVID-19 vaccines and other medicines (Service, 2022). Minister Goyal also called for the two countries to explore potential investment areas, including APIs for pharmaceuticals and medical equipment.

In the case of imports (Table 5), the main items imported through the air route by India in 2019-20 were gold (18.83 per cent), pearl precious and semi-precious stones (13.57 per cent), electronic components (12.56 per cent), telecom instruments (11.54 per cent) accounting for 56.50 per cent of total imports through airports (Table 5).

Table 5: Share of Major Principal Commodities in India's Airborne Foreign Trade (Import) during 2019-20

PRINCIPAL COMMODITIES	VALUE (INR Cr.)	% SHARE OF IMPORT
Gold	1,30,333.11	18.83
Pearl, Precious, Semiprecious Stones	93,931.95	13.57
Electronics Components	86,962.14	12.56
Telecom Instruments	79,876.75	11.54
Electric Machinery and Equipment	46,914.71	6.78
Computer Hardware, Peripherals	39,523.77	5.71
Electronics Instruments	29,139.10	4.21
Medical and Scientific Instruments	21,594.70	3.12
Consumer Electronics	16,351.67	2.36
Machinery For Dairy etc	12,601.63	1.82
Others	1,34,969.57	19.50
Total	**6,92,199.09**	**100.00**

Source: (Statistics D. G., 2022)

Another value chain in the BBIN sub-region is RMGs, which predominantly require raw cotton, cotton yarns, apparel fabrics and manufactured fibre (CUTS, 2019). India is the largest exporter of raw cotton to Bangladesh. A World Bank policy paper pointed out significant value chain linkages between India and Bangladesh, particularly in the textile and apparel sectors (Mahfuz Kabir, 2019).

While India specialises in the upstream segment, supplying such intermediate inputs as silk, cotton, yarn, and fabrics to Bangladesh, the latter specialises in the downstream final apparel segment, exporting worldwide and to India.

In the financial year 2019-20, India exported raw materials for textiles worth US$854.54mn, including cotton (US$706.22mn) and dying, tanning, and colouring matter (US$148.32mn). While air cargo is yet to be the preferred mode of transport for intra-regional between BBIN countries, it augurs well for BBIN nation's third country exports.

In January 2019, the first-ever bonded cargo from Bangladesh to Europe was transhipped from Kolkata airport. Bangladesh's garment shipment to Europe has been expedited with the introduction of a transshipment facility from Kolkata's Netaji International Airport on a pilot basis (Resources, 2019). The cargo, weighing 4.1 tonnes, was carried by Bangladeshi trucks to the Benapole land port

and loaded onto Indian trucks. The Indian trucks carried the goods to the Kolkata airport, which was transhipped to Europe. Again, in March 2021, as part of a road-air operation, SpiceJet's cargo arm SpiceXpress helped transport 48 tonnes of cargo from Dhaka in Bangladesh to Spain via Kolkata and New Delhi (Rana, 2021).

The Hazrat Shahjalal International Airport in Dhaka is facing a stiff challenge as it handles 1.5 times more cargo than its capacity. This airport is overwhelmed by exports of RMGs. Hence, Bangladesh's move to transhipping its exports to western countries through Indian airports may have been deemed necessary. With an increase in containerised cargo at Dhaka, the congestion will likely soar, prompting Bangladeshi exports to divert shipments to other regional airports.

Table 6 lists the number of airports and provides the top commodities exported by districts close to the airports.

Table 6: Airports in the Sub-region within proximity to top exporting centres

Airport	Top Exporting Districts in close proximity	Top items exported by districts
New Delhi	Gurugram (Haryana)	Home furnishing & engineering goods, RMGs of all textiles, electronic goods, cotton yarn/fabrics/made-ups, handloom products etc.
Kolkata	Kolkata	Gems and jewellery, engineering goods, leather and leather goods, , RMGs of all textiles
Mumbai	Mumbai, Thane, Pune, Raigad, Aurangabad	Gems and jewellery, engineering goods, RMGs of all textiles, organic and inorganic chemicals and drugs and pharmaceuticals
Bengaluru	Bengaluru, Dakshina Kannada	Engineering goods, electronic goods, and RMGs of all textiles, drugs and pharmaceuticals, cashew nuts and spices, marine products, jack fruit, plastic components, light engineering (auto components, electrical, plastic machinery etc.), tourism, value-added plastic items (woven sacks/FIBC), optical items, moulded and extracted items, packaging items, plastic components
Dhaka	Dhaka	Textile and apparel items, home textile products, leather and leather goods, jute products, fish and shrimps, pharmaceuticals, ships and vessels, agricultural goods
Kathmandu	Kathmandu	Woollen carpet, iron and steel products, RMGs, yarns and pashmina, handicrafts, cardamom, tea, coffee, fruit and vegetable juices, and medicinal herbs
Paro	Thimphu	Boulders, ferro-silicon-manganese, dolomite, gypsum
Ahmedabad	Jamnagar, Surat, Bharuch, Vadodara, Ahmedabad, Dwarka and Kutch	Drugs and pharmaceuticals, engineering goods, cotton yarn, fabrics, made-up handloom products, petroleum products, organic and inorganic chemicals, plastic and linoleum, gems and jewellery,

Airport	Top Exporting Districts in close proximity	Top items exported by districts
Chennai	Chennai, Kanchipuram, Tiruppur	Biotechnology, food processing, marine products, jewellery products, apparel, software and software services
Hyderabad	Eastern Godavari District, Vizag	Engineering goods, organic and inorganic chemicals, drugs and pharmaceuticals, marine products, petroleum products, rice, meat, dairy and poultry products

Source: *Compiled by the author based on* (Industry, 2021)

All nine airports listed in Table 6 can potentially boost trade in the BBIN sub-region further. Generally, airports are potential aggregators of goods. For instance, Ahmedabad airport is likely to be used to export commodities, such as textiles, fruits, Surat Zari craft, and pomegranate exported from Surat District, the latter being approximately 5 hours by road. Similarly, suppose Gurugram in Haryana exports RMGs of all textiles, electronic goods, cotton yarn/fabrics/made-ups, and handloom products. In that case, it is most likely to use the New Delhi airport.

With electronics manufacturing as a key component, India's *Atmanirbhar Bharat* strategy seeks to transform the nation into a worldwide technology and manufacturing centre. India is positioned to take advantage of the electronics value chain because of a supportive domestic policy environment and a favourable geopolitical context.

Due to many policy initiatives, India's electronics system design and manufacturing (ESDM) sector has seen significant expansion in recent years. Electronics production climbed from US$25bn in 2014-15 to US$75bn in 2020–21, rising at a compound annual growth rate of 25 per cent (Jindal, 2021).

The Government of India has a National Policy on Electronics, 2019, that aims to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities in the country for developing core components and creating an enabling environment for the industry to compete globally.

Four schemes, namely the Production Linked Incentive for Large Scale Electronics Manufacturing and IT Hardware, Promotion of Manufacturing of Electronic Components and Semiconductors, and Modified Electronics Manufacturing Clusters, have been introduced to boost the electronics sector and establish the necessary ecosystem.

The Union Government is facilitating industrial development in the Northeastern Region (NER) by offering benefits such as capital and interest incentives Income Tax and Goods and Services Tax (GST) reimbursements. From 2017 onwards, the North East Industrial Development Scheme (NEIDS) has come into force for five years, covering the manufacturing and service sector of all the States of the NER, including Sikkim (Region, 2021). There is an overall cap of Rs.200 crore per unit for benefits under all components subject to investment in Plant and Machinery.

Under Union Budget 2021-22, the Indian government expanded the scope for 'Krishi Udaan' in convergence with Operation Green Scheme, wherein air freight subsidy of 50 per cent for agri-

perishables would be provided to North-East states and 4 Himalayan States/UTs. Expanding product coverage will boost the '*Krishi Udaan'* scheme and improve air cargo transportation from these states.

The Northeastern State of Tripura is building up a Special Economic Zone (SEZ) at Sabroom, the southernmost town bordering Bangladesh. It would focus on four sectors: agro-based processing, rubber, bamboo, and textiles. The SEZ — around 120 km from Agartala — is set up with an investment of Rs 635 crore and is expected to create about 5,000 new jobs.

India is also developing various Industrial Corridor Projects as part of the National Industrial Corridor programme aimed at developing futuristic industrial cities in India that compete with the best manufacturing and investment destinations in the world (Trade). All seven Indian airports listed in Table No. 6 touch each of the 11 industrial corridors being developed. The corridors are:

- Delhi Mumbai Industrial Corridor (DMIC)
- Chennai Bengaluru Industrial Corridor (CBIC)
- Extension of CBIC to Kochi via Coimbatore
- Amritsar Kolkata Industrial Corridor (AKIC)
- Hyderabad Nagpur Industrial Corridor (HNIC)
- Hyderabad Warangal Industrial Corridor (HWIC)
- Hyderabad Bengaluru Industrial Corridor (HBIC)
- Bengaluru Mumbai Industrial Corridor (BMIC)
- Vizag Chennai Industrial Corridor (VCIC)
- Odisha Economic Corridor (OEC)
- Delhi Nagpur Industrial Corridor (DNIC)

Thus, air connectivity would play a crucial role in developing the 11 industrial corridors and is expected to boost intra-regional trade in the BBIN sub-region.

Air Connectivity during the COVID-19 Pandemic

The outbreak of the COVID-19 pandemic severely constrained the regular movement of people and goods. The imposition of lockdowns saw a dire crisis as migrants worldwide remained stranded, requiring repatriation by their concerned governments. Emergency supplies, such as medicines, Personal Protective Equipment (PPE), food items and vaccines, needed to be provided. Air transport emerged as the preferred medium for evacuating people stuck in foreign lands, supply of emergency relief, including medicines, testing kits, PPE, etc.

As a first responder in the region, India supplied large quantities of essentials such as medicines, testing kits and Personal Protective Equipment (PPE) to many countries, including Bangladesh, Nepal, Bhutan, Afghanistan, Maldives, Seychelles and Mauritius. Prime Minister Narendra Modi also convened the SAARC leaders meeting to combat COVID-19 in the region and pledged to set up a COVID-19 Emergency fund. India contributed the highest, i.e. US$10mn, to the fund that used these funds to transport medical supplies to SAARC countries containing COVID-19 and its impact (Chaudhury, 2020).

Beginning in January 2020, India also started supplying doses of indigenously made COVID-19 vaccines to neighbouring and partner countries under its Vaccine Maitri initiative. India gave over

2291.546 lakh doses of COVID-19 to 100 countries as of May 30, 2022, living up to the expectations of being the 'Pharmacy of the World.'

Table 7 lists the number of doses provided by India to BBIN countries.

Table 7: India's Vaccine Supply to BBIN Countries (in Lakhs as on May 30, 2022

Country	Grant	Commercial	COVAX	Total
Bangladesh	33.00	150.008	42.920	225.928
Nepal	11.120	20.000	63.870	94.990
Bhutan	5.500	--	---	5.500
Grand Total				326.418

Source: (Affairs, 2022)

Bangladesh was the highest recipient of Indian-made vaccines, with 225.928 being air shipped under the grant, commercial basis and COVAX facility. Nepal received the second highest supply of made-in-India vaccine doses under the three categories together, 94.990 lakh. Bhutan received 5.500 vaccines under a grant from India.

During the disastrous second wave of the COVID-19 pandemic in April 2021, an excess of 40 countries provided support to India by supplying liquid oxygen, equipment that can generate oxygen and essential medicines (Sibal, 2021). The Indian Air Force also stepped forward as citizens Scrambled for Oxygen carrying out sorties from many countries to airlift oxygen-related supplies and other equipment back home.

Air Connectivity and e-Commerce

E-commerce has revolutionised logistics in an unprecedented way. A rapid and reliable logistics network is required, with the rising demand for online businesses and customers requiring faster deliveries. Air cargo is best suited for this logistical challenge.

Online retailing is based on the global scale of the internet and can reach more prospective customers quickly in time. Since the world is their marketplace, air cargo is well-positioned to serve their needs and deliver goods globally with speed, efficiency and reliability.

According to an IATA paper, e-commerce is a future growth driver for the air cargo industry, as online shopping boosts demand for parcel delivery services worldwide (IATA, Air cargo and e-commerce enabling global trade, 2019). E-commerce represented 15 per cent of air cargo volumes in 2019 (IATA, E-Commerce & Logistics). This number is continuously growing, and the trend has accelerated during the COVID-19 pandemic.

Besides, air cargo also represents 30-35 per cent of airline revenues due to the increase in demand and decrease in capacity due to the drop in passenger travel. Of this, 18 per cent of air cargo is e-commerce, which is expected to rise to 22 per cent in 2022 (Lakshmi, 2022).

South Asia, as shown by a World Bank publication (Kathuria, 2020), lags behind the rest of the world in activating the potential benefits of e-commerce owing to the significant disparity in online purchases worldwide.

Though e-commerce is at a nascent stage in the region, there is growing evidence of the possibilities of e-commerce. Besides the demographics with a higher younger population, e-commerce has the potential to expand exponentially in the area. Increasing the use of e-commerce by consumers and firms in South Asia could potentially help increase competition and firm productivity and encourage diversification of production and export. Given the informal e-trade across land borders, high-demand goods and services could be easily mediated by e-commerce.

India's e-commerce industry has been on an upward growth trajectory after a surge in digital adoption during COVID-19. The Indian e-commerce market is estimated to be worth over US$55bn in gross merchandise value in 2021. More than 348 million users were conducting online transactions, and nearly 140 million were shopping online (Agency). The e-commerce industry in Bangladesh was worth US$1,648mn in 2019, and it is expected to grow to US$277mn this year and US$377mn by 2023 (Sameh, 2021).

The e-retail industry in India, led by the likes of Amazon and Flipkart, has proven to be a watershed in the domestic cargo sector with an expected contribution of about Rs.5000 crore in fiscal 2018-19, of which air cargo segment would garner around INR 1000 crore.

According to the Express Industry Report 2019, e-commerce players have challenged traditional express operations. In India, surface express logistics is the dominant mode of transportation, followed by air express. However, international or cross-border express transportation is by air mode only. Air transportation is the preferred mode for intercity and international shipments when moving goods.

The e-commerce industry in India already has many companies offering business-to-customer with a wide range of products. As the e-commerce sector expands in Bangladesh and Nepal, the express operations of e-commerce companies in India's can fulfil orders for consumers in the BBIN sub-region. In turn, sellers from Bangladesh, Nepal and Bhutan could access the large Indian market. However, there ought to be a regulatory environment conducive to fulfilling orders within the region.

Conclusion and Way Forward

Air connectivity played a significant role in the BBIN sub-region and beyond during and the post-COVID-19 periods by sustaining the supply lines of medicines and vaccines. Its future potential is, even more, considering the huge scope and opportunities for air connectivity in the sub-region. For this, necessary and concerted efforts must be made to achieve this potential.

First and foremost, more airports and cities within the BBIN sub-region need to be linked with direct flights to boost air connectivity in the region. Presently, only 13 airports in the BBIN sub-region have direct flights. One characteristic of existing air connectivity in the sub-region is that it is primarily limited to capital cities. This is especially true in the case of Bangladesh, Bhutan and Nepal, leaving the considerable potential for other cities untapped (Ojha, 2020).

Liberalisation of aviation services can boost the region's economic development by fostering trade and tourism. In India, commercial airlines are entirely in private hands and have become very competitive, thus attracting a higher number of passengers. Other countries may consider a similar approach.

There needs to be harmonisation of regulations and policies to promote airways infrastructure development in the sub-region. Countries need to adopt common regulations. Existing rules must be

relaxed so that more small and medium-sized operators can successfully pursue aircraft leases and offer services to currently unserved or under-served locations in the region.

Steps are required to liberalise the VISA regime in the region to make it easier for people to travel. An open skies policy can enable air connectivity and promote trade in the area. Airlines operating in the BBIN sub-region may implement Electronic Data Interchange to facilitate quicker and more effective trade operations.

BBIN sub-region's aviation services should be expanded under a hub-and-spoke model, with airports in the capital and large cities serving as hubs and other industrial and business areas serving as spokes. New Delhi, Kolkata, Dhaka, and Kathmandu airports might be developed as sub-regional air hubs. Other business centres, such as Pokhara-Paro (Bhutan), Biratnagar-Syedpur (Bangladesh), Pokhara-Lucknow (India), Bhairahawa-Patna/Bodhgaya, Bhairahawa-Kolkata, Kathmandu-Guwahati (India), and Dhaka-Guwahati could be explored as new destinations.

BBIN countries can leverage connectivity improvements and opportunities to develop value chains for their welfare gains. Medical tourism in recent years has shown increasing trends of being intraregional, and India has emerged as a major medical tourism destination, with Bangladesh as the leading source country. The rising demand for medical tourism can further the need for air connectivity in the BBIN sub-region.

The electronics value chain presents enormous potential for increasing BBIN's intra-regional trade. Since the outbreak of the COVID-19 pandemic, the concentration of Global Value Chains (GVCs) has increasingly become circumspect. India is set to benefit from this global move away from over-reliance on China in electronics manufacturing. This shift away from the over-concentration of electronics manufacturing and design in China presents an opportunity for the BBIN sub-region to integrate itself into GVCs.

Value chains in NER of India present business opportunities in Bangladesh, Nepal and Bhutan. An efficient logistics chain can help businesses in BBIN countries tap into the NER market and vice-versa. However, transportation links between Guwahati and other countries like Bangladesh and Myanmar are weak. Guwahati can be a hub for air, rail, and road connectivity within NER — it has direct air links with most NER state capitals and rail links with several states.

Air connectivity remains expensive and is faced with several barriers, including a lack of airport infrastructure, cargo handling facilities, and higher cargo freights. Airlines also need to operate more wide-bodied aircraft so that the air cargo volume can be scaled up. As the volume of air freight grows, there is a natural progression from passenger aircraft to chartered cargo planes of increasing size and ultimately to scheduled cargo services.

RMGs cargo from Dhaka to use the Kolkata airport will create road and air solutions and generate cargo demand. Allowing this and identifying other appropriate routes through which businesses can happen will support creating a cargo network. The solutions typically may involve having as much flexibility as possible for operations; therefore, flexibility, like entering from one border point and exiting from another, must be considered by the BBIN countries.

E-commerce can present an avenue for expanding the reach of air mode in express logistics. Presently, on account of the lack of logistics integration in the South Asian region, informal cross-border e-commerce takes place. However, with concerted efforts, this informal trade will become a formal channel of trade (Kathuria, 2020).

Developing such an integrated model in South Asia would require the countries to allow each other's vehicles into their territories. This will significantly improve the consumer welfare of the population on both sides of the border by making a wider variety of goods available at more competitive rates.

The BBIN MVA may serve as a potential framework for moving goods across borders seamlessly and thus spur cross-border trade. But, for trade to grow in the region, there need to be sound regulations and effective operations of customs.

Issues for further discussion

- There is a paucity of data on air-borne trade in the BBIN sub-region; therefore, to boost multimodal connectivity through air transport, the respective governments must release more data covering different facets of air-borne trade in the public domain.
- There is a need to develop international standard airports and aviation services that cater to cargo and passenger traffic.
- The surge of Low-Cost Carriers (LCCs) in the past decade has presented a dilemma for policymakers. Even though LCCs often do not compete in the freight market (unlike legacy or full-service carriers); they are frequently the main source of pressure on airports to build out their infrastructure (ADB, 2022). Overcoming this problem requires the development of separate terminals or airports for LCCs.
- With the economic rise of the entire region, there will be greater demand for express air transportation. Besides, expansion in the production or processing of higher-value products in each country will upturn the share of air connectivity in the intermodal transportation mix.

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