BRIEFING PAPER

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Railway Connectivity in the BBIN Sub-region and its Potential

Joining Dots • Connecting People • Shared Prosperity

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With defunct railway networks between India and Bangladesh being restored, Nepal's plan to connect its eastern side bordering West Bengal to its western side bordering Uttarakhand through the East-West corridor (also known as Mechi-Mahakali Railway), and the proposed extension of railway lines from Kokrajhar in Assam up to Gelephu in Bhutan, transport connectivity in the BBIN sub-region is up for a major transformation.

It has the potential to bring the sub-region closer, lead to transport and trade integration, and facilitate inclusive economic development across sectors and communities. This, however, calls for an enabling agreement similar to the Bangladesh-Bhutan-India-Nepal (BBIN) Motor Vehicles Agreement (MVA) signed in June 2015, though yet waiting for its implementation.

Significance of Rail Connectivity

Generally, transport networks and economic growth happen simultaneously. An efficient transport network is the key to sustainable development and can enhance economic growth[1]. However, the transport network has not kept pace with the growing demand in pursuit of higher economic growth. Infrastructural gaps are observed at each stage and sub-stage of the transport network[2] in most developing countries. The increasing carbon footprint of transportation and infrastructure projects is another issue faced by the developing world.

There is a need to make sustainable transport central to sustainable development endeavours, considering the positive linkages between transportation networks and economic development. It is now becoming imperative for the global value chains to re-orient and shift towards environmentally friendly and energy-efficient modes of transportation.

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Given its importance, the United Nations Sustainable Development Goals (SDGs) 2030 include sustainable transportation as an essential element (viz. SDG 11.2: Affordable and Sustainable Transport Systems). Railways, emerging as a major source of transportation, can play a significant role in achieving this goal.

The history of railways dates back several centuries. They were created to transport goods long distances and have evolved to transport passengers. It has evolved under different adaptations, including passenger railways, underground (or overground) urban metro railways and goods carriages. Moreover, it has emerged as one of the most dependable modes of transport in terms of safety. Trains are fast and the least affected by usual weather turbulences like rain or fog, compared to other transport modes.

The railway network has the inherent feature of carrying heavy freight across long distances cost-effectively. With an increase in containerised cargo shipment, the rail transport network can showcase its intrinsic characteristics and establish itself as an alternative sustainable, cost-effective, and energy-efficient mode of transport compared to shipping and long-haul road transportation. This is reinforced by the fact that each freight train can carry between 40 to 70 times the equivalent of lorry loads of goods in a much safer and more secure environment giving rail a distinct advantage.[3]

Evolution of Railway Networks in the BBIN Sub-region

Five countries in the South Asia region[4] share land borders, and BBIN countries, including Bangladesh, Bhutan, India, and Nepal, are among them. While the BBIN countries are distinguished with common ethnic and cultural heritage amenable for deeper economic and trade integration, potential benefits which can emerge through transport and trade integration are yet to be realised. Transport connectivity, particularly railway networks, can play a critical and much-desired role in realising this integration.

As far as the railway network in the BBIN sub-region is concerned, the first railway network in the BBIN sub-region was introduced by the British government in the 19th century in India.[5] In 1837, the first rail was operationalised from Red Hills to the Chintadripet bridge in Madras, and this railway was used to transport granite stones in Madras.[6] It was followed by the commencement of railways in now Bangladesh (then British India) in 1862 when a railway line was opened between Darshana, Chuadanga District and Jogotee, Kushtia District.[7]

In Nepal, the British government built the first railway during the Rana period in 1927. This railway line connected Raxual (British India) with Amleskhganj (Nepal)[8]. Bhutan, being a land-locked country with tough terrain, has not been able to establish any railway transport network yet.

Since its inception, significant progress has been made in terms of railway networks in India and Bangladesh.

Indian Railway, a government-owned enterprise, has emerged as the fourth largest railway system and freight carrier in the world, besides being the single largest employer in India and the eighth largest in the world. A total track length of 126,366 km over 67,956 km of the route and 7,335 stations enamour Indian Railways as it operates 13,523 passenger trains and 9,146 freight trains daily. During 2021-22,

the railways carried freight loads of 1418.1 MT, about 25 percent of the total freight carried in India. Indian railway aims to contribute about 1.5 percent to the country's GDP by building infrastructure to support 45 percent of the modal freight share of the economy by 2030.[9]

> *The size of Indian Railways can be understood from the fact that the total distance covered by the 13,523 trains daily on the Indian Railways equals three & half times the distance to the moon, and further full track length of Indian Railways can circle the equator one-and-a-half times.*

As in India, Railways in Bangladesh is a government-owned and managed organisation. Presently, it covers a length of 2955.53 route km and employs 25,083 regular employees.[10]

In its endeavour towards modernisation, Bangladesh Railways is guided by several documents and agreements with transport implications. At the national level, these include the National Land Transport Policy (NLTP)[11], Seventh Five Year Plan[12], the National Integrated Multi-modal Transport Policy (NIMTP)[13]; and Bangladesh Railways Vision Statement[14]. For railway connectivity beyond its borders, international agreements, such as the Intergovernmental Agreement on the Trans-Asian Railway Network[15] acceded to by the Bangladesh Government in 2007, BIMSTEC Master Plan for Transport Connectivity and the South Asia Subregional Economic Cooperation (SASEC) Operational Plan are its guiding forces.

Nepal and Bhutan are both at a nascent stage as far as railway infrastructure and connectivity is concerned. Nepal is, however, better placed compared to Bhutan, which has no rail connectivity, and roadways are the most important transport links. As mentioned above, the first railway in Nepal, a 39 km narrow-gauge railway line, connected Raxaul in British India with Amlekhganj in Nepal in 1927. It was followed by another 45 km narrow-gauge railway line between Janakpur to Jainagar in 1937.

In 1957, another rail link, named Koshi Railway, was built to carry stones and gravels near from Dharan and Chatara to the site of the Koshi Barrage. The rail line was linked with Birpur and Bhimnagar in the state of Bihar in India.

In 1965, the Raxaul- Amlekhganj link was closed following the opening of Tribhuvan Highway. Subsequently, this railway track from Raxaul was converted to a broad gauge by Indian Railways to connect Inland Container Depot (ICD) in Sirsiya (Birganj), Nepal. The line became fully operational in 2005.

Figure 1: Raxaul-Birganj/Sirisiya Rail Line with the Potential to Connect Kathmandu

The railway track between Janakpur to Bijayalpura (22 km railway line) on the Janakpur-Jainagar line was closed in 2001 following the washout of railway embarkment. The remaining portion of the railway line Janakpur-Jainagar was converted to a broad gauge in 2018. Further, the construction work has been completed until Bijalpura, and this line is extended to Bardibas (through Bijalpura approx. 21 km). Janakpur-Jainagar is the only active railway line in Nepal besides the 6 km Raxaul-Birganj/Sirisiya (ICD) line.

Figure 2. India-Nepal (Jainagar to Janakpur) Railway Line

In addition, the Bathnaha/Jogbani-Biratnagar Railway Line (18.6 km) is under construction. While nearly 71 percent (13.2 km) of this railway line is in Nepal, the remaining 29 percent (5.4 km) is in India.

The above shows that some progress has been made over the last few years. There is good scope and potential for spreading the railway network and infrastructure within and across the border in the

BBIN sub-region, the progress is sub-optimal. Non-physical challenges such as lack of political will, regulatory and legal issues, technological and operational issues, and inadequate planning and funding support are major obstacles that tend to hinder progress.

Technical challenges further compound these challenges. These include varying standards and specifications for rolling stock, signalling systems, data exchange, repair, maintenance and use of railway infrastructure, and break of gauge also need to be addressed to promote cross-border railway transport operations[16].

Enabling Factors for Railway Connectivity

The renewed focus on the rail connectivity network in the BBIN region is due to the railways being a climate-smart and climate-efficient solution for all. Reliance on the rail network for the movement of goods is an excellent way to reduce carbon emissions and fulfill the international commitments to reduce carbon footprint in the four countries and the sub-region. It is found that trains outperform passenger vehicles in greenhouse gas (GHG) efficiency, and railways are six times more energy-efficient than roadways and four times more economical.[17]

While numbers vary by source, trains produce only 11-27 percent of the CO2 cars produce per passenger km. The same holds for freight transport: trains produce less than 40 percent of the CO2 produced by trucks transporting the same tonnage of goods. In Europe, railways produce only 1.5 percent of the transport sector's GHG emissions, although they enjoy 8.5 percent of the total market share.[18] Finally, the cost of construction of railways is significantly lower than the cost of construction of roadways for a comparable amount of freight and passenger movement.

Railways provide an excellent platform for connecting South Asia to Southeast Asia. Various corridors, such as the BIMSTEC rail corridor, SASEC rail corridors, and Trans Asian Rail Network, are being pursued. Many of these are under development to facilitate trade and passenger movement between the countries.

Additionally, in the context of freight movement, the COVID-19 pandemic has adversely impacted all modes of transport, while the lesser impact was seen in the rail transport network. It is due to the distinct feature and capacity of the railway to transport larger volumes of cargo using less human resources over long distances and accordingly with fewer health checks.

The BIMSTEC Master Plan for Transport Connectivity underlines the importance of multidimensional connectivity, which promotes synergy among connectivity frameworks in the region as a key enabler to economic integration for shared prosperity.[19]

The Master Plan presents a comprehensive 10-year strategy and action plan for improving the subregion's transport linkages covering roads and road transport, railways and rail transport, ports and maritime transport, inland water transport, civil aviation and airports, multi-modal and intermodal transport, trade facilitation, and human resource development in the sector.

The SASEC Operational Plan (OP) 2016-2025, adopted by SASEC members in May 2016, involves a refocusing of operational priorities as reflected in an updated pipeline of projects in key sectors and areas of cooperation, namely transport, trade facilitation, energy, and economic corridor development.[20]

For the railway, the aim is to improve connectivity, focusing on (i) enhanced railway connections between Bangladesh and India, (ii) improved connectivity with landlocked countries and the northeast region of India and to seaports, and (iii) enhanced connectivity between ports and their hinterlands. There are two important railway networks in SASEC Operational Plan. These are (i) SASEC Railway Corridor 1: Nepal–India Trade Corridor; and (ii) SASEC Railway Corridor 2: India–Bangladesh Rail Corridor.

The Trans-Asian Railway Network is a regional transport cooperation platform aimed at enhancing the efficiency and development of the railway infrastructure in Asia.[21] It is a part of UNESCAP's overall goal to see the development of an international, integrated, intermodal transport and logistics system in the region, with the Asian Highway and Trans-Asian Railway networks and dry ports of international significance as significant components.

In addition to a sub-regional programme on railway connectivity, on the national side, India has launched PM Gati Shakti - National Master Plan for Multi-modal Connectivity, essentially a digital platform to bring 16 Ministries, including Railways and Roadways together for integrated planning and coordinated implementation of infrastructure connectivity projects. The multi-modal connectivity will provide integrated and seamless connectivity for the movement of people, goods and services from one mode of transport to another.

It will facilitate the last-mile connectivity of infrastructure and reduce people's travel time. The National Logistics Policy launched in India in October 2022, considered the soul of the Gati Shakti - National Master Plan for Multi-modal Connectivity, is expected to complement and provide much-needed impetus to the National Master Plan for Multi-modal Connectivity.

Similarly, Nepal has planned an East-West railway line, also known as the Mechi-Mahakali line, spanning across Nepal. The East-West corridor will start from Kakarvitta, Jhapa district and end at Mahendranagar, Kanchanpur district. It covers 24 districts and provides rail connectivity to the whole of Nepal. Implementation of this project is expected to facilitate public transport, generate employment opportunities and contribute notably to the national economy through concrete transport infrastructure. But, more importantly, it will push for sub-regional railway connectivity.

All these regional and national initiatives are aimed to realise a more integrated sub-region. These initiatives provide a road map for development and cooperation amongst the BBIN countries to integrate the railway line and facilitate seamless passenger and cargo movement in the sub-region.

Additionally, freight transportation through rail is vital for the BBIN countries, and the revenue generated from freight transportation is an essential component of reinvestment into the modernisation of railways. According to the Annual Reports & Accounts (2020-21) published by the

Indian Railways, it was observed that Indian railways generated INR 1.15 lakh crore through freight operations.[22]

Similarly, according to Grant Document 48 for the Ministry of Railways,[23] Bangladesh earned Taka 313 crore (INR 253 crore) in 2017-18 as earnings from goods' and/or parcels' transportation. Furthermore, it has been noted that revenue generated from freight transportation is often used to offset and subsidise the cost of passenger movement through the railway.

Finally, transportation through the railway network can potentially avoid many trade facilitation issues. Presently, the BBIN region has very low levels of containerized rail traffic. At the same time, the road network is almost wholly breakbulk cargo, and even most of the rail freight traffic uses breakbulk BCNHL wagons. But with increased rail, the region can achieve more significant containeriszed traffic. This will enable application of modern technologies such as e-seals, ECTS etc. This means no multiple border inspections and free pass-through at border points, and reduction in the land border congestion.

Box 1: Visakhapatnam Port Ideal for Nepal-bound Cargo

In 2016, Vizag (Vishakhapatnam) port was declared as second gateway port for Nepal after Kolkata-Haldia riverine port. The movement of traffic-in-transit between Port of Visakhapatnam and Nepal are in sealed containers and in full rake only with the cost of transhipment borne by the consignor/consignee.

Hence, third country transit containers to Nepal are not inspected in India. They are directly carried from Vizag port to Birgunj through rail. This has reduced the time and cost considerably for Nepal. This has resulted in two way traffic growth for both India and Nepal. India is benefitting by the Visakhapatnam port handling more traffic and hence high revenue, and Nepal is benefiting by low detention cost, demurrage cost and many other formal and informal charges, and easy access to export-import items.

Source: Compiled by the author from different sources

Cross-border Railway Connectivity in the BBIN Sub-region

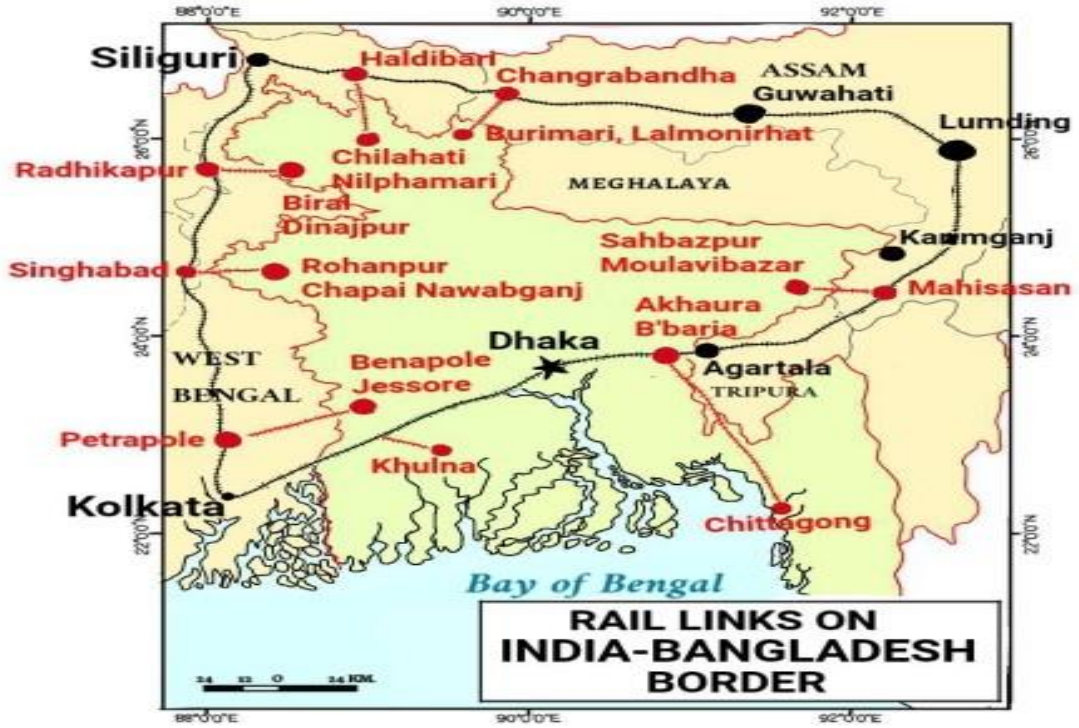
Apart from Bhutan, the BIN (Bangladesh-India-Nepal) region is connected with each other by at least one railway track running through the borders. In case of Bhutan's case, a feasibility study for the India-Bhutan railway has been completed. The project is expected to commence shortly up to the India-Bhutan border at Gelephu. The rail connectivity in the BBIN sub-region is primarily used to transport cargo between the sub-region. The land ports are situated in such a way that trade through rail can happen, making the land ports multi-modal.

India and Bangladesh

India and Bangladesh share more than 4000 km of the common border and historically had several railway linkages. Some popular railway linkages were Petrapole-Benapole, Gede-Darshana, Singhabad-Rohanpur, Radhikapur-Birol, Chilahati-Haldibari, Changrabandha-Burimari, Mahishashan-Shahbazpur,

and Agartala-Akhuara. Out of these, five railway linkages are currently operating between the two countries for passenger and freight movement, namely, Petrapole-Benapole, Gede-Darshana, Singhabad-Rohanpur, Radhikapur-Birol, and Chilahati-Haldibari. The Singhabad-Rohanpur and Radhikapur-Birol are used exclusively for freight movement.

Figure 3: Rail Links on the India-Bangladesh border



Source: Adapted from *Jaya Thakur, Department of Geography, Jadavpur University*

The Gede (India)-Darshana (Bangladesh) route was operationalised in 2008, with the Maitree Express starting its cross-border movement between Kolkata and Dhaka. It is noted that the freight service on the route began in 1972 after the independence of Bangladesh but more regularly after the two countries signed transport agreements in 1988. Major commodities through this route comprise stones, fly ash, de-oiled cakes, limestones, and boiled rice. The Gede–Darshana Gateway is unique as it connects India and Bangladesh to the broader Asian community through the Trans-Asian Railway Network, which provides an onward link to Southeast Asia through North-eastern India.

The Radhikapur (India)-Birol (Bangladesh) route was operationalised in 2005. However, it was suspended due to different gauges used in India and Bangladesh. The route was re-operationalised in 2017 and acted as a transit facility for goods from/to Bangladesh, India, and Nepal. Fertilisers from Bangladesh are sent through this route to Nepal.

The Singhabad (India)-Rohanpur (Bangladesh) route was operationalised in 2011. This is an active rail transit route. Apart from facilitating trade between India and Bangladesh, this route is used to transport cargo to/from Nepal and Bangladesh. The route allows the goods from/to Bangladesh and Nepal to reach their destination without transshipment. One of the goods exported through this route is fertilisers.

The Petrapole (India)-Benapole (Bangladesh) route was operationalised in 2001 for freight movement. Later, in 2017, it was operationalised for passenger movement. It is one of India and Bangladesh's most strategic and important trade routes. It is estimated that almost 70 percent of the trade between India and Bangladesh happens through this border point via rail and road. The railway linkage facilitates the trade of bulk items such as stones and fly ash between the two countries. Currently, trade through rail is one way, that is, from India to Bangladesh.

The Haldibari (India)-Chilahati (Bangladesh) route is the latest operationalised rail route between India and Bangladesh. It was suspended in 1965 and became operational in 2021. The railway link has facilitated the trade of stone chips between the two countries.[24]

Box 2: Bangladesh Railway earns 176 crore Taka carrying freight at India-Bangladesh borders

The Bangladesh Railway has earned record revenue of over 176 crore Taka by carrying freight through the India-Bangladesh interchange border points in 2020-21. This amount is 100 crore Taka more than the revenue earned in 2019-20.

As per reports, 1613 racks entered Bangladesh through the interchange points such as Rohanpur-Singhabad, Darshana-Gede, Benapole-Petrapole and Biraul-Radhikapur sections. These racks contained over 36.93 lakh metric tonnes of freight into Bangladesh, of which 93 were rice transport racks and 316 were wheat transport racks. During this period, Bangladesh Railways carried 2.15 lakh metric tonnes of rice and 7.67 lakh metric tonnes of wheat through the interchange points. Apart from rice and wheat, the Bangladesh railways also carried fuel, liquid medical oxygen, stone and gypsum.

Source: News Service Division, All India Radio, August 04, 2021

The goods transported between the two countries mainly comprise iron, steel, machinery parts, etc. For this, the rail route is considered less time-consuming and more organised.

Recently, the government of India and Bangladesh have been working on new routes that are different from historic routes between the countries, such as the Agartala-Akauhura rail link, Hili-Birampur rail link, and New Jalpaiguri/Rangapani-Banglabandha rail routes. These rail links are expected to take the burden off the already working beyond its capacity land ports. Moreover, as it would reduce the loading and unloading charges, road transportation charges and other charges incurred by the importers for the transportation of goods, it would be a cost-efficient method. Once loaded, the cargo will be unloaded at the nearest railway station to the importer’s warehouse or manufacturing unit.

The Changrabandha-Burimari rail link is one of the historic rail links between India and Bangladesh. The railway track on this route was uprooted in 1947. Currently, the trade is taking place through Changrabandha Land Custom Station and Burimari Land Customs Station, which is adjacent to the uprooted railway line. The Changrabandha railway station is just 0.5 km from the ‘zero-point’, while the Burimari railway station is 2 km away from this railway station. Therefore, India and Bangladesh can be connected through railway lines by restoring about 3 km of railway track.

Box 3: The Curious Case of Changrabandha

Changrabandha is a border town situated in Mekhliganj subdivision of Cooch Behar district in West Bengal at the India-Bangladesh border. The town has an operational land port custom station, an upcoming ICP, a railway station, and a defunct about 3 km railway line between India (Changrabandha) and Bangladesh (Burimari). Changrabandha Land Port is strategic as it is located at the Asian Highway (AH) 48 and is used by Bhutan for its trade with Bangladesh. Burimani also dons an operational land custom station and railway station.

However, the railway line became defunct after the India-Pakistan partition in 1947. The Changrabandha railway station's proximity to the Burimari railway station implies that India and Bangladesh can be connected by railway by restoring about 3 km of railway track.

Due to the defunct railway line, trade only takes place through road transportation. Every day, about 350 trucks cross the border, though the capacity from India is much more (the movement of more than 500 trucks can be managed as per local stakeholders). Goods such as stone chips, stones, hard rock, river stone, limestones, jute seeds, maize and wheat are being exported from Bhutan and India through this land port. At the same time, Bangladesh is exporting garments, melamine products, medicines, hosieries, caps, juice, chips and some other products to these two countries through Burimari land port.

There is a serious capacity constraint on the Bangladesh side. At the same time, there are also infrastructure-related issues on the Indian side. This land port suffers from a lack of parking facilities, inadequate customs and immigration facilities, and state government apathy in facilitating the development of this area. Local stakeholders termed this land port as '*exporters run land port*' as most of the infrastructure investment and support has come from the trader community.

Therefore, while an ICP is coming up here, there is also a need to revive and extend Changrabandha Railway connectivity up to Burimari Railway Station. This will give a huge boost to trade between the two countries and would also facilitate the transit of goods from Bhutan. This, however, calls for expediting the construction of ICP at this border point, the revival of the defunct railway line and its integration with the upcoming ICP.

The Memorandum of Understanding for constructing the 12.03 km Agartala-Akauhra rail link (India-5.46 Km, Bangladesh-6.57 Km) was signed in 2013.[25] The project completion has been divided into two stages: (i) Construction of Nischintpur Yard near the Indo-Bangladesh Border with the provision of Meter Gauge for receiving Meter Gauge trains from Bangladesh and vice-versa. This was completed in March 2021; (ii) the Viaduct portion with the provision of BG track for connecting Nishintpur (Meter Gauge) yard and Agartala Main station. This is expected to be commissioned in 2023.

The Agartala-Akauhra rail link would be part of the Agartala ICP and Akhuara ICP. This project includes the construction of an international passenger and cargo terminal at the railway station. The rail link is expected to reduce the time and shorten the distance between Agartala and Kolkata. Moreover, it would connect the Northeast region of India with Bangladesh and subsequently with Mongla and Chittagong ports. This will essentially serve as an excellent transport network for cargo from the

Northeast region and would also lower the transportation charges of trade within India if the cargo can pass through India-Bangladesh-India.

India-Nepal

Nepal has not made much progress in promoting and integrating railways as a dominant mode of transportation. There are several reasons for this, including the inadequate capacity to plan and execute railway network projects, difficult terrain, high costs of establishing and maintaining railways, and the country's sparse population. However, an increasing need is felt for railways connectivity for diversifying modes of transportation for passenger and cargo movement across the country. Additionally, due to the climate-smart nature of the railway, it is also felt that railways would lower the emission rate and, at the same time, increase the volume of goods transported.

Nepal government has recently established the Nepal railway company under the Department of Railway, Ministry of Physical Infrastructure and Transport. This will assist the Government of Nepal in planning and constructing the railway and other associated infrastructure. The company manages two railway lines: Raxual-Sirsiya and Jayanagar-Janakpur.

The Raxaul (India) - Sirsiya (Nepal) line is primarily used for freight movement. Sirsiya is a dry port or an Inland container deport in Nepal. It is a six-kilometre broad gauge line that became operational in 2005. The first private cargo train carrying 90 containers of food from India to Nepal reached Birgunj dry port in 2021.[26]

Box 4: India-Nepal Cooperation in Cross-border Railway Connectivity

India-Nepal cooperation in cross-border rail connectivity is premised on the Rail Services Agreement (RSA) between the two countries executed in 2004 for the introduction of freight train services between these two countries to and from Birgunj (Nepal) via Raxaul (India). The agreement provides for its periodical review every five years and its modification through Letters of Exchange by the Contracting Parties by mutual consent. Four amendments to the agreement have been made through LoE so far: first in 2004; second in 2008 (at the time of introduction of bilateral cargo between the two countries, which required the introduction of new customs procedures); third in 2016, enabling rail transit traffic to/from Visakhapatnam Port in addition to the existing provision of rail transportation through Kolkata/Haldia Port; and the fourth one in 2022 enabling all authorized cargo train operators including private container trains operators to carry Nepal's container and other freight.

Source: Ministry of External Affairs, Government of India/others

Further, in October 2021, during the 5th Joint Working Group (JWG) and the 7th Project Steering Committee (PSC) meetings, the two sides signed the Standard Operating Procedures (SOPs) for the start of passenger train services on the Jaynagar-Kurtha section and the Memorandum of Understanding (MoU) for Final Location Survey (FLS) of the proposed broad gauge railway line between Raxaul and Kathmandu.

In this regard, it is mentioned that the first and second phases of the project between Jayanagar and Kurtha and Kurtha and Bijalpura, respectively, have already been completed. The project's third phase between Bijalpura and Bardibas is delayed due to land acquisition issues and challenging terrain.

In addition, Nepal is also exploring other options for railway connectivity to facilitate cargo movement and take the pressure off its road network. Nepal is working on the East-West Rail Corridor, connecting Kakkarbhitta with Mahendranagar (read more at Box 5).

Box 5: The East-West Railway Line, Nepal

The plan of the 1024 km East-West corridor in Nepal is one of the most forward-looking transport initiatives of the Nepal Government, as it seeks to provide rail connectivity to the whole of Nepal by connecting 24 districts. The East-West corridor will start from Kakarvitta, Jhapa district and end at Mahendranagar, Kanchanpur district. Implementation of this project is expected to generate employment opportunities and contribute notably to the national economy through improved transport infrastructure.

Furthermore, it is envisaged to connect to all the Integrated Check Posts at the India-Nepal border. This will help in the seamless movement of goods and passengers across Nepal and facilitate trade. It will also help Nepal to better integrate into the sub-region as goods from different parts of Nepal can be transported in a cost-effective manner.

Figure 4: East-West Corridor, Nepal

Source: Office of the Investment Board, Department of Railways, Ministry of Physical Infrastructure & Transport, Government of Nepal

The East-West Corridor is proposed to be connected to various check posts at the India-Nepal borders, ensuring the seamless movement of passengers and goods within Nepal. One such rail link that will connect to East-West Corridor is the railway line between Bathnaha in India to Biratnagar in Nepal, passing through Budhanagar. It is mentioned that the rail line up to Budhanagar has been completed. Recently, the Indian delegation visited Nepal via train on the railway line constructed.

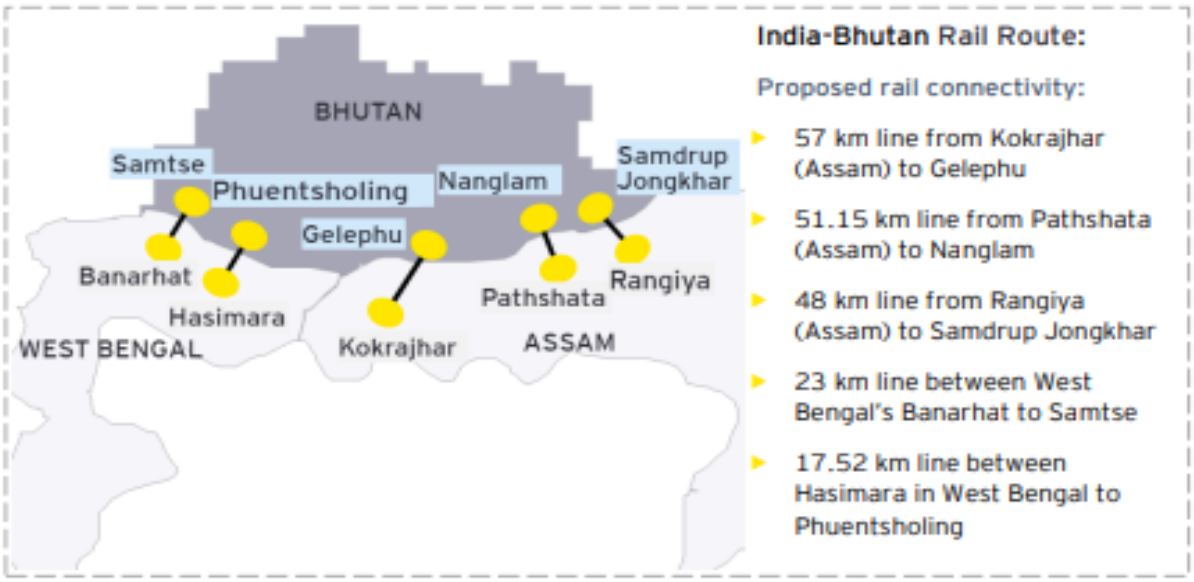
Further, the work is going on for the final location survey for rail links, New Jalpaiguri-Kakarbhitta, Nautanwa-Bhairahawa, and Nepalgunj Road-Nepalgunj. There are; however, some projects delayed for years. The construction of the Bathnaha Biratnagar railway link was started in 2011.[27] Despite more than a decade, as mentioned above, the construction of the rail link has not competed. There are land acquisition-related issues in Nepal's Biratnagar district. This link will connect the Biratnagar Integrated Check Post (ICP) to the East-West Corridor in Nepal and facilitate trade and passenger movement between the two countries. Recently, a part of the line from Jogbani ICP to Biratnagar ICP has become operational to assist in cargo movement.

India-Bhutan

Bhutan does not have an active railway network in the country. However, Bhutan is exploring the possibility of rail connectivity to boost multi-modal connectivity in the country and sub-region.

In 2005, an MoU was signed between the Government of India and the Royal Government of Bhutan to implement the rail connectivity project. As per the agreement, Indian Railways conducted studies for rail links between the Indian states of Assam and West Bengal with Bhutan. These include Kokhrajhar (Assam)-Gelephu (57.7 km), Rangia-Samdrup Jongkhar (48 km), and Pathshala-Nangalam (51.15 km) between Assam and Bhutan; and Banarhat-Samste (23.15 km) and Hasimara-Phuentsholing (17.52 km) between West Bengal and Bhutan.[28]

Figure 5: Rail Links on India-Bhutan Border



Source: Land Customs Station Evaluation Report, Land Ports Authority of India

The rail connectivity depicted on the maps are indicative and do not show actual route

In 2020, the Indian railways conducted a feasibility study for the rail link between Mujnai (West Bengal) and Nyoenpaling (Bhutan). However, no further updates on the issue were found before this study.

Recently, it was found that the Indian railway has undertaken an elaborate exercise to construct a broad-gauge line from Kokrajhar, Assam, in India, to Gelephu in Bhutan[29]. The 57.5 km-long Kokrajhar-Gelephu rail link is expected to serve the long need for rail connectivity between the two neighbouring countries.

Siliguri, a Potential Facilitator to Sub-regional Railway Connectivity

The Siliguri Corridor popularly referred to as Chicken's Neck is one of the most important locations in the sub-region, which has huge potential to integrate the BBIN countries through railways. It is a 22 km wide area connecting India with the Northeast India and serves as a gateway for Northeast India. It is of strategic and political importance to India as it is close to the neighbouring countries. The nearest Bangladesh border (Fulbari) is about 10.7 km, the Bhutan border is about 100 km (Jaigaon), and the distance from the Nepal border (Panitanki) is about 27 km.

The Siliguri area is already connected through various modes of transport and is well connected with the road transport network through national highways. The National Highway NH-31 connects Siliguri to Guwahati in Assam, one of the region's most critical highways. Additionally, 4-lane East-West Corridor passes through this corridor and connects Srirampur and Silchar in Assam, covering major industrial centres. The Northeast Frontier Railway caters to this region. The main railway station in Siliguri is the New Jalpaiguri Railway station. Siliguri is connected via airways as well, through Bagdogra Airport.

The New Jalpaiguri railway station serves as an International passenger terminal for passengers travelling by train between India and Bangladesh and is also used as a cargo terminal. The Mitali express between India and Bangladesh starts from this station and serves as the starting point for cargo trains between India and Bangladesh. Moreover, the nearby Indian stations, such as Rangapani, Mohitnagar, and Bagdogra, are also equipped with cargo handling facilities. This will help New Jalpaiguri station to distribute its load if required.

Due to its strategic location and proximity to all the other countries in the sub-region, several regional multi-modal transport master plans are being concentrated in and near Siliguri, such as SAARC regional transport study,[30] BIMSTEC, and ASEAN projects to integrate this region better.

Bangladesh-India-Nepal/Bhutan Rail Link

The New Jalpaiguri railway station in Siliguri has the potential to work as an enabler of the regional railway connectivity network. Recently, the Bangladesh Government proposed the construction of a railway station and dual gauge railway line at Banglabandha of Panchagarh district.[31]

Completing this project is expected to take burden off Mahananda Bridge over Mahananda river, and facilitate seamless cargo movement from the Banglabandha land port to the rest of Bangladesh. There

is also scope to connect Banglanbandha railway station to the Indian railway line at Rangapani Railway Station or New Jalpaiguri Railway Station.

This will facilitate the cargo movement between and among countries in the sub-region and goods from Bangladesh can be easily transported to all the major Indian cities and neighbouring countries. Furthermore, under the BIMSTEC Master Plan for Transport Connectivity, a flagship railway project is proposed to connect New Jalpaiguri to Kakarbhitta. It will be a 46 km stretch and provide Nepal with multi-modal transport options to transport cargo to other regions of India.

Similarly, the rail link between Kokhrajhar (Assam)-Gelephu (Bhutan), a 57km stretch proposed under the BIMSTEC Master Plan, also provides Bhutan with multi-modal transport options to transport cargo to major states of India.

Table 1: Planned Flagship Projects to Provide Rail Connectivity for Landlocked Member States

Project Description	BIMSTEC Development Logic	Estimated Cost, 2018 ($ million)	(Possible) Funding Sources	Timescale
Bhutan				
Development of (i) Kokhrajhar (Assam)-Gelephu (Bhutan) (57 km), (ii) Pathsala (Assam)-Nanglam (Bhutan) (51 km), (iii) Rangiya (Assam)-Samdrupjongkhar (Bhutan) (48 km), (iv) Banarhat (West Bengal)-Samtse (Bhutan) (23 km), and (v) Hasimara (West Bengal)-Phuentsholing (Bhutan) (18 km)	Project to provide Bhutan with intermodal transport options	To be estimated	India	2019-2028 and beyond
Nepal				
Development of (i) Jaynagar-Bardibas (69 km, including 3 km in India and 66 km in Nepal), (ii) Jogbani-Biratnagar (19 km), (iii) Nepalganj- Nepalganj Road (12 km), (iv) Nautanwa-Bhairahawa (15 km), and (v) New Jalpaiguri-Kakarbitta (46 km)	Project to provide Nepal with multi-modal and intermodal transport options on more routes to Kolkata (and onward to other BIMSTEC countries)	900+	India	2018-2025 the first two (sub) projects are ongoing

Source: BIMSTEC Master Plan for Transport Connectivity, December 2020

As indicated in Table 1, several rail projects with implications for sub-regional connectivity are in the pipeline and are expected to be completed in the next few years. The existing and upcoming rail link through Siliguri and its geographical location make it an ideal place to act as a freight and passenger movement corridor for railway linkages between and among the BBIN countries. The railway connection between Bangladesh, Bhutan, and Nepal can be easily accessed through the New Jalpaiguri station. Additionally, the cargo movement through rail will ease the corridor's choke-up, enabling BBIN countries to trade efficiently and smoothly in a cost-effective manner while being resilient and climate-conscious.

Conclusion and the Way Forward

Reinforced by multilateral initiatives such as BIMSTEC and SASEC Programs to promote rail connectivity, a common approach and thinking are emerging between and among the BBIN countries to work collectively to strengthen railway connectivity. In this regard, while India and Bangladesh have made good progress, Nepal, a landlocked country, appears to be a laggard, and Bhutan, another landlocked country, is a non-starter.

There are several reasons for this, including a lack of regional planning and mapping of railways' potential as a mode of transportation, the low capacity of landlocked countries and huge fund requirements, and varying rail gauges. Another major issue is the lack of absence of any sub-regional arrangements such as the Bangladesh-Bhutan-India-Nepal (BBIN) Motor Vehicles Agreement (MVA) which can work as a binding force in the case of railways.

The following initiatives may be considered to address the issues highlighted above. Firstly, considering inadequate capacity and huge fund requirements, multilateral agencies such as the World Bank and Asian Development Bank should come forward to prioritise and support critical projects with implications for sub-regional connectivity. Fortunately, under BIMSTEC Master Plan for Transport Connectivity and SASEC Operational Plan, relevant projects have already been identified, and these need to be completed in time.

Secondly, it is imperative that BBIN member states adopt a common approach to sub-regional rail connectivity through coordinated planning and action. This calls for raising awareness among stakeholders on ongoing and proposed railway development plans and projects at domestic and sub-regional levels.

Thirdly, the BBIN countries should consider entering into a similar arrangement such as BBIN MVA, which is yet to be implemented. The existing bilateral rail service agreement between India-Bangladesh and India-Nepal should be broadened in their scope and may be upgraded into a comprehensive regional rail agreement. A database at the sub-regional level may also be set up to facilitate the member states' exchange of railway planning data for coordinated investments.

Finally, to address the issue of varying rail gauges, BBIN countries could also consider adopting a variable gauge system, enabling railway rakes to run on tracks of different gauges. Under this system,

as a train passes, the wheels are unlocked and moved closer or further with subsequent re-locking. Such systems exist between Spain and France, Sweden and Finland, Poland and Lithuania, Ukraine and Poland, and many others. This will, however, require establishing a coordinated system involving border clearance agencies, particularly for ensuring transshipment capacity and its execution at specific border points.

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