

Importance of transport infrastructure development in Arunachal Pradesh along the Line of Actual Control

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The development of transport infrastructure in India's easternmost state Arunachal Pradesh, which shares 1080 kilometre-long disputed border with China, assumes significance in the context of the country's security interests and economic development of this isolated region. In the wake of China's growing aggression and hegemony that were well demonstrated during the recent border conflict in Ladakh, the improvement of Arunachal's transport infrastructure has become all the more necessary. This paper seeks to analyse the Centre's current transport infrastructure projects, including roadways, railways, airways, bridges and inland waterways to improve connectivity in the frontier state. The major focus of the paper is to evaluate both state and central government's efforts to address the twin challenges facing Arunachal—security and development, against the backdrop of China's massive infrastructure development in Tibet. An attempt has also been made to recommend policy measures regarding the improvement of Arunachal's transport infrastructure to attain sustainable development and ensuring India's security and territorial integrity. The primary and secondary source data have been subjected to a rigorous test of content analysis.

Keywords: Transport infrastructure, strategic projects, Chinese expansionism, development, environment, LAC, security and territorial integrity

Introduction

Improvement of infrastructure in India's easternmost border state Arunachal Pradesh, which shares 1080 km-long border with China, assumes significance in the context of the country's security interests and economic development of this isolated region. Even after attaining statehood in 1987, Arunachal has remained one of the most inaccessible parts of India for many years. The state is connected with rest of the country mainly by road and to a limited extent by rail. Recently, the state has also

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been added in the country's civil aviation map. However, there are still some areas particularly along the international borders that could only be reached by foot.

The Centre cannot ignore the transport infrastructure requirements of this mountainous border state where China claims nearly 90,000 sq km calling it "Southern Eastern Tibet". India's long-standing border disputes with China, its growing aggressiveness and expansionist tendencies in the context of the border conflict in Ladakh and rapid up gradation of border infrastructure in Tibet continue to worry New Delhi's policy makers and security establishment. Responding to repeated Chinese incursions into Arunachal and its attempts to build road on the Indian side of the Line of Actual Control (LAC), the Centre has accelerated the pace of infrastructure development in the sensitive border state.

The paper seeks to analyse the importance of the development of transport infrastructure of Arunachal such as roadways, railways, airways, bridges and inland waterways in the view of the growing Chinese aggression along the LAC. The major focus of the paper is to evaluate the central government's efforts to address the twin challenges facing Arunachal—security and development against the backdrop of China's massive infrastructure development in Tibet and the recent Sino-Indian border conflict in Ladakh. Moreover, the paper tries to analyse the challenges facing the transport infrastructure development projects. An attempt has also been made to recommend policy measures regarding the improvement of Arunachal's transport infrastructure for sustainable development and ensuring India's security and territorial integrity.

During the last one decade, several projects have been proposed or undertaken to develop transport infrastructure and promote tourism in this picturesque region inhabited by numerous ethnic groups. Arunachal has suffered for long due to the absence of proper road connectivity. It may be added that the state has a meagre density of 25 km per 100 sq km as against an all India average of 142.7 km per 100 sq km area. However, in the last six years, there has been a visible transformation in the state owing to the Centre's push for transport infrastructure development.

Expansion of roadways

The Union Ministry of Road Transport and Highways (MoRTH) has taken up several ambitious schemes in Arunachal to build all-weather roads, bridges and robust infrastructure. In its efforts to accentuate the pace of project implementation, the MoRTH initiated a Special Accelerated Road Development Programme for North East (SARDP-NE) for development of road networks in the region¹.

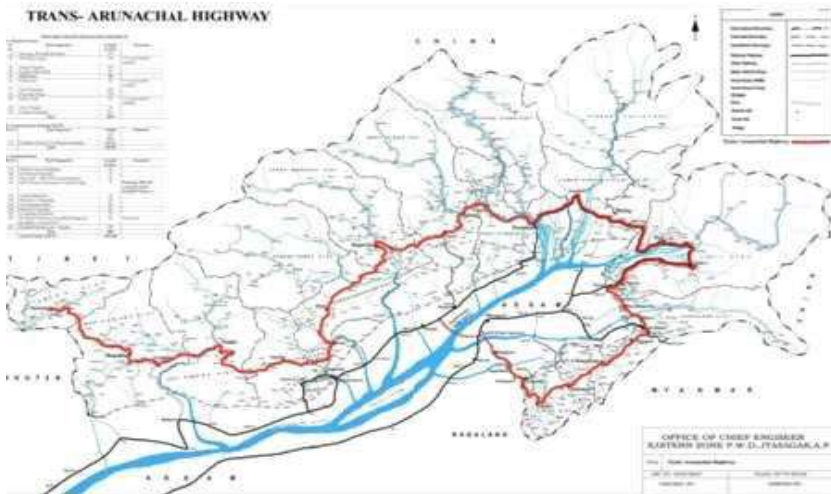
The building of road networks throughout the length and breadth of the frontier state of Arunachal has been given priority by the National Democratic Alliance (NDA) government. The MoRTH has entrusted the task of implementing the road projects in Arunachal to various government agencies, including Border Roads Organisation (BRO) under the Ministry of Defence (MoD), National Highway Authority of India and newly created National Highways (NH) and Infrastructure Development Corporation Limited. Besides, several private construction companies have been engaged in the execution of road projects².

Some of the major ongoing and proposed road projects in Arunachal include Trans Arunachal Highway (NH-229), Arunachal Frontier Highway, Jamuguri to Holongi (NH-52), Hukanjuri-Khonsa (NH-315A), Itanagar-Banderdewa (NH-415), Holongi-Banderdewa Road, Lalpul-Manmao-Changlang Road, Longding-Tissa-Khonsa Road, Khonsa-Hukanjuri (NH-315A), Pasighat-Pangin (NH-229), Akajan-Likabali-Bame Road, Hunli-Anini (NH-313), Joram-Koloriang (New NH-713), Demwe-Brahm Kund (New NH-113) and Arrowa-Khupa-Hayuliang (New NH-113).

The Arunachal government has also stepped up efforts to improve road connectivity to bring about faster development in the state. Both short and long term plans have been formulated under the Cabinet Committee on Infrastructure for robust transport infrastructure development of Arunachal. The state government seeks to upgrade roads in the districts and provide road connectivity to additional deputy commissioner (ADC) and sub-divisional headquarters across the state. Under the Five-Year Road Plan, the Arunachal government has taken several measures to upgrade all the existing inter-state and inter-district roads to state highway specifications by 2024. Moreover, a number of initiatives are currently underway to ensure connectivity to the remote and far-flung areas to boost tourism industry³.

Trans-Arunachal Highway

The two-lane Trans Arunachal Highway (TAH) covering a distance of 1,841 km linking Tawang at the north-western end of Arunachal to Kanubari at its south-eastern tip, and finally connecting NH-52 near Akajan is a strategic highway project on the northern bank of the Brahmaputra. The TAH will inter-connect 12 out of 23 district headquarters of the state. The project is being funded and implemented by the Centre under the SARDP-NE at an estimated cost of Rs 20,239 crore. The people of Arunachal believe that the highway will add tremendous fillip to the state economy, particularly agriculture, horticulture and tourism. It will also help locals during medical emergency⁴. A map showing the alignment of the TAH is given below:



Source: Government of Arunachal Pradesh

Despite the efforts of the Centre for speedy completion, this mega project has been facing numerous obstacles. The execution of the TAH Project at several segments has virtually stopped or been proceeding very slowly. On March 9, 2015, the then Public Works Department (PWD) Minister Gojen Gadi told the state assembly that the delay in implementation was mainly due to compensation issue with the affected people and lengthy process of final forest clearance by the Union Ministry of Environment, Forest and Climate Change (MoEFCC)⁵. Earlier in September 2014, the NDA government decided to ease norms to build this highway and military facilities along Arunachal's border with China. The TAH is scheduled to be completed by March 2027⁶. Once the TAH becomes operational, it will serve as a lifeline to the people living in remote and isolated districts of Arunachal.

Current status of the ongoing road projects

Over the last six years, Arunachal's ongoing road projects have been reviewed periodically by the state government and MoRTH and efforts are being made to fast-track the projects. It has been found that in some segments of the TAH, the construction work is proceeding reasonably well, while in most others, it has stopped due to various problems⁷. The 407 km-long Potin-Pangin Road, which is a part of the TAH, has also been confronting numerous hurdles especially in Lower Subansiri district⁸.

In a major boost to Arunachal's road connectivity, the then MoRTH Minister Nitin Gadkari on January 14, 2017 inaugurated four highway projects, including four-lane Itanagar-Hollongi and two-lane Papu-Yupia-Hoj-Potin. The new Itanagar-Hollongi Highway is the state's first four-lane highway. The 20 km-long highway connects Itanagar to Hollongi, and reduces travel distance between Itanagar and Guwahati by nearly 60 km⁹. On January 30, 2018, the BRO achieved a major milestone in Arunachal's remote Upper Subansiri district by opening a strategic road connecting Tama Chung Chung with Bidak along the LAC. The building of this "operationally critical road" was undertaken by the BRO under its Project Arunak¹⁰.

In another significant development on October 12, 2020, Union Defence Minister Rajnath Singh laid the foundation stone for the 450 metre-long two-lane Nechipu tunnel on the road to Tawang. Once constructed, the tunnel will ensure all-weather connectivity from Tezpur in Assam, which is the logistics base of the Army, to Tenga Valley across the Nechipu Pass as well as providing a safe and secure passage through accident-prone areas¹¹.

Earlier in May 2017, the Arunachal government requested the MoRTH to notify four state roads as national highways at the earliest. They include: Akajan-Likabali-Bame (120 km), Margherita-Changlang (44 km), Daporijo-Gerukamukh-Dullungmukh (125 km) and Tezu-Sunpura-Chapakhowa (59 km). The MoRTH agreed in principle to declare these roads as national highways. The state government also reviewed some of the projects facing various hurdles including Lalpul-Manmao-Changlang, Longding-Tissa-Khonsa, Khonsa-Hukanjuri, Itanagar-Banderdewa and Nechepu-Seppa-Sagalee-Hoj¹².

Arunachal Frontier Highway (AFH)

The Centre is also focusing on improving road connectivity along the LAC. On

October 14, 2014, the then Minister of State (MoS) for Home Affairs Khiren Rijiju announced that the NDA government has planned to build an Arunachal Frontier Highway (AFH) from Mago-Thingbu in Tawang to Vijaynagar in Changlang district. The proposed road will run parallel to McMahon Line. He noted that the AFH through the rugged and hostile terrain would be constructed at an estimated cost of Rs 50,000 crore and take about five years to complete¹³. Subsequently, the MoD had also cleared the proposed strategic highway project after changing its alignment in two segments, namely, Mago to West Kameng and Tuting-Singa-Anini¹⁴. Finally on January 14, 2017, Gadkari announced MoRTH's approval of the much awaited AFH¹⁵. A map showing the alignment of AFH is given below:

Arunachal Frontier Highway



Source: Tribune India

The AFH Project has gained momentum recently after the state government took the initiative of bringing all the armed forces, BRO, and other stake holders on the same page for a coordinated approach to build the highway through the ecologically fragile eastern Himalayan region¹⁶. In January 2020, the Arunachal government informed that survey and investigation work has been completed and construction is about to begin soon¹⁷.

The proposed AFH, which covers the entire state from its easternmost part to the westernmost point, would bolster India's position vis-à-vis China in terms of border infrastructure. The highway will not only provide strategic advantage to the Indian security forces to keep close watch on the activities of Chinese troops and facilitate smooth movement of troops and supplies to the armed forces deployed at remote border outposts (BoPs) in sub-zero temperatures; but also assist in containing migration of native border population by offering them much needed connectivity.

East-West Industrial Corridor Highway

In its attempts to promote industrial development, the Arunachal government has taken up an ambitious project called East-West Industrial Corridor Highway connecting the state's eastern and western regions. A highway will be constructed along the foothill areas of Arunachal from Bhairabkund, the trijunction of Assam, Arunachal and Bhutan, to Ruksin in East Siang district. The 966 km-long highway will be passing through nine districts of the state. The 274.20 km length of the project includes roads existing NH standard from Pasighat to Manmao in Changlang district. The remaining 692.58 km length has been planned to be constructed in two phases. The 545.45 km-long phase-I begin from Pasighat and terminate at Bhairabkund, while the 147.15 km phase-II start from Kanubari in Longding district and ends at Tirap Gate¹⁸.

In 2015, the MoRTH agreed "in principle" to fund the project as a state highway, provided the state government completes pre-construction activities like forest clearance, land acquisition and techno feasibility study along with the detailed project report (DPR). At present, the entire length of the phase-I is in DPR stage, while survey and investigation work of phase-II is in progress. The Arunachal government is pushing the project and the chief minister told the assembly on March 4, 2021, that the construction of the proposed two-lane corridor highway would be taken up with the union government soon¹⁹.

Once the corridor becomes operational, it will bring about a sea change in the state economy particularly in the areas like agriculture, horticulture, tea and bamboo¹⁷. It may be noted that the corridor will pass through the regions which are potentially richest in sectors like agriculture, horticulture, fisheries and other cash crop cultivation. The alignment of the corridor along the foothills of a strip bordering Assam has enough potential for establishing fruit processing and packaging industries and various other units because of its close proximity to a big market in Assam¹⁹.

The Arunachal government is focusing on developing the corridor highway as the pivot of industrial activities. The state government has introduced financial and administrative reforms and adopted an industrial policy to make the state investment-friendly. Reports say a special desk will be created for Arunachal for investment under Invest India. The state is looking for investment in agriculture and horticulture-based and non-polluting industries²⁰. There are also plans of building healthcare and educational hubs along the highway. However, the project has already triggered controversy raising ecological issues and is yet to get clearance from the MoEFCC.

Challenges facing the road projects

For the last six years, the NDA government has been trying to improve connectivity in the land-locked and peripheral Arunachal. Despite all efforts to upgrade transport infrastructure, the execution of the projects has been sluggish in Arunachal. This was pointed out by North East based business leaders who had undertaken on the spot assessment of the ongoing road projects in different parts of the region in June 2018. Besides, Arunachal government officials voiced concern over the uneven pace of highway projects highlighting the dismal infrastructure in the Indian side vis-à-vis

neighbouring areas of China²¹. The highway development in Arunachal is not seamless due to numerous factors including slow land acquisition procedure, lengthy environment and forest clearance process and poor performance of the government agencies and contractors. While the construction of the TAH made considerable progress in the western part of Arunachal, a number of problems have slowed down the pace of implementation of road projects in the eastern parts.

Some of the other problems confronting the transport infrastructure development projects of Arunachal include: difficult terrain, incessant rainfall, rampant corruption, ecological issues and resource crunch. A number of retired army officers, who were posted in Arunachal, have noted that building roads in the mountainous areas of the state is a difficult task and time “consuming process”. Due to unstable geological conditions, roads are to be maintained continuously²². Excessive rainfall in Arunachal impedes the progress of work of the infrastructure projects. Recurrent flooding of the state’s major rivers during monsoon renders construction work virtually impossible for 6-7 months. Heavy rainfall results in repeated landslides and ground sinking making the task difficult for workers and causing delays in transportation of construction materials and equipments. This is a common scenario observed in the hilly regions leading to delay in execution of the projects and escalation of their cost.

The people of Arunachal are also worried about the rising corruption in the ongoing road projects and lackadaisical approach of the government agencies and private contractors who have been engaged in their execution. They believe that short longevity and poor condition of the roads are largely the results of rampant corruption and lack of sincerity on the part of contractors and government agencies. The BRO, a government agency that builds roads in India’s bordering areas including Arunachal, has been facing fund constraints for quite some time²³.

Recently, a big scam relating to the TAH land compensation issue has been revealed. Reports say, on July 3, 2018, the Special Investigation Cell (SIC) of Arunachal Pradesh Police arrested two retired state government officials and a businessman for their alleged involvement in awarding compensation to false owners of land acquired for the 30 km TAH segment from Joram to Koloriang in Lower Subansiri district²⁴. It is not uncommon in Arunachal where the political leaders and state government officials siphon off major part of the central government funds released for infrastructure development projects.

In addition to these, there is an environmental dimension of the problems faced by the ongoing road projects of Arunachal. Some environmentalists and geologists have expressed concern that that in the process of fast-tracking the projects, environmental norms were by-passed leading to landslides in a few areas of the state. In one such incident on July 11, 2017, fourteen people were reportedly buried alive near a highway project at Lapatap village in Papum Pare district. Experts blame mega development projects and urban expansion for the scale of damage²⁵.

The environment activists of Arunachal are also opposed to the industrial corridor highway project as it will pass through the core areas of the Pakee Tiger Reserve (PTR) to connect Seijosa in Pakke-Kessang district with Bhalukpong in West Kameng district. The project’s DPR prepared by a Gujarat-based consultancy firm has proposed an elevated corridor which will pass through the 40 km stretch from Seijosa to

Bhalukpong. Reports say the PTR's divisional forest officer (DFO) raised objections and suggested an alternative route be taken up instead one laying through the heart of the forest, citing the Forest Conservation Act (FCA), 1980, and the Wildlife Protection Act, 1972. It is pertinent to note that the DPR was drafted using satellite imageries, not on ground assessment in consultation with the state forest department²⁶.

The DPR is emerging as the centre of controversy even though it has mentioned the merits of an elevated corridor which include minimum conflict between the road users and the wildlife, free movement of animals, 24-hour traffic movement and enhancement of tourism. Besides, the DPR says that extra fencing shall be erected along the road other than underpass or bypass section to restrict trespassing and unauthorized entry into the core area. However, recent reports suggest that the MoEFCC has referred the road project proposal to the National Tiger Reserve Conservation Agency for its response due to the risks the project may pose to wildlife. The environment activists and wildlife scientists argue that the proposed road will adversely impact the local people as well as the bio-diversity of the park²⁷. They are enraged that Arunachal's Bharatiya Janata Party (BJP) government had neither taken the local people into confidence nor consulted a renowned conservation organisation before deciding to take up such a mega project. Arunachal's prominent environment activist Tana Jorjo Tara had filed a petition in the National Green Tribunal in 2018 opposing the project via the PTR²⁸.

Construction of strategic bridges

The construction of strategic bridges is an integral part of transport infrastructure development process. In the recent years, Arunachal's road connectivity has partly improved following the opening of a number of bridges over Brahmaputra, Lohit, Subansiri, Dibang, Digaru Deopani and other rivers. These bridges are constructed under the SARDP-NE. Arunachal's connectivity issue has been addressed to a great extent after the opening of some strategic bridges including Lohit, Dhola-Sadiya and Bogibeel.

Bridges are essential for Arunachal as several rivers and their tributaries and innumerable nallahs flow through the frontier state. The bridges provide much needed connectivity to strategic roads situated along the LAC and boost local economy. Monsoon wrecks havoc every year in many parts of Arunachal particularly along the Indo-China border disconnecting them from the rest of the country due to flash flood and landslides. Reports say nearly 150 strategic bridges have been built or are under construction in Arunachal to ensure all-weather connectivity to the frontier areas. Besides, they will serve as alternative routes if one is destroyed in a conflict with China²⁹.

In the wake of the border conflict in Ladakh, the Arunachal government has stepped up efforts to expedite the strategic transport infrastructure projects in the border areas. On July 16, 2020, the state government officials held an important meeting with the BRO resetting the timelines of the ongoing projects³⁰. Earlier on July 7, Defence Minister Singh held a review of the progress of infrastructure projects of the BRO which is currently engaged in the development of strategic roads and bridges in Arunachal under its four projects³¹.

The BRO is constructing 410 bridges of strategic importance for improving connectivity to the 3440 km-long LAC from Ladakh to Arunachal. Among them, as many as 144 bridges are in Arunachal. Reports say 75 out of 144 are under construction and some of them have been made operational in 2020³². In a major boost to India's security, Defence Minister Singh inaugurated eight strategic bridges in Arunachal on October 12, 2020. They include: Yasong and Sarri in Anjaw district, Karteso Kong and Kangdang Sila in Shi-Yomi, Tanchen Panga in West Siang, Ungu in Upper Subansiri, Siang in East Siang and Sigit in Upper Siang district³³. The operationalisation of these bridges will meet the transport and logistics needs of the armed forces throughout the year.

In another significant development on April 20, 2020, Arunachal Chief Minister Pema Khandu inaugurated a 430 feet-long bailey bridge at Daparijo over the Subansiri river. The strategic bridge was constructed by the BRO despite the nationwide lockdown and the impending threat of Corona virus pandemic. It will facilitate transportation of heavy military equipment to about 3000 troops deployed along the LAC and quick mobilisation during emergencies at two disputed areas in the region, namely, Asaphila and Maza. Furthermore, the bridge will ensure supply of essential items to more than 600 villages in the region throughout the year and future infrastructure development needs of Upper Subansiri district³⁴.

Earlier on January 18, 2019, the then Defence Minister Nirmala Sitharaman inaugurated the Diffo (Chipu) Bridge at Roing. The 329 metre-long bridge will help smooth movement of troops and supplies from Lower Dibang Valley to Upper Dibang Valley district which shares international border with China. Besides, it will enhance economic prosperity for people of Lower Dibang Valley, Namsai, Lohit and Anjaw districts of Arunachal³⁵.

Reports suggest that the Sisar Bridge between East Siang and Lower Dibang Valley district is almost ready. The bridge along NH-52 will vastly improve connectivity between western and eastern parts of Arunachal. Once it becomes operational, the people of Arunachal could move freely from Pasighat to Itanagar and eastern towns such as Roing, Tezu and Namsai without touching Assam. It will also enhance mobility of troops and logistics from East Siang district's military installations like Rayang and Sigar to Tuting military station in Upper Siang district³⁶. Besides, it will bolster India's defence preparedness at the Kibithu sector in the Indo-China border under Anjaw district that witnessed Chinese aggression in 1962. Moreover, the bridge is likely to boost tourism in Anjaw district which is well known for its natural beauty.

The long-awaited Lohit Bridge was opened for light vehicles on January 5, 2017. The 2.9 km-long bridge on the mighty Lohit is a strategic bridge that will vastly improve connectivity to the sensitive Walong sector of the LAC³⁷. One more strategic steel suspension bridge over the Siang at Kodak near Tuting was made operational on February 17, 2017. This bridge is located just 30 km from the LAC. The lack of connectivity in Tuting sub-division of Upper Siang district had forced many people to migrate to urban areas. According to reports, this bridge will also help to promote tourism in the areas as Tuting is a major take-off point for white-water rafting expeditions that the state government has been pushing for the last few years³⁸.

Again on December 12, 2017, the then union MoS for Defence Subash Bhamre inaugurated the 300 meter-long Deopani Bridge. The bridge has been built over the Deopani River in the Roing-Hunli Road and it connects Lower Dibang Valley to Upper Dibang Valley with East Siang and Assam. The operationalisation of this bridge assumes significance as these two districts of Arunachal lose link with other during the monsoon period. The bridge is also vital from the security perspective. It provides much needed connectivity to further north to Mipi and Dembuen at the LAC. The Injupani Bridge between Roing and Paya in Lower Dibang Valley district is the second one inaugurated by Bhamre on the same day³⁹.

The Dibang Valley is connected to neighbouring Lohit district by ten bridges. Among them, nine have been upgraded and the remaining one will be ready soon. The Lohit Bridge connects Tinsukia with Lohit and Anjaw districts and their surrounding areas. The Upper Siang district, which shares border with China, is situated on the eastern side of this region. Twelve bridges from Pangin to Gelling located at the LAC are currently under construction. There are twelve more bridges between Aalo and Yorlung in West Siang district. Located further east of Siang district is Daporijo, which too has equal number of bridges towards the LAC. In Tawang district, there are about 15 bridges under construction from Balipara in Assam to Tawang⁴⁰.

According to reports, two more bridges had been made operational in remote areas of Arunachal along the Indo-China border. In 2017, a single 200 feet bailey bridge across the tumultuous Subansiri River in Upper Subansiri district was opened for traffic. The BRO has constructed the bridge on the strategic Tama Chung Chung (TCC)-Bidak Road under its Project Arunak, which is a scheme to connect the inhospitable terrain of the state with the main roads. Another bailey bridge over the Dadu Siko River connecting TCC with the Taksing Road in Upper Subansiri district was opened recently⁴¹.

The much awaited 7.5 km-long bridge over the mighty Dibang River is almost complete barring some minor works⁴². The bridge will connect Lower Dibang Valley district with Lohit, East Siang, West Siang and Assam. It would usher a new era of economic growth as Dambuk in Lower Dibang Valley district is famous for its vast agri-horticulture potentials. Besides, it would ensure better market linkage to benefit the farmers as well as boost tourism especially adventure tourism⁴³.

In another significant development on May 26, 2017, Prime Minister Modi opened the Dhola-Sadiya Bridge to boost connectivity, trade and development and facilitate movement of troops and military logistics between Upper Assam and eastern Arunachal. The 9.15 km-long bridge, built over the mighty Brahmaputra and its tributary Lohit, is the longest in India. The bridge will be a game changer for the region in terms of connectivity. It connects the remotest parts of Assam's Tinsukia and Arunachal's Lohit, Lower Dibang Valley and Upper Dibang Valley districts. The bridge will immensely benefit the people of Arunachal in many areas, including healthcare and education (Bhattacharjee 2017).

It will also make transportation of heavy machineries meant for the power projects cheaper and faster. Arunachal's hydro-power potential is estimated to be 60,000 MW, which is the highest among the Indian states. The state's major river systems—

Kameng, Subansiri, Dibang, Siang, Lohit and others are considered ideal for hydro-power generation by the experts. Several big companies and public sector units are keen to tap Arunachal's vast natural resources. A major factor behind the Centre's approval of the strategic project has been its potential to boost the power sector of Arunachal. Furthermore, the bridge will help promoting tourism in Arunachal's inaccessible areas such as Mayodia, Bismaknagar and Dong (Bhattacharjee 2017).

From the standpoint of national security, the bridge will provide strategic advantage to India and logistical support to the Indian Army in the border region where China has already developed state-of-art infrastructure. It will facilitate transportation of heavy military equipment to the forward areas⁴⁴. The Indian Army had been demanding the construction of the bridge for long. In the absence of the bridge, the troops had to undertake more than 10 hours of stressful journey on boat to reach eastern Arunachal. The bridge will fortify Arunachal's far flung areas bordering China by facilitating smooth movement of troops and weapons. Security experts maintain that it will also provide a new route to reach Anini; the headquarters of Upper Dibang Valley district, and shorten the road journey to Walong, located further east of Anini and separated by a mountain range (Bhattacharjee 2017).

In another important development on December 25, 2018 Prime Minister Modi inaugurated the much awaited Bogibeel Bridge across the Brahmaputra near Dibrugarh in Assam. The Bogibeel is also a strategic infrastructure project. The 4.94 km-long bridge is the longest road-cum-rail bridge in the country and only second in whole Asia. The bridge will significantly contribute towards improving connectivity between Assam and Arunachal and enhance India's defence capabilities. The bridge connects Dibrugarh on the south bank of the Brahmaputra to Silapathar in Dhemaji district on Assam-Arunachal border both by road and rail. With the opening of the bridge, the road distance from Dibrugarh to Itanagar has been reduced by 150 km and rail travel distance by 705 km (Bhattacharjee 2019).

The operationalisation of the Bogibeel Bridge is a game changer in terms of expanding railway connectivity especially in the northern bank of the Brahmaputra and Arunachal. It provides much needed connectivity between the two existing railway networks in the southern and northern banks. The bridge has established links between Dibrugarh and the Rongiya-Murkongselek section in the north bank. It has reduced the train journey from Dibrugarh to Naharlagun to less than 100 km. The bridge is all set to galvanise economic development of the isolated and backward regions of eastern Assam and Arunachal. Reports suggest that it will benefit about 5 million people in the two states in sectors like trade, agriculture and tourism (Bhattacharjee 2019).

The Indian Army has long been demanding early completion of this important bridge. Some factors like the military debacle of 1962, inhospitable terrain of the region and absence of proper infrastructure on the Indian side of the LAC have compelled New Delhi's policy makers to take up gradation of transport connectivity across North East on an emergency basis to facilitate supplies to the troops, ensure timely re-enforcement in a crisis situation and help India to counter China's massive infrastructure building exercise on the other side of the LAC. The bridge will resolve the logistical challenges of the Indian armed forces stationed along the LAC in

Arunachal. It has been a strategic move to address the long standing transportation problem facing the Indian Army to get supplies from its Dibrugarh and Tezpur bases to the LAC (Bhattacharjee 2019).

Introduction of railway

In its bids to address the problem of infrastructure bottleneck of Arunachal, the Centre has undertaken several new railway projects in the state to connect with the existing rail networks of Assam. Arunachal for the first time figured in the railway map of India with the introduction of a passenger train between Harmuti and Naharlagun on April 7, 2014⁴⁵. Thereafter, Prime Minister Modi during his visit to the state on February 20, 2015, flagged off two long distance passenger trains—Naharlagun-New Delhi Weekly AC Express and Naharlagun-Guwahati Daily Intercity Express. A Shatabdi Express has also been running between Naharlagun and Guwahati since May 7, 2018⁴⁶. The opening of railway service has generated huge interest among local population, traders, construction companies and tourist agencies.

The Northeast Frontier Railway (NFR) has been making efforts in the last few years to connect some of the major towns and peripheral areas of the state with rail links. The Centre intends to extend the railway network northwards to Tawang bordering China and eastwards to Tezu which is not far from India-Myanmar-China trijunction. Reports say there are 11 railway projects in the state under different stages of implementation. They include: Bhalukpong-Tenga-Tawang (198 km), North Lakhimpur- Bame-Aalo-Silapathar (247.85 km), Pasighat-Tezu-Parshuram Kund-Rupai (225 km), Itakhola-Seijosa (18 km), Dumduma-Simaluguri-Namsai-Chowkham-Wakro (96 km), Dangri-Roing (60 km) Deomali-Naharkatia (20 km), Lekhapani-Kharsang-Miao-Nampong-New Kamlang-Deban (75 km), Tinsukia-Kanubari-Deomali-Lekhapani-Jairampur-Kharsang-Miao-Diyun-Tezu-Bhismaknagar-Roing-Dambuk-Pasighat (300 km), Margherita-Deomali (31 km) and Murkongselak-Pashighat (26.15 km)⁴⁷. A map showing the proposed railway lines of Arunachal is given below:



Arunachal's upcoming railway lines (Source: Indian Strategic Studies)

Recent reports suggest that the final location surveys of some of the proposed railway projects have been completed. The Ministry of Railways (MoR) has attached priority to the three strategic railway lines—Bhalukpong-Tawang, North Lakhimpur-Silapathar and Pasighat-Rupai. These proposed lines will vastly improve connectivity to northern and eastern regions of Arunachal as well as accelerate the pace of socio-economic development of the people⁴⁸. The surveys for the three lines, which will be used mainly by the military, were undertaken by the MoR after the Doklam crisis. They are identified by the National Security Secretariat as strategic projects and are being funded by the MoD to strengthen the country's defence in the border state of Arunachal. In November 2019, the central government reportedly approved the construction of these rail links⁴⁹. The state government too seeks speedy implementation of these railway projects.

The Tawang rail project is very significant from the viewpoint of national security. Given the strategic location of Tawang district on the Indo-Bhutan-Tibet trijunction, the project will be implemented on a priority basis. The 198 km-long ambitious railway line has been designed to reduce the travel time as the existing road distance from Bhalukpong to Tawang is about 300 km. This railway project will be one of the toughest and highest in the country. The laying of track through the rugged mountains is a challenging task. One unique feature of this strategic project is that, 177 km (out of 198 km total length) will pass through tunnels. The proposed 27 km railway tunnel crossing Se La Pass, once completed, will be one of the longest tunnels in India. Defence Minister Singh during his visit to Tawang on November 14, 2019, informed that the Centre had approved the construction of this tunnel⁵⁰.

Tawang, which is situated at a height of nearly 10,000 feet along the LAC, is of great strategic importance to India. China claims it as part of "South Eastern Tibet" and repeatedly objects to any visit by top Indian and foreign leaders, officials and diplomats to the area. The strategic Bumla Pass on the Indo-Tibet border is only 37 km away from Tawang town and an important meeting point between the Indian Army and the PLA occupying Tibet. It was also one of the regions in Arunachal where the Indian Army had to confront the onslaught of the PLA in the 1962 border war. On November 8, 2019, the foundation stone for the NFR's camp was laid at Tawang. Once the land acquisition process and other formalities are completed, the rail project is likely to be ready in six-seven years⁵¹.

Recent reports suggest that the survey work for the Pasighat-Rupai project is in progress, while the track laying work for the Lakhimpur-Aalo-Silapathar rail link is currently underway. The Murkongselek-Pasighat rail project has been halted since 2017 due to problems over compensation for land identified for acquisition. The NFR has noted that it will take three years to complete the project once the land acquisition issues are resolved. The Arunachal chief minister assured the state assembly on March 3, 2021, that the state government would urge the MoR to fast-track the project⁵².

The MoR is reportedly planning to build at least five more railway links for boosting national security in the sensitive border state. They include: Parshuram Kund-Walong, Pasighat-Tuting, Bame-Aolo-Kamba-Kaying-Tato-Mechuka, Pasighat-Roing and Roing-Tezu-Chowkham. Some of them have strategic significance and once

implemented, they will be railheads nearest to the LAC facilitating faster movement of troops and military logistics to the forward areas. These rail links are also important for stimulating economic growth in eastern Arunachal⁵³.

Upgradation of airfields and Advanced Landing Grounds (ALGs)

As part of the push for infrastructure development especially civil aviation in North East, the union government has decided to build new airfields, terminals and flight gateways in the region. Arunachal is one of the major focus areas of the government. As the state shares long border with China, there are eight Indian Air Force's (IAF) Advanced Landing Grounds (ALGs) which are being upgraded to enhance military capabilities and facilitate civil operations from those⁵⁴. A map showing 8 ALGs of Arunachal is given below:

Arunachal's ALGs



Source: Centre for Air Power Studies

Due to vast territory and difficult topographical features, Arunachal is very much dependent on helicopters and air service especially during monsoon to meet its connectivity requirements. Arunachal's eight ALGs, namely Aalo, Pasighat, Mechuka, Walong, Ziro, Vijaynagar, Tawang and Tuting remained unused for a long period. The state government entrusted the task of renovating these ALGs to the MoD in 2009. Among them, the first six ALGs have already been made operational, while the rest two are currently in different stages of up gradation⁵⁵. The ALG at Mechuka in West Siang district was expanded and made operational in April 2017⁵⁶. Earlier in March 2016, the up gradation of Ziro and Aalo ALGs was completed. It was a significant step towards enhancing the operation capability of the IAF⁵⁷.

The renovation of the Ziro ALG would enhance air connectivity in the state. The operationalisation of ALG at Aalo in West Siang district also assumes significance as West Siang district shares border China⁵⁸. The Walong ALG in Anjaw district, which was abandoned after the 1962 border conflict, was reactivated on October 23, 2015.

The strategic location of Walong ALG would be a launching pad for air operations and also facilitate administration in the management of border areas. Moreover, the ALG will provide air support in responding to natural calamities, evacuation, humanitarian assistance and supply of equipment and ration to troops stationed in far flung areas⁵⁹.

In a major development on September 18, 2019, the strategically important Vijaynagar ALG, situated in the country's easternmost tip in Arunachal's Changlang district, was reopened⁶⁰. This ALG will facilitate quick mobilisation of troops and transportation of supplies to the LAC. Moreover, the operationalisation of the ALG will galvanise economic development of the remote Vijaynagar area and facilitate movement of locals. The ALG at Tawang is currently undergoing up gradation. Chief of Air Staff Air Marshall RKS Bhadauria during his visit to Arunachal on January 6, 2021, held discussions with the state government for building ALGs at Dirang and Anini⁶¹. The state government wants one more ALG at Koloriang to be used along with a new one at Sogyatse in Tawang district. But the Centre may not consider the second proposal due to topographic challenges and adverse weather conditions⁶².

In November 2019, the Centre approved the construction of a Greenfield airport at Hollongi near Itanagar. The airfield is currently under construction and the Ministry of Civil Aviation (MoCA) has set 31 March, 2022, as the deadline to complete it. Earlier on September 30, 2018, the MoCA announced that entire Arunachal would be linked with aviation services in the next ten years. Under the regional connectivity scheme Ure Desh Ka Aam Nagarik (UDAN), small and big towns in the state would be connected with helicopter and commercial flights. Chief Minister Khandu announced that under Chief Minister's Air Connectivity Scheme, all ALGs in the state would be made operational for air services connecting them with Itanagar, Tezu and Pasighat airports⁶³.

In another development on April 23, 2018, Alliance Air, ATR-42 landed successfully at Pasighat ALG following its renovation as part of a test flight, paving way for operation of commercial flights⁶⁴. The renovation of the strategically located Tezu airfield in eastern Arunachal's Lohit district is reportedly progressing well and is expected to be made operational in May 2021. Besides, the Airport Authority of India has taken up the up gradation of Daparijo airfield⁶⁵. Responding to the new security challenges triggered by the Ladakh face-off, the IAF in January 2021 has assured the Arunachal government of all support for airway service, including providing defence pilots to meet the shortage for operating fixed-wing civilian aircraft in the state⁶⁶.

Development of waterways

Arunachal's major river systems like Dibang, Lohit, Subansiri and Siang flow through the hilly terrain of the state and then enter the plains of Assam and finally meet Brahmaputra. These rivers are often used by the people of Arunachal for transportation due to typical topographical features of the state bordering Assam. It is imperative that these rivers are developed for navigation purpose for the benefit of the people. The Dibang river is used for ferry services by the local people⁶⁷.

Currently, ferry services are carried out only by country boats. As part of up gradation of waterways in Arunachal, the state government could introduce mechanized boats which will save considerable time for the movement of cargo and passenger. The state government could also consider up gradation of ferry services over the Lohit river. Another major river of Arunachal Subansiri has huge potential for inland navigation. At present, the local people use country boats for marketing in the plains of Assam. The waterway is also used for commercial purpose for transporting timber, log, firewood and bamboo from Arunachal to the plains of Assam from July to September.

The Siang is navigable from Pasighat to Brahmaputra confluence near Kobo (Assam). It will be hugely beneficial for the people of Arunachal if the existing waterways are up graded and connected to the Brahmaputra which has been declared as National Waterway No 2. In November 2018, the chief minister said that state government is exploring possibility of developing floating terminals on the major rivers like Dibang, Lohit and Siang in collaboration with Inland Waterways Authority of India⁶⁸.

Infrastructure development in border regions: China vis-à-vis India

India's protracted border disputes with China and its increasing display of hegemony and aggression since the Doklam crisis have made the task of infrastructure building in the frontier regions of Arunachal a challenging one. Both the countries have long been trying to assert authority in the disputed areas by means of infrastructure building. In this competition created by history, geography, economic and strategic issues, China is much ahead of India (Borah 2017). China asserts that the entire area of Arunachal is a component of "South Eastern Tibet" as it exercised uninterrupted rule over Tibet. Moreover, China does not recognise the McMahon Line on the pretext that it was a "colonial imposition" (Mukherjee 2019).

There are also differences over the interpretation of the LAC, marking the border between the two countries. The Chinese troops and officials often intrude into the Indian side of the LAC resulting in tension and diplomatic scuffle between the two countries. In an incident in the last week of December 2017, Chinese personnel crossed the LAC and began road construction in Arunachal's Upper Siang district. According to a report, the Chinese team advanced about 1 km and the Indian troops subsequently confiscated the team's construction equipment and pushed it back. The incident occurred four months after the Doklam crisis even though the issue was finally resolved in meetings⁶⁹.

Following its victory in the 1962 border conflict, China had been aggressively pursuing strategic infrastructure development programmes on its side of the international border as part of the long-term plan to establish firm control over Tibet Autonomous Region (TAR). In a recent development on December 31, 2020, China completed track-laying work of a 402 km-long strategically-important high altitude railway line connecting Tibet's capital Lasha to Nyingchi, which is situated right on the top of Arunachal. It starts from Chengdu, capital of Sichuan province and passes through Ya'an, and enters Tibet via Qamdo, reducing the journey from Chengdu to Lasha from forty eight hours to thirteen hours. The construction of the rail link started

in 2014 and is likely to be operational in June 2021⁷⁰.

The state's twin challenges: Development and security

The security and development issues are intertwined in a key border state like Arunachal. The union government has made it clear that India wants to resolve the lingering border disputes with China through bilateral negotiations without compromising the country's vital security interests and infrastructure development of the border regions. Though a relatively peaceful state, Arunachal's key predicament so long has been the lack of proper infrastructure facilities. Like other states of North East, the development process has stagnated in Arunachal in the absence of proper transport infrastructure. Arunachal's Chief Minister Khandu often laments that his state's development has suffered primarily due to connectivity deficit even though it has abundant natural resources⁷⁶.

The development of transport infrastructure of this mountainous border state has become all the more necessary against the backdrop of China's growing attempts to unilaterally change the LAC. India is concerned about China's seemingly unending intrusion attempts into its territory, the latter's continuous efforts to push boundaries and militarise the surrounding areas through gigantic road and communication networks. According to a report, China has planned to construct more military infrastructure in the TAR with surveillance facilities focusing on India (Lone 2015).

During the May-June 2020 bloody border conflict in Ladakh, the PLA troops intensified their activities opposite Arunachal's Tawang and Walong sectors of the LAC. Reports suggest that they had been reinforcing their posts in large numbers, increasing patrolling and border transgressions in the wake of the Ladakh crisis⁷⁷. It is also alarming that the Chinese troops have stepped up surveillance along Arunachal's border villages in Lohit and Anjaw districts. This was revealed from the capture of Chinese spy-pigeons in the recent months. This new phenomenon assumes significance as Indian villages on the border are usually considered a second line of defence since inhabitants inform the Indian Army or local police when sighting anything unusual in the area⁷⁸.

These developments pose direct threat to India's territorial integrity and security. China's hegemonic designs and growing aggressiveness demonstrated during the Doklam crisis and recently in Ladakh are wakeup calls to India's defence planners. Beijing's persistent resistance to New Delhi's efforts to upgrade transport infrastructure close to the disputed international boundary has complicated the matters further. However, responding to repeated Chinese incursions into Arunachal and its attempts to build road on the Indian side of the LAC, the Centre has accelerated the pace of infrastructure development in the sensitive border state. While responding to Beijing's "concern" over New Delhi's plan to construct a frontier highway in Arunachal, the MHA affirmed that India has all right to create critical infrastructure in its area⁷⁹.

The Arunachal government is worried about the growing activities by the PLA across the LAC since the Ladakh standoff and has been pushing for better connectivity to mountainous border areas to facilitate faster movement of troops and military logistics during a war-like situation and provide the locals more accessibility. The

government is also wary of China blocking foreign funds for Arunachal's transport infrastructure projects. Leading global donor agency like Asian Development Bank (ADB) offers loans at cheaper interest rates that have benefited several Indian states including in the North East. However, China's interference has denied Arunachal such loans from the ADB⁸⁰.

The infrastructure development in the border regions could also boost transnational economic linkages as Arunachal had maintained trade links with neighbouring Bhutan, Tibet and Myanmar. The Arunachal government has urged the Centre to revive the historic Stilwell Road connecting Changlang district with Yunnan province of China through Indo-Myanmar Patkai range and revitalise Old Silk Route through Tibet and open Indo-Bhutan trade through Tawang. Direct trade with Bhutan is crucial for Arunachal as the state faces problems due to frequent transport blockade and agitation in Assam. Like most of the North Eastern states, Arunachal heavily relies on Assam for rail, road and air links to the rest of the country (Bhattacharjee 2015).

However, India's unresolved border disputes with China have stood in the way of developing trans-border connectivity through Arunachal and enhancing trade with neighbouring countries. China's longstanding claims over Arunachal's vast territory and the PLA's growing aggression along the LAC has deterred India's policy makers to promote a sensitive border state like Arunachal in the Act East Policy. Unlike other North Eastern states, Arunachal's security and development issues are different due to its peculiar geographical setting and close proximity to a hegemonic power like China. The deteriorating Sino-Indian relations resulting from the border conflict in Ladakh has retarded the prospect of developing trans-border trade links through Arunachal.

Policy recommendations

(a) The state government must streamline land acquisition procedures involving a number of strategic road and rail projects. In view of the increasing Chinese incursions into various parts of Arunachal, both state and union governments should fast track the TAH and AFH projects. Besides, the transport infrastructure of the border district of Anjaw, where Walong sector is situated, has to be improved without further delay. The mountainous terrain of this area, which bore the brunt of the PLA aggression in 1962, impedes quick mobilisation of troops and supplies to the LAC.

(b) The government also must do away with the lengthy process of forest clearance by the MoEFCC. However, it has to be ensured that the environmental norms are not bypassed while fast tracking the projects as it often leads to landslides in several places of Arunachal. The delicate ecological balance of Arunachal's should also not be disturbed while implementing infrastructure development projects as the state has enormous potential for tourism owing to its breathtaking landscapes, fauna and flora.

(c) In order to harness the vast potential of Arunachal's agriculture, horticulture, agro-forestry and tourism sectors, the state government should address the ecological issues for speedy implementation of the industrial corridor highway project with the concerned union ministries. The government also has to mitigate the challenges facing

other road projects. To develop an effective market chain for horticulture and agro-forestry products, improvement of connectivity across Arunachal is the need of the hour.

(d) The government must find early remedy of myriad challenges facing the transport infrastructure development projects including poor performance of the government agencies and private operators, growing corruption in the road projects especially related to land acquisition, fund constraints and escalating cost of the projects. In order to bolster India's defence preparedness along the LAC, the union government should devise an institutional mechanism for coordination among its concerned ministries to expedite strategic road, rail and bridge projects.

(e) Given Arunachal's immense potential of tourism to boost the state's economy, connectivity to remote and far-flung areas is immediately required. The state government should initiate awareness campaign highlighting the importance of creating congenial atmosphere for tourism industry to flourish and make the state investment-friendly. It has also been observed that the ruling elites of Arunachal often indulge in blame game over the state's territory under Chinese occupation and try to gain political mileage whenever an incursion occurs. It is imperative that the state's governing elites eschew from such acts for political expediency and instead focus on directing all efforts to strengthen India's security and accelerate the pace of socio-economic development of Arunachal.

(f) There is a need to develop strong partnership between the armed forces and the local people to boost security and development. The state government has long been demanding for more recruitment of local youth in armed forces and regular organising of recruitment rallies in Arunachal. It has also urged the MoD to set up Sainik School, Himalayan Mountaineering Institute and revitalise Rajya and Zilla Sainik Welfare Boards. Moreover, due to the abundance of fresh fruits and vegetables in Arunachal, the government has been advocating for sourcing of Army supplies of such items from Arunachal Cooperative Societies. This will add fresh impetus to the rural economy of the state⁸¹.

(g) The union government should also expedite the up gradation of the two remaining ALGs particularly Tawang for quicker transportation of materials and military personnel along the LAC during emergency and develop Arunachal's waterways linked to the Brahmaputra for cheaper transportation of goods and passenger to boost the state's economy. Moreover, the strategic rail projects of Arunachal should be fast-tracked. The inter-linking of Brahmaputra's northern and southern banks through railways and expansion of network in the northern region up to the forward areas along the LAC will be game changer in terms of mobilisation of armed forces and materials in larger scale in an emergency situation.

(h) The Centre must address the Indian Army's serious concern over the tardy progress of the strategic infrastructure development projects in Arunachal. A number of former army officers underscored the urgent need of upgrading transport infrastructure along

the Sino-Indian borders especially in the Arunachal sector. They have clearly noted that unless the armed forces could move freely in the border areas, it would be difficult to defend the country's territory⁸². In view of China's renewed hostility and expansionist designs, India has no option but to speed up such projects to protect its territorial integrity and sovereignty and resolve border disputes through diplomatic means.

Conclusions

Building of transport infrastructure in the mountainous region of Arunachal is undoubtedly an arduous task and the ongoing Covid-19 crisis has further compounded the process. In addition to such constraints, the state's infrastructure development projects have been facing two major challenges, namely, rampant corruption and violation of environmental norms. Arunachal, which cannot mobilise local resources for a variety of reasons, is heavily dependent on Centre's funds for all development activities. However, a section of Arunachal's political leaders in connivance with greedy government officials misappropriate funds sanctioned for development projects. Along with money laundering, which has been persisting for several years, growing malpractices in settling land compensation cases have impeded the implementation of connectivity projects across the state.

In order to change the development paradigm, the political leadership of Arunachal has to reinvigorate internal governance, contain corruption and build synergy among all stakeholders. The need of the hour is to construct robust transport networks throughout the state and create an investment-friendly atmosphere. It is equally important to address the ecological issues confronting the connectivity projects and protect Arunachal's wildlife habitat to ensure sustainable development. The state's diverse ethnic groups have coexisted peacefully with its rich bio-diversity. Therefore, it is essential that Arunachal's development priorities are adjusted to the prevailing status quo.

Given Arunachal's low density of roads and its strategic location, the improvement of connectivity has become all the more necessary after the Ladakh border conflict. China's unusual aggressive behaviour and attempts to unilaterally change the status quo along the LAC by violating the existing bilateral agreements designed to maintain peace and tranquility in the border regions, pose direct threat to India's sovereignty and territorial integrity. This is indeed an alarming situation for Arunachal that shares a long disputed border with China. Considering the fast deteriorating security scenario, the Centre should make all possible efforts to bridge the gap between India and China in the domain of transport infrastructure development especially in the frontier areas of Arunachal. India's decision makers have to push the strategic connectivity projects in Arunachal despite China's persistent resistance to such endeavours. It remains to be seen how Beijing will react when the actual construction of two ambitious connectivity projects—AFH and Tawang railway, begin.

Endnotes

1. The major objectives of the SARDP-NE is to provide connectivity to backward and remote areas of North East, upgrade national highways to two/four lane, improve

- roads of strategic importance and establish connectivity with neighbouring countries.
- See “Centre gives nod to 6,148 km of road construction in Arunachal Pradesh”, *The Times of India*, 11 December, 2013, Accessed 13 September, 2019, <https://timesofindia.indiatimes.com>CityNews>Economy>.
2. “Border’s An Infra-Push Away”, *Outlook India*, 19 August, 2017, Accessed 16 May, 2019, <https://www.outlookindia.com>Magazine>International>.
 3. See Sharma, Anup, “Centre clears tunnel, railway link projects to Tawang”, *North East Now*, 14 November, 2019, Accessed 22 March, 2021, www.nenow.in>Arunachal>TopNews; and “Work on Arunachal Frontier Highway will start soon”, *The Business Standard*, 4 January, 2020, Accessed 19 March, 2021, www.business-standard.com>...>National>News.
 4. See “Trans Arunachal Highway project to be completed by 2021”, *Daily Excelsior*, 23 October, 2017, Accessed 7 September, 2018, <https://www.dailyexcelsior.com>National>; “Trans-Arunachal Highway to be completed before 2018”, *The Business Standard*, 22 November, 2015, Accessed 6 June, 2019, <https://www.business-standard.com>News>ANI>National>; n. 1; and n.2.
 5. “Govt planning road along McMohan line in Arunachal Pradesh”, *Livemint*, 14 October, 2014, Accessed 18 March, 2015, <https://www.livemint.com>Politics>nqEwdXxklrSHPgts2sFRN>Govt>.
 6. See “India to build 1800-km highway along China border in Arunachal”, *The Indian Express*, 16 October, 2014, Accessed 18 March, 2015, <https://indianexpress.com>India>IndiaOthers>; “Only 100 km of 2400-km Trans-Arunachal highway built so far”, *The Hindu*, 5 February, 2013, Accessed 15 September, 2019, <https://www.thehindu.com>News>National>; and n. 4.
 7. On February 19, 2016, the then MoS for Home Affairs Khiren Rijju, presided over an infrastructure development meeting and reviewed several ongoing road projects in West Kameng district, including TAH, Balipara-Charduar-Tawang (BCT), Orang-Kalaktong-Shergaon-Rupa-Tenga (OKSRT), Munna-Chander-Thungri, Dirang-Mandala-Debrabu-Naga GG and Shergaon-Morshing-Mandelephudung. See “Discussion over East-West Industrial Corridor in Arunachal Pradesh”, *Northeast Now*, 4 July 4, 2018, Accessed 12 September, 2019, <https://nenow.in>NORTHEAST NEWS>.
 8. *Ibid.*
 9. “Nitin Gadkari promises more roads worth Rs 50,000 crore to Arunachal Pradesh”, *The Indian Express*, 14 January, 2017, Accessed 7 September, 2018, <https://indianexpress.com>India>.
 10. “BRO builds strategic road in remote Arunachal Pradesh district”, *The Times of India*, 16 February, 2018, Accessed 15 September, 2018, <https://timesofindia.indiatimes.com>India News>.
 11. The tunnel will provide a direct link between the plains of Tezpur and the Tenga Valley where one of the forward divisions of the Army is located. Tawang is about 200 km away from the Tenga Valley and is connected by roads through the rugged mountains of Arunachal that are perennially foggy and prone to landslides. See Dutta, Amrita Nayek, “Rajnath inaugurates 44 bridges in border areas—8 of them in Ladakh amid LAC standoff”, *The Print*, 12 October, 2020, Accessed 17 March,

- 2021, <https://theprint.in/defence/rajnath-inaugurates-44-bridges-in-border-areas-8-of-them-in-ladakh-amid-lac-standoff/522001/>.
12. “Arunachal Pradesh CM reviews status of highway projects”, *The Business Standard*, August 10, 2018, Accessed 7 September, 2018, <https://www.business-standard.com>.
 13. See n. 5.
 14. The MoD has proposed to use the existing TAH from Tawang to Dirang instead of Mago to West Kameng. From Dirang the road would pass through Thongri, East Kameng, Kra Daadi, Kurung Kumey, Upper Subansiri, West Siang, Upper Siang, Anini, Anjaw and finally Vijaynagar. For the other section from Tuting to Anini, the MoD had pointed out that it would be time consuming for which it was decided that from Tuting the road would go through Yingkiong and Pasighat to connect Anini. See “Arunachal Pradesh: Road project from Tawang to Vijaynagar approved, says Kiren Rijiju”, *The Indian Express*, 21 September, 2016, Accessed 7 September, 2018, <https://indianexpress.com>India>Donot use India news>.
 15. See n. 9.
 16. Karmakar, Rahul, “Arunachal Pradesh Chief Minister Pema Khandu pushes for highway along Tibet border”, *The Hindu*, 22 November, 2020, Accessed 19 March, 2021, www.thehindu.com>News>National.
 17. “Arunachal launches ground works on 2,000-km frontier highway”, *NBM & CW*, 10 January, 2020, Accessed 19 March, 2021, www.nbmcw.com>news>arunachal-launches-ground.
 18. “Arunachal Pradesh To Build 966 km Long Highway Connecting Eastern and Western Corners of the State”, *Swarajya*, 5 March, 2021, Accessed 17 March, 2021, <https://swarajyamag.com/news-brief/arunachal-pradesh-to-build-966-km-long-highway-connecting-eastern-and-western-corners-of-the-state>.
 19. See Nag, Devanjana, “Arunachal Pradesh to soon take up East-West Industrial Corridor Highway project with Centre; details”, *The Financial Express*, 5 March, 2021, Accessed 17 March, 2021, <https://www.financialexpress.com/infrastructure/roadways/arunachal-pradesh-to-soon-take-up-east-west-industrial-corridor-highway-project-with-centre-details/2207024/>; and n. 18.
 20. See “Work on Arunachal Frontier Highway will start soon”, *Business Standard*, 4 January, 2020, Accessed 19 March, 2021, www.business-standard.com>...>National>News; and n. 16.
 21. “Patchy pace of North-East highway projects”, *The Hindu Businessline*, 8 June, 2018, Accessed 7 September, 2018, <https://www.thehindubusinessline.com/.../patchy-pace-of-north-east-highway-projects>.
 22. See n. 2.
 23. *Ibid.*
 24. “Major scam unraveled in ongoing Trans-Arunachal project”, *Time8.In*, 22 November, 2017, Accessed 7 September, 2018, <https://www.time8.in>ArunachalPradesh>.
 25. Saikia, Arunabh, “Is hectic highway building in Arunachal leading to more landslides?”, *Scroll.In*, 14 July, 2017, Accessed 7 September, 2018, <https://scroll.in>India>Developmentand Environment>.

26. The local environment activists maintain that while preparing the DPR, the guidelines laid down by the MoEFCC were not followed. The consultancy firm used satellite imageries since the forest department did not give permission to visit the PTR. Citing the FCA, the forest department said any kind of survey, investigation and exploration is not permitted to be conducted inside the national parks and wildlife sanctuaries by any agency. See Rina, Tongan, “East-West Industrial Corridor plan in conflict with wildlife habitat”, *The Arunachal Times*, 23 February, 2020, Accessed 28 March, 2021, www.arunachaltimes.in.index.php>2020/02/23>east-west.
27. They have pointed out that one of the major objectives of the highway is to transport heavy machinery for the state’s hydropower projects. Arunachal figures in the very high seismic hazard zone and the local people downstream will face severe consequences if there is a catastrophe. The project also poses threat to the tiger population in the PTR and bordering Nameri. Moreover, the PTR is home to Asiatic black bears and at least four species of hornbills. The most serious threat to these hornbills is illegal logging. The proposed highway will only facilitate more logging and access. See Nandi, Jayashree, “In Arunachal Pradesh, plan to build road through tiger reserve under lens”, *The Hindustan Times*, 26 February, 2020, Accessed 28 March, 2021, www.hindustantimes.com>india-news>in-arunachal
28. Mazumdar, Prasanta, “Industrial corridor via tiger reserve enrages Arunachal activists”, *The New Indian Express*, 23 February, 2020, Accessed 28 March, 2021, <https://www.newindianexpress.com>nation>feb>ind>
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