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China's Infrastructure Development in Tibet

Evaluating Trendlines

Monika Chansoria

Centre for Land Warfare Studies
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Centre for Land Warfare Studies
RPSO Complex, Parade Road, Delhi Cantt, New Delhi 110010
Phone: +91.11.25691308 Fax: +91.11.25692347
email: landwarfare@gmail.com website: www.claws.in

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The People's Republic of China (PRC) has officially put forth the claim that Tibet belonged to China from the time of the Yuan Dynasty, if not earlier. Thereafter, the scenario changed with the Qing Dynasty (1644-1912), when Tibet was an integral part of a larger game being played between the Manchu, the Zunghar Mongols and the Russians. For decades, the Manchu and Zunghars competed over control of Tibet.[1] Tibet, which existed independently up to 1950, comprises approximately one-fourth of China's landmass today. Tibet, traditionally, encompassed the regions of the central plateau, Kham and Amdo. After annexing Tibet, China separated Amdo (the present Dalai Lama's birthplace) as the new Qinghai province, carved the central plateau and eastern Kham into the Tibet Autonomous Region (TAR), and later merged the remaining parts of Tibet into the Chinese provinces of Sichuan, Yunnan and Gansu.[2] According to Sinologist Mira Sinha Bhattacharjea,

> As far back as the early 18th century, the Chinese placed boundary stones at points west of Batang, to claim the Yangtse as the watershed, east of which Tibet would exercise only nominal control. Batang is part of Sichuan province at the border with the TAR. What was then called Eastern Tibet, it seems, was designed to be a buffer area between China and Tibet, under loose Chinese suzerainty.[3]

If these areas were to be ceded to Tibet, the remaining part of the mainland would have been disproportionately reduced. Batang seemed to be an important landmark east of the Yangtse River, which remained outside the *de facto* control of the Tibetans at the time of the Manchu Empire from 1727-

1910, 1912-1917, 1918-1932 and finally, during the 1940s. The 1913 Shimla Agreement demarcated Outer and Inner Tibet and kept Batang outside of the outer Tibet periphery. The tripartite agreement, however, was not ratified by the Chinese and, hence, the border between Tibet and China remained undecided. Outer and Inner Tibet, as marked in the Tripartite 1913 Agreement, correspond to the present-day TAR and the neighbouring provinces, respectively.

With the establishment of the People's Republic, China had in place a government that, for the first time since the collapse of the Qing Dynasty -- marshalled both the capability and the determination to assert its dominance over Tibet. For the leadership of the PRC, particularly the intellectual cadre, the vagaries of random conquests and submissions in the past no longer sufficed in making sense of history. Tibet's inclusion within the Chinese state was now something to be asserted, proven, and justified scientifically. The ideological imperative obliged the PRC to deal more specifically with the nature of Tibet's historical inclusion within the Chinese state. Out of this milieu evolved the interpretation that has been in place for several decades now – the affirmation that Tibet became an integral part of China during the period of the Mongol Empire when the Mongol rulers of China united Tibet and China.[4] It was in the 1950s that China coined what has become the present standard designation of Tibet: *Zhongguo de yi bufen* (one part of China), precise enough for the political purpose at hand and, thereby, affirming that Tibet was firmly within the PRC. Assuming vital importance by being a key element of China's nation-building process, the PRC, since 1949, appeared determined to end what they termed as "the century of humiliation" and consequently, established sovereignty over Tibet. Furthermore, the TAR was established in September 1965 with an area of 1.23 million sq miles as against 2.5 million sq miles of greater Tibet, large parts of which were merged with Qinghai, Gansu and Sichuan provinces of China. Controlling the TAR remains crucial to China vis-à-vis enhancing its security on the western frontier.

The Hu Jintao Administration has significantly tightened its policy over Tibet in an apparent attempt to ensure the proverbial Chinese Communist Party's "long reign and perennial stability" in the restive region. More hardline cadres are being appointed to run the TAR. While unprecedented aid has

been pledged for the estimated 6.5 million Tibetans living in the TAR as well as the neighbouring provinces of Sichuan, Gansu and Qinghai, the bulk of the new infrastructure projects also serve to speed up Han Chinese migration.[5] The tough stance adopted by the Party and state apparatus towards the ethnic minorities was approved at the 08 January 2010 Politburo meeting that was devoted exclusively to the Tibetan issue. President Hu Jintao, who was Party Secretary of Tibet from 1988 to 1992, heralded two goals for the TAR in the coming decade during the course of deliberations at the meeting:[6]

- Seeking a breakthrough-style (economic) development; and
- Maintaining long-term stability.

In the Politburo meeting, President Hu promised that the central government would help Tibet by boosting investment, transferring technology, and sending in more qualified officials as well as "experts and talents." Significantly, the region's GDP is set to grow by 12 percent this year, while fixed-assets investments are expected to grow by a whopping 18 percent. Under President Hu's dictum of "going down the road of development with Chinese characteristics and Tibetan flavour" (*Zhongguo tese, xizang tedian*), additional input has been focused on areas including infrastructure, tourism, mining and manufacturing.[7] However, President Hu and his team have not mentioned what kind of 'experts' will be dispatched to Tibet. In the wake of ethnic violence in both Tibet and Xinjiang in 2008, more soldiers and officers of the paramilitary People's Armed Police (PAP) have been stationed in the two regions.[8]

In its latest 2010 *White Paper on National Defence* released in March 2011, the PRC categorically stated that "separatist forces and its activities are still the biggest obstacle and threat… working for Tibet independence have inflicted serious damage on national security and social stability."[9] In fact, the issues of Taiwan, East Turkestan and Tibet should be read in correlation to the larger concept of Chinese national integration. China reiterated that its concepts of warfare and capability upgradation go well beyond meeting challenges in the form of Taiwan, Tibet and East Turkestan thus, explicitly implying that China's military capabilities shall continue to grow unabated, even as the Taiwan issue thaws; and that the Chinese national security strategy is set to be focussed to look beyond Taiwan.

The Chinese military recognises the importance of build-up of logistics on the battlefield and is taking steps to maximise its logistics capabilities. It was not until 2002, when Hu Jintao, then Vice President of the PRC, issued an order to transform PLA logistics, that rapid renovation actually began. The PLA logistics doctrine in 2000 still depended heavily on the "people's war" concept and not particularly on military assets. A portion of this doctrine stipulated that an individual must carry his own support and sustainment packages while fighting the enemy on the front lines. The General Logistics Department (GLD) and the PLA gradually began linking civilian and military logistics to provide what former Chairman of the Central Military Commission, Jiang Zemin, called "precision logistics." According to the US Department of Defence, the PLA is purchasing heavy lift assets from Russia to move their Heavy Brigade Combat Teams (HBCTs) to outlying provinces, including Fuzhou. The significance of Fuzhou province lies in the fact that it is the gateway to Taiwan, and if Taiwan decides to declare independence from the PRC, the PLA is likely to use Fuzhou as a platform to launch an offensive against Taiwan.[10] Nevertheless, the PLA units still lack high-mobility transportation assets, modular equipment, and automated tracking systems and have still not developed logistics packages that can support the HBCT concept. The PLA's current modernisation campaign will enable it to support future offensive operations outside of its mainland, given that the PLA's precision logistics is modernising rapidly. An ancient Chinese maxim states: "If you know your enemies and know yourself, you will win a hundred times in a hundred battles. If you only know yourself, but not your opponent, you will win one and lose the next. If you do not know yourself or your enemy, you will always lose."[11]

Emphasising Logistics Development

While emphasizing logistics reform, the 2010 Defence White Paper focuses on enhancing logistical support capabilities for diversified military tasks. In fact, the PLA is working on a multilateral approach towards building a modern logistics system by speeding up the process of integrating systems, outsourcing services, informationising processes and managing its logistical support systems more scientifically. The White Paper also accepts completion of the PLA's three-year plan for integrated improvement of grassroot logistics

systems for border and coastal defense units.

It should be recalled that a unified national logistics apparatus was not established until 1950, and even afterwards, logistical matters continued to be a low priority for the top brass.[12] The first large-scale exercise to assess the readiness of logistics units to take part in mobile wars under high-technology conditions took place in 1996. This was a major logistics drill in southwest China that was designed to examine the rapid reaction and mobile capabilities of logistics units located in the Chengdu MR, with the presence of GLD Director General, Wang Ke, underscoring the importance of the exercise. Portions of the drill included logistical support of joint land-air-sea operations.[13] The PLA training exercises have increased in size, intensity and complexity since the early 1990s and logistics have been heavily involved in many of these drills, especially those that have focussed on mobility and joint operations.[14] The PLA is likely to retain a sprawling logistics apparatus, but with expanding pockets of excellence, in the form of emergency support units and other rapid reaction logistics forces to provide support for future mobile wars. The PLA will increasingly utilise rapidly expanding civilian transport and infrastructure capabilities to augment its own limited resources.

Statistics from the China Federation of Logistics and Purchasing (CFLP) display that the nation's output value for logistics equipment increased almost seven times, reaching 200 billion yuan ($29.28 billion) in 2007, up from 30 billion yuan in 2002. With an annual growth rate of 30 percent, China's logistics equipment sector has been able to cater to a wide range of logistics services, from transportation equipment, including cranes and forklifts, to port and airport facilities. CFLP Executive Vice-Chairman, He Liming, noticed the industry's tremendous development over the years, since the time when he used to lament the gap between China and the West regarding logistics hardware. The last decade, however, has witnessed immense changes with the country's rapid economic growth, further stimulating a greater need for logistics services and creating a demand for related equipment.[15]

As the PRC prepares to become capable of winning in the era of high-technology warfare, greater focus is now being placed upon logistics development. There is a broad understanding that the logistics system needs to cope with the challenges thrown up by China's accelerating transformation into a market economy.

Logistics development has progressed upwards in China's military hierarchy, particularly since the PLA began in the early 1990s, to focus its attention on how to fight limited wars under high-technology conditions. Logistical support is at the heart of this new operational doctrine, especially the need for rapid mobility, intensive supply of materials and forward technical support. Consequently, logistics modernisation has become a high priority in the PLA's quest to build a 21st century fighting force.[16] The enhanced status of the logistics apparatus was underlined by CMC Chairman and Party General Secretary, Jiang Zemin, in 1991, when he included logistics support as one of his five major requirements for Army building. He also pointed out that "there would be no high combat effectiveness without a strong logistics supply,"[17] the understanding being that the logistics system needed to be overhauled to enhance its ability to support a more mobile and better-equipped fighting force, as well as to cope with the challenges of economic liberalisation.

The general principles of the war-fighting doctrine involving limited high-technology wars, emphasise mobility, rapid response, intensive consumption of war materials and off-shore operations. Without the logistical capabilities to meet such demands, the PLA would be unable to undertake military operations at, and above, the campaign level.[18] Moreover, a high-technology war is highly mobile and concentrated, where rapid tactical and strategic mobility would be essential. Contingency planning for the situation that the PLA may confront in the coming years, vis-à-vis Taiwan and the Spratly Islands in the South China Sea, includes operational concepts being worked out, dealing with sea and air blockades, landing operations, operations on coral reefs, mobile warfare, counter-attack in border areas, urban offensives, airborne operations and surgical counter-attacks.[19] Logistics planners in China are conscious that existing logistics capabilities are woefully inadequate to be able to support these demanding missions. They point out that there are several key areas in which capabilities need to be significantly expanded:[20]

- **Strategic and Tactical Mobility*:*** The PLA's transportation capabilities are limited, heavily reliant on ground assets, and primarily tactical in reach. Rapid strategic and tactical mobility, especially coordinated joint-Service operations, are critical in a high-technology war. Some logistics planners

argue that at the campaign level, each war zone (equivalent to a Military Region) should have the logistics capacity to support an amphibious landing of one infantry division.[21]

- **Emergency Support Forces:** Quick reaction logistical support units are vital to provide immediate assistance for frontline rapid reaction forces. A network of such units at high levels of readiness should be established throughout the armed forces.
- **Battlefield Repair and Support:** The rapid repair of damaged weapons on, or in the vicinity of, the battlefield is critical to maintaining combat effectiveness during war-time. This will become increasingly important as the PLA acquires new generations of advanced arms to replace its ageing arsenal of 1950s and 1960s-era weapons.
- **Advanced Stockpiling of War Materials:** Forward pre-positioning of large stockpiles of war materials is considered of vital importance because of the rapid and unexpected nature of how high-technology wars break out. The PLA's strategic war materials reserve system is concentrated in inland areas and needs to be extensively reorganised and relocated to coastal regions.
- **Logistics Mobilisation and Reserve Forces:** The mobilisation of reserve forces and civilian resources in war-time needs to be accelerated and significantly expanded because of the pressing time constraints of a high-technology war. This requires closer coordination between civilian and military authorities and the establishment and training of specialised logistical reserve support units. Logistics planners urge that each war zone should have two or three logistical reserve support brigades.[22]

Although reforms only began in the mid-1990s, the PLA is beginning to make progress in the upgrading of capabilities in these areas. Some of the major reforms that have taken place include the following:

- **Creation of Emergency Support Units and Reserve Logistical Support Brigades:** Networks of small-scale emergency support units and depots have been established in all Military Regions over the past few years. They are usually selected logistics units or depots that are tasked to provide rapid support in war-time, and many of them appear to be organised around logistics sub-units (*houqin fenbu*) attached to the Military

Region logistics departments.[23] Reserve logistical support units have also begun to be set up in recent years to augment regular forces. The PLA's first reserve logistical support brigade was set up in 1996 in Liaoning province.[24]

- **Enhancing Strategic and Tactical Transport Capabilities:** Hampered by limited funds, the PLA has been pursuing a double-pronged approach to the development of its transport capabilities.[25]

The TAR's biggest logistics centre in southwest China was completed in June 2009. The logistics centre is located next to a railway station at an altitude of 4,500 metres (m) in the Nagqu township of Nagqu county, in northern Tibet. It is about 300 km northeast of the regional capital, Lhasa. The project is expected to further exploit the potential of the Qinghai-Tibet Railway (QTR) and boost the region's economic development. Construction of the logistics centre stands at a cost of almost 1.5 billion yuan (US $220 million). The centre is expected to handle 2.23 million tonnes of cargo by 2015 and 3.1 million tonnes by 2020.[26]

The Chinese have always claimed that the primary aim of the logistics ramp up in the TAR is directed towards the economic prosperity of the region by providing more and more business opportunities. Tibet's economy has been growing at an annual rate of 12 percent or more over the past seven years, and the Qinghai-Tibet Railway is believed to have played a great role in boosting the region's development.[27] The consequent strategic challenges and their implications, however, continue to loom large, especially for India. The Chinese investment in infrastructure development in the border areas with India, coupled with a sustained double digit growth in its defence budget and the massive military modernisation undertaken by the PLA, are reasons enough for India to take cognisance of the above developments since they undoubtedly pose a security challenge to India.

The completion of the Golmud-Lhasa rail link is central to China's Great Western Development Policy, aimed at promoting the cause of Chinese nationalism and 'great power status' by virtue of greater economic development of the country's under-developed western areas that are primarily populated by ethnic minorities. In fact, Hu Jintao has long advocated a policy of generating economic prosperity so as to

eradicate separatism in this part of China. Accentuating the potential of the Golmud-Lhasa rail link, work on Tibet's largest logistics centre to handle freight for the railway line was completed in June 2009. The Nagqu Logistics Centre comes up adjacent to a railway station at an altitude of 4,500 m in the Nagqu township of Nagqu county, northern Tibet, 300 km northeast of the region's capital, Lhasa. Covering an area of 533 hectares, the centre is expected to handle up to 4.07 million tonnes of freight by 2030, further exploiting the potential of the QTR and boosting the region's economic prospects.[28]

On Road Towards Economic Consolidation

Like Deng Xiaoping, Hu Jintao, too, advocated a policy of generating economic prosperity to eradicate separatism in Tibet and Xinjiang. Hailing the infrastructural development in the TAR as a national security strategy, Hu stated, "Rapid economic development is the fundamental condition for realizing the interests of all ethnic groups in Tibet and also the basic guarantee for greater ethnic unity and continued stability there."[29]

In the last decade, Tibet has been the largest per capita recipient of subsidy and funding from the central government. On the TAR's 20th anniversary, the government spent 500 million yuan (US $78.2 million) on 43 projects; on the TAR's 30th anniversary, it spent 4.6 billion yuan (US $720.1 million) on 62 projects; and on the TAR's 40th anniversary, it spent 6.42 billion yuan (US $1 billion) on 24 projects. TAR Chairman, Jampa Phuntsok stated that in 2004, over 16.6 billion yuan (US $2 billion) was invested in building infrastructure. Most of the funds came from the central government under the "Western Development Programme." As per the testimony of Tsering Dhondup (a nomad from Kanlho County) to the Tibetan Centre for Human Rights and Democracy (TCHRD), mismanagement and embezzlement of public funds are common at the local government levels.[30]

Today, Tibet houses more than 300 moderately-sized modern industrial and mining enterprises, including key industries such as electric power, mining, building material, chemicals, textiles, tanning, printing and food processing but, hardly any of them seems to be defence-oriented. As per numerous reports, the Chinese government has planned to invest US $3.8 billion to develop an additional 117 industries in the TAR.[31] China also

intends to make Lhasa a Special Economic Zone (SEZ). The status being conferred on the region will entail a host of incentives such as low tax rates (15 percent as compared to the usual 33 percent). Earlier experience has shown unprecedented growth rates in areas declared as SEZs (up to 32 percent). The GDP of the TAR grew at 14 percent in 2007, much more than China's average. This rapid growth rate is attributed to readjustment of the existing, and introduction of new, industries; heavy investments by the central government in infrastructure; and reforms in state-owned enterprises and government organisations. To implement its development plans, the Chinese government has undertaken certain development projects like road, rail and air network, Fuel, Oil and Lubricants (FOL) pipelines and communications. It has announced a US $40 million project for restoration of the sacred buildings in Tibet.[32] Beijing has also announced plans to convert 50 counties of the TAR and two zones of Sichuan and Yunnan into "Shangri La Tourism Economic Zones" for which US $9.6 million has been allocated.[33]

Logistics Development in Tibet

In the decades since the founding of the PRC, coastal China did, indeed, race ahead as far as development was concerned while Western China stagnated. In fact, Deng Xiaoping, himself a son of the Sichuan soil, told the people of western China, "Let them (coastal China) get rich first, you can get rich later." Once the economy of coastal China had acquired a self-sustaining momentum, policy-makers under President Hu Jintao subsequently appear to have turned their attention to Western China.[34] The justifications for the western development policy are economic, political and social. Beijing is increasingly concerned about the growing economic gap between east and west, which led to social unrest and riots in different areas during the 1990s. The "Go West" campaign, it is declared repeatedly, aims to make the west an "incubator for skilled manpower" and a "hotspot for foreign investments."[35]

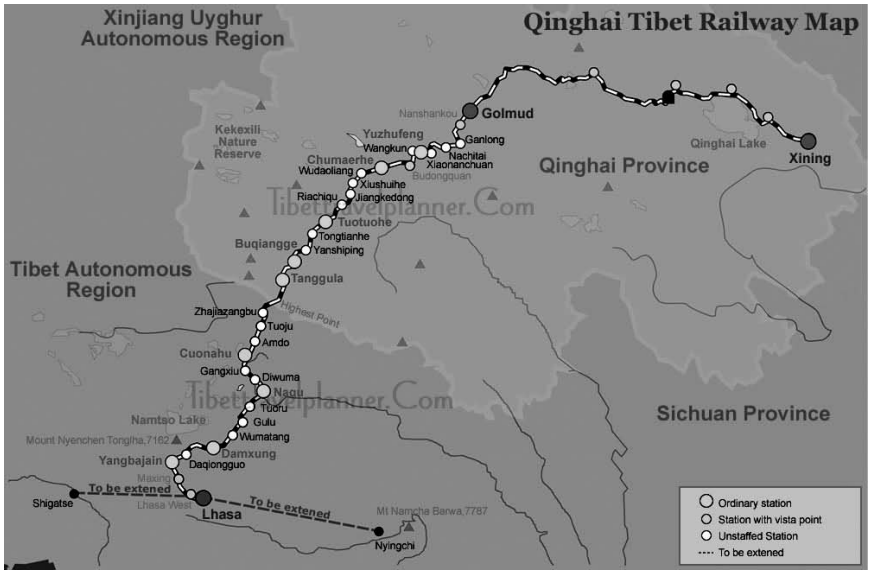
The PRC has been carrying out extensive infrastructure development in the TAR and areas close to its southern borders to include the development of road, rail and air networks, FOL pipeline, telecommunications and industrial base, besides giving a boost to

the economy of the TAR. Such extensive development of logistics infrastructure in the TAR indicates the impetus being made available to the PLA's logistics capability which, in turn, will enhance its operational capability in the TAR.[36] This dual objective was further underscored when it was reported that, "The infrastructure development is well beyond the genuine needs of Tibet."[37]

The Chinese government's deliberate attempt of supporting an influx of the Han population that is settling in these areas is changing the demographics of the region in favour of the Han Chinese. A rising tide of Han Chinese migrants is flooding into Tibet, diluting its character and taking away many of the available jobs. The Hans constitute a major chunk of the population in Lhasa, increasing from approximately 4 percent in 1990 to 6 percent in 2000.[38] It is believed that by 2015, there will be 20 million Han Chinese in the TAR, subsequently shifting the cultural boundaries between the Tibetan people and the Han Chinese. The "Go West" campaign includes giving fiscal incentives and sending Chinese graduates to Tibet. Recently, the Chinese have instructed all conscripts posted in the TAR to apply for change of residential registration, which will facilitate the demobilised cadres to find employment in the TAR. Such a practice would, in the long run, change the demographic pattern of the TAR, as a large majority of the approximately 50,000 cadres demobilised every year is encouraged to settle in the TAR. A decision has been taken to make the Chinese language the medium of instruction in schools, which will necessitate more Chinese tutors to come from the mainland.[39]

The improvement of rail infrastructure continues to remain a top priority. The demand for rail capacity is much greater than the supply; roughly 160,000 carloads per day are needed, but the railroads can only support 90,000 carloads per day. Also, China is making significant investments to improve its highways and is planning to build over 50,000 km (31,000 miles) of expressways over the next 15 years. The Chinese government has begun placing priority on infrastructure because it comprehends that the overall health and growth of the economy is increasingly dependent on logistical capabilities.[40]

Extended Golmud-Lhasa Railway Route



Source: www.tibettravelplanner.com

By virtue of initially launching unmanned trial operations, the Qinghai-Tibet Railway (QTR) became functional on 01 May 2006, thus becoming Tibet's maiden railway line connecting and integrating the Tibetan plateau with the rest of China, at a staggering cost of US $4.2 billion. The QTR is the latest manifestation of China's resolve to consolidate its hold on Tibet, along with other channels of logistics infrastructure build-up, given that it would ramp up induction timings while increasing build-up and logistics sustenance capability in the TAR up to major townships. Qinghai lies in the Tibetan highlands at an average elevation of 3,000 m (9,800 ft) and is mainly a high, desolate plateau. Opened to the public by Chinese President, Hu Jintao, the 1,142-km Qinghai-Tibet railway line from Golmud in Qinghai province to Lhasa in Tibet became fully operational on 01 July 2006. Incidentally, the launch of the QTR coincided with the 85th anniversary of the founding of the CCP as well as the 10th anniversary of Hong Kong's handover from British rule to China.

In a televised address, President Hu Jintao, who was present during the opening ceremony, alongside top Communist Party cadres, state news

media, and 40 foreign journalists handpicked by officials to ride the first deluxe run,[41] called the completion of the railroad "a magnificent feat."[42] Hailed as an "engineering marvel," the Chinese already see the railroad as an example of China's greatness in the new century and proof of its claim to be a "technological superpower."[43] The completion of the railroad, however, would not have been possible without US General Electric's diesel engines, which maintain an average speed of 100 km per hour, even at altitudes of 4,000 m, where the thin air can have a halving effect; and Canada's Bombardier, which fulfilled a US $280 million contract to build carriages that can withstand the journey through Tibet's frozen mountains (some of these have deluxe sleeping compartments equipped with showers, glass-walled sides for a panoramic view, entertainment centres, gourmet dining areas, and toilets with sewage and waste-treatment systems).[44]

The highest point of the QTR comes in at the 5,072 m (16,640 ft) Tanggula Pass in the Kunlun mountain range. In addition, China has also unveiled plans to extend the Chinese National Rail Network to the border with India. The railway line would likely reach the Tibetan town of Dromo near Nathu La and Sikkim. Further, up to US $1.2 billion is expected to be invested in building new rail lines in the Tibetan region in the coming decade, including a line extending west from Lhasa to Shigatse and another heading east from Lhasa along the Yarlung Tsangpo river (Brahmaputra) to Nyingchi (Kongpo). The line to Dromo/Yatung will be an extension of the Lhasa-Shigatse line. Significantly, the double guaging of the railway line from Lanzhou to Golmud will extend to the Lanzhou MR, greatly enhancing the Chinese operational logistic capacity.[45] Besides, the Korla-Lanzhou-Chengdu railway line is also likely to be converted into a double track. The eastern link from Chengdu to Lhasa via Ngiti, Pangta and Markhan Dzong is slated to be completed by 2015. It has been widely reported that the QTR will facilitate an increase in the movement of products up to 45 times its current level and cut down transport costs for goods by 75 percent. China is likely to project Tibet as a major trade hub between China and South Asia. It has built settlements every 60 km of this 1,118-km-long railway line. These settlements, primarily of Han Chinese, are indicative of the growing Han lifestyle in Lhasa.[46]

Roads and Highway Networks

The rapid build-up of China's national road and rail transport system has greatly enhanced the PLA's land-based transport capabilities. Many key civilian highway and railway projects, especially trunk rail lines and inter-provincial highways linking interior and coastal regions, have been constructed to military specifications and can be turned over to the PLA in the event of war. During the Eighth Five-Year Plan, for example, more than 50 national highways were built or renovated to military standards, including three roads leading into Tibet.[47]

China has developed a network of internal highways and subsidiary/feeder roads in the TAR to connect strategically significant border areas with India, Nepal, Bhutan and Pakistan by means of motorable roads. It has developed 58,000 km of road network in Tibet, including five major highways and a number of subsidiary roads. It is learnt that the PRC plans to build additional roads in the TAR to link 92 percent of the TAR's towns and 70 percent of its administrative villages. The PRC is expected to spend 20 billion yuan (US $3.13 billion) in the coming years, mainly on the construction of 103 highway projects. Presently, 80 percent of Tibet's townships and nearly 20 percent of villages are accessible by highways.[48] The Western, Central and Eastern Highways have leveraged greater connectivity between western and mainland China.

Qinghai-Tibet Highway (Central Highway): Running from Xining in Qinghai to Lhasa in Tibet, this highway is the most crucial and is often referred to as the 'lifeline' of the TAR. The 2,122-km highway carries more than 80 percent of cargo and 90 percent of passengers into or out of Tibet. It is paved with asphalt and crosses the Kunlun and Tanggula mountain ranges. The entire stretch of the road is black-topped two-way, with proper highway markings wherein vehicles can travel at an average speed of 35-40 km per hour and cover a distance of approximately 200-250 km in a single day.[49]

Lhasa-Kashgar / Aksai Chin / Xinjiang Highway (Western Highway): Connects Xinjiang to Tibet, by linking Kashgar and Lhasa (3,105 km). From Quilanaldi, the road branches off to Khunjerab Pass and, subsequently, becomes the Karakoram Highway right upto Gilgit. In addition, there are large numbers of lateral roads leading to the passes on the Indian borders.[50]

Sichuan-Tibet Highway (Eastern Highway): This highway between Chengdu (Sichuan) and Linzhi (Ngiti) is 1,715 km long (2,413 km up to Lhasa). There has been a crucial upgradation of the 400-km stretch from Lhasa to Ngiti (opposite central Arunachal Pradesh). Black-topped and asphalt-surfaced, it is primarily aimed at improving lateral mobility between central and eastern TAR. The Chinese government had earmarked 5.3 billion yuan (US $829.6 million) for improving the 573 km stretch of the Sichuan-Tibet Highway along with six regional highways and the 3,000 km road leading to local counties and villages, among other highway projects.[51]

Yunnan-Tibet Highway: This 716-km-long highway branches off from the Eastern Highway and is four to five metres wide, prone to frequent landslides and disruptions during the winter and monsoon season. This highway holds special significance in military terms for India, owing to the build-up of the PLA opposite India's eastern theatre, given China's logistics capacity-building and accelerated facilitation of men and material in the critical sectors of the northern and eastern borders.[52]

A major infrastructure development project in the TAR, including two highway bridges over the Lhasa and Yarlung Tsangpo rivers, and a 2.4-km-long tunnel (total road length of 13.28 km) costing 650 million yuan, (US $101.7 million) is underway, which will reduce the travelling distance between Lhasa to Gongar international airport from 98 to 53 km. With the opening of border trade via Nathu La, additional border trade venues in Nepal (in addition to the existing two in central and western Nepal), and plans for border trade at Bumla, Demchok and the old Stilvel route, the TAR appears poised for 'fast-track' holistic development. Moving of the logistics resources from townships to the place of application and sustenance of forces during road closure periods (when dumpling of additional safety stocks for the road closure period is required) will continue to be a criticality for the PLA.[53]

Upgradation of Airfields

There are five operational airfields inside Tibet and as many as 15 surrounding it. The main airfields within the region include Gongar, Hoping, Pangta, Linchi and Gar Gunsa. The Gongar and Pangta airfields are being upgraded to cater to 1.1 million and 1.0 million transients respectively, i.e., 2.1 million transients per year. Other additional airfields include Donshoon, Nagchuka and

Shiquanhe. In fact, Pangta is known to have the highest elevation in the world. Further, ten new airports are planned to be constructed in the next five years. Construction of the Nyingtri airport (Linzhi) located in southeastern TAR was one of the key projects completed in the Tenth Five-Year Plan and was made operational in July 2006. It is situated near Nyingtri in the Nyingchi Prefecture, which shares borders with India and Myanmar and is strategically significant to India. Another airfield in central TAR at Bayixincun is being pursued.[54] China is also opening another airport at Nyingchi, apart from modernising Lhasa's Gongar airport. There are 15 airfields in and around Tibet, of which only three are open for civilian activity. Further, Su-27s have recently been deployed in the Chengdu MR and they might, in the future, also be deployed in Tibet.[55]

Significantly, the establishment of the TAR International Airline is presently under consideration in Tibet. Currently, the China Southwest Airline has 10 domestic air routes in Tibet, including those from Lhasa to Beijing, Chengdu, Shanghai, Guangzhou, Chongqing, Xi'an and Xining, as well as one international air route from Lhasa to Kathmandu. Such developments would progressively increase the air induction capability into the TAR. It needs to be mentioned here that owing to the critical high altitude of the airports in Tibet, the Chinese Air Force encounters problems in terms of fuel, oxygen as well as the length of the runways. Owing to this, China has purchased an additional 18 IL-78 aircraft for developing the existing air-to-air refuelling capability, so that the aircraft can take off with added load and use less fuel and, subsequently, can be refuelled in the air to achieve greater endurance, which shall be crucial as far as the radius of action as well as payload of all aircraft is concerned.[56]

Construction of new airfields and the upgradation of Advanced Landing Grounds (ALGs) and helipads in and around the TAR (coupled with acquisition of new transport aircraft) is likely to enhance China's strategic airlift capability. The Chinese will be able to induct/concentrate formations in comparatively shorter time-frames and, consequently, shorter warning periods. The functional international standard airfields in the TAR (Gongar, Pangta and Nyngchi) would give the Chinese a considerable strategic airlift and logistics advantage. Further, the airfields on the periphery of the TAR can be activated to give additional logistic and operational support. The

construction/upgradation of airfields/ALGs closer to the borders enhances the PLAAF aircraft's striking range and provides the PLAAF the ability to strike/engage targets in India on a broad front and in depth.[57]

Foremost among the infrastructure schemes mooted for the 12th Five-Year Plan period of 2011 to 2015 is what the official Chinese press bills "the world's highest airport." Construction of the 1.8 billion yuan (US $263.5 million) airport in Tibet's Nagqu prefecture, which has an elevation of 4,436 m (14,639 ft), will begin later this year. According to the local media, the Nagqu Airport would, together with ultra modern facilities such as the Qinghai-Tibet Railway, "perfect a three-dimensional transport network that will envelop all Tibet."[58]

Fibre Optic Communication (FOC)

Fifty-eight Very Small Aperture Terminal (VSAT) satellite stations are reported to have been installed in the TAR. All PLAAF units and sub-units in the TAR have been connected by satellite communication. China is reported to have laid a fibre optic network in all the 55 counties, which includes Ali, and the border area of Chamdo; 1,100 km of Optical Fibre Cable (OFC) have been laid, connecting Lhasa with Nyingchi and Qamdo counties in east TAR. The plan to connect all the cities and counties of the TAR by 2005 appears to have been successful. Another major development has been the inter-connecting of Chengdu and Lanzhou MRs with one another, and both these MRs to Beijing, through secure communications, ensuring secure and real-time communication. This aspect has further been emphasised during subsequent training. FOC is being steadily extended towards military installations along the borders. All Military Supply Depots (MSDs) are connected to Lhasa by radio and OFC.[59]

In 2006, Tibet invested 1.447 billion yuan (US $226.5 million) for improvement of the telecommunications service in the farming and pastoral areas. Telephone lines now link 2,112 administrative villages, accounting for 35.59 percent of the total in Tibet. In 2006, 56,900 phone lines were added, bringing the total capacity to 394,400 lines. The number of additional fixed telephone subscribers was 156,700, bringing the total number to 682,200, including 649,700 urban subscribers and 32,500 rural ones. In all, 140,000-line mobile phone exchanges were added, bringing the total capacity to

800,000. There are 605,500 mobile users, 136,200 of whom were added in 2006. At the end of the year, the total number of fixed and mobile telephone subscribers reached 1.2877 million, an increase of 292,900 over the previous year and the telephone popularisation rate reached 46.5 per 100 persons.[60] The upgrading of the communication networks through fibre optic cables and satellite communication indicates real-time connectivity achieved by the PLA; a quantum jump in communication technology, wherein Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) shall be the key. Their upgradation shall enable the conduct of effective operations and sustain increased force levels in the future. The enhanced communication security will continue to tilt the balance in cyber warfare in favour of the PLA.[61]

Interpretation of Infrastructure Build-up in Military Terms

Although estimates vary, operationalisation of the QTR provides China with the capability to mobilise as many as 12 divisions (approximately 12,000 troops make a division) in a month's time. The infrastructure and logistics build-up shall double up as base support for the PLA to facilitate military operations. Now China could well transfer telecommunications and other command and control facilities, which are needed to deploy missiles from launches at a chosen place. The QTR has, indeed, made tremendous headway by virtue of increasing the transportation capacity, thereby enhancing induction capability and faster build-up of logistics up to future railheads, and providing capability for day and night movement. Unswerving rail links from Lanzhou to Kashi and to Lhasa shall aid easy switching of reserves and logistics resources between the Chengdu and Lanzhou MRs bordering India.[62] Presently, the travel time for troops from Golmud to Lhasa is approximately 72 hours (including night halts and restrictions). The QTR line has reduced this to 16 hours, implying a complete turnaround time of about three days from Golmud to Lhasa. In fact, Chinese troops were being transported on this rail network to Lhasa in December 2007, signifying its use for military purposes. The *Xinhua* news agency cited unnamed sources in the PLA as saying that the railway would become 'a main option' for transporting soldiers.[63] The QTR will also permit easier movement of larger and more capable ballistic missiles into the TAR. Approximately 2.18 percent of the 1,118-km-long railway is made up of

tunnels. Once the construction of these tunnels was completed, however, they were kept unused for several months, which led to speculation that some of the tunnels were probably being used as missile bases. The completion of the railway may, therefore, be followed by deployment of such missiles into the TAR, to be able to cover longer range targets in South Asia as well as the Indian Ocean Region (IOR). It may also facilitate China's second-strike capability by avoiding the reach of US missiles. Some of the tunnels on the railway line can also be developed as possible secure storage sites for rail mobile ballistic missiles. This, in turn, will minimise the vulnerability of the lines of communication. The QTR will, thus, cause a reduction in military expenditure and an easing of the logistical difficulties faced by the PLA in moving men and materials to/from the frontiers.[64] In addition, the PLA is also concentrating on developing logistics and infrastructure to improve the rapid deployment capability of the integrated forces.

Rapid Reaction Forces

A small, but concentrated high-tech force perfectly suited for flexible use, especially in the case of regional contingencies, is termed as a Rapid Reaction Force (RRF). Capable of responding to local war scenarios, these rapid reaction units are regarded as the PLA's most capable fighting forces. During the late 1990s, only a small proportion of the PLA logistics system was capable of being restructured to support combat operations under high-technology conditions. Many of these units were attached to designated rapid response units of the ground, air and naval forces, as well as that of the Second Artillery. The number of RRFs in the PLA, however, has grown steadily since their creation in the mid-1980s.[65] The 15th Airborne Army is the PLA's primary strategic rapid deployment force, but it has only been used for internal security missions so far.[66] It has been reported that the Chinese have identified and located RRFs with specific emphasis on each particular MR and the nature of threat associated with it. Accordingly, one Motor Infantry Division in the Chengdu MR and two additional Infantry Divisions and a Motor Infantry Division in the Lanzhou MR with special reference to India are reported to serve as rapid reaction units.

The rapid reaction capability of the Chinese armed forces in the Tibet region, particularly their ability to quickly manoeuvre heavy equipment, has

been greatly enhanced. This was indicated by the fact that the PLA soldiers on T-90/89 vehicles on the streets of Lhasa were all wearing the "leopard" camouflage uniforms, specifically designed for mountain warfare operations. These uniforms appeared in a video footage of the 149th Division during exercises witnessed in 2008. Calculated on the basis of being able to transport most of the heavy equipment of a whole mechanised division within 48 hours, it is unlikely that all the division's equipment would be moved; the PLA would be able to transport approximately ten light mechanised divisions and some heavy mechanised divisions through the railroad to Tibet from the Lanzhou and Chengdu MRs within 30 days.[67]

The average load capacity of one Chinese train car is normally 60 tonnes, with about 20 cars in each cargo train. This ideally should imply that each train could transport 1,200 tonnes, and, thus, 11 trains travelling both ways would be enough for each day. In times of war, the actual number of trains running on the railroad could double to roughly 20 trains both ways, each day. If the total weight of the equipment and combat material needed for one rapid reaction division of the Chinese Army was around 15,000 tonnes, the Qinghai-Tibet Railway could transport a whole rapid reaction division on an average day. In other words, within every one-and-a-half to two days, China could move one rapid reaction division from the Chengdu MR or one rapid reaction division from the Lanzhou MR to Tibet.[68] China's air transport capability, including additional airborne troops, rapid reaction troops and armed police, could be directly delivered to Lhasa from the air. Since airdrop operations would take place in the Tibet region, there would be no need for ground-based air defence firepower. The railway would allow the 61st Plateau Rapid Reaction Motorised Division of No. 21 Group Army under the Lanzhou MR and the 149th Rapid Reaction Motorised Division of the Chengdu MR to quickly enter Tibet.[69]

A study of the development of the logistics infrastructure in the TAR and along the China-India frontier reveals that there is an increase in the logistics and infrastructural capability of the PLA to induct and sustain a larger quantum of forces up to major townships in the TAR. The crucial restrictive factors for force applications, however, are deployability and logistics sustainability at the places of application. The depth of the operations, undoubtedly, shall continue to be governed by terrain, the vagaries of climate, sustenance

capacities of the thrust lines chosen, and the Indian defence preparedness at the chosen area of application. The PLA logistics set-up along the China-India borders currently caters to a limited force level in the border management role. Hence, supplies, ammunition and FOL for almost the entire force level being inducted for an offensive, have to be moved and dumped near likely places of application, prior to the offensive.[70] The key impediments envisaged by the PLA in the TAR include the following:[71]

- Long distance from rail heads to important communication centres (currently being addressed) and periodic disruption due to climatic conditions lead to delay in induction.
- Terrain and weather restrict logistics operations from March to November. Build-up to the rail head, however, is possible throughout the year.
- Need for extensive winter stocking; move of logistics resources at the place of application and sustenance of forces during the road closure period necessitate winter stocking for the road closure period.
- Reduced airlift capability and long axes of maintenance and disruption due to high altitude conditions.
- Adverse effects of high altitude on men and material; need for acclimatisation, especially in the case of air induction.
- Application of RRFs along India's borders would also require ground logistics support like other mountain formations, although these can be air-maintained for short directions.
- Logistics induction is vulnerable to the IAF.
- The PLA's modern joint logistics system is still untested in war-like scenarios.

Tibetan Unrest and the PLA

The March 2008 unrest in Tibet undoubtedly raised questions of China's sovereignty over Tibet, with speculation rife over whether the unrest would erode China's bargaining position during border talks, particularly with respect to its claim over Tawang (Arunachal Pradesh).[72] The coinciding of the 50th anniversary of the 1959 Tibetan revolt, that resulted in China's military shelling of the Tibetan capital of Lhasa, and consequently crushing the uprising by the Tibetans, which forced the Dalai Lama and some 85,000

followers to flee into exile in India, raised a palpable sense of concern within India. As the Tibetans marked the 50th anniversary of that uprising, which coincided with the Chinese government holding the People's Congress in Beijing, presumably, the last thing they wanted was bad publicity in the world regarding Tibet. The Tibet issue, particularly the factors and conflicts around the Olympics and the torch relay seemed to have moved the whole issue into a very emotional landscape for many Chinese. There is something much larger that is being witnessed; the growth of Chinese nationalism that is a focussed springboard to the Tibetan issue.[73]

Following the Tibetan protests, a special security coordination unit, the 110 Command Centre, was established in Lhasa, with the primary objective of suppressing the disturbances and restoring full central government control understandably under the direct control of Zhang Qingli, First Secretary of the Tibet Party and a Hu Jintao loyalist. Zhang is also the former Xinjiang Deputy Party Secretary, with considerable experience in counter-terrorism operations in that region. In addition, significant positions in Lhasa are being held by Zhang Xinfeng, Vice Minister of the Central Public Security Ministry and Zhen Yi, Deputy Commander of the People's Armed Police Headquarters in Beijing. The seriousness with which Beijing treated the unrest was further illustrated by the deployment of a large number of important Army units from the Chengdu MR, including brigades from the 149th Mechanised Infantry Division, which acted as the region's RRF.[74]

A United Press International (UPI) report stated that the elite ground force units of the PLA were involved in Lhasa, with the new T-90 armoured personnel carrier and T-92 wheeled armoured vehicles being deployed. The UPI report also brought out that China eventually denied the participation of the Army in the crackdown, saying it was carried out by units of the armed police. Such equipment, as mentioned above, however, has never been deployed by China's armed police. Air support was provided by the 2nd Army Aviation Regiment, based at Fenghuangshan, Chengdu, in the Sichuan province. It operates a mix of helicopters and Short Take-off and Landing (STOL) transports from a frontline base near Lhasa. Combat air support could be quickly made available from fighter ground attack squadrons based within the Chengdu region. The Xizang Military District forms the Tibet garrison, which has two mountain infantry units: the 52nd Brigade based at Linzhi and the 53rd Brigade at Yaoxian Shannxi.

These are supported by the 8th Motorised Infantry Division and an artillery brigade at Shawan, Xinjiang.[75] According to Srikanth Kondapalli, it was widely reported that at the time of the unrest, China had deployed 180,000 troops in the Chengdu MR and nearly 220,000 troops in the Lanzhou MR. Notably, the Chengdu MR has operational jurisdiction in Sichuan, Tibet, Guizhou and Yunnan regions and the Lanzhou MR has operational jurisdiction in Gansu, Qinghai and Xinjiang regions.

Although estimates vary about the exact nature and number of PLA's troop deployment in TAR, the fact remains that the quantum of infrastructure activity in the region is well beyond the "genuine needs" of Tibet or the Tibetan people. If read in the backdrop of Chinese reiteration that its concepts of warfare and capability upgradation go well beyond meeting challenges in the form of Taiwan, Tibet and East Turkistan, this for sure, tends to throw caution to the winds.

Responses and Options to China's Build-up in TAR

Given the current backdrop, although the border between China and India is rather calm with no overt mobilisation of troops into Tibet, there is a clear possibility that once the Taiwan issue is resolved by China, the subsequent focus could well shift towards India in the next couple of years, owing to the impending territorial and boundary dispute that continues to loom large. According to the Tibetan Government-in-Exile in Dharamsala, the estimated number of troops in Tibet stands at about 500,000 in the form of the People's Armed Police, the Chinese Frontier Guards and the Garrison Duty Forces. There have been numerous estimates as far as the quantum of force and build-up logistics in relation to the infrastructure development in Tibet are concerned. Rosita Dellois in her book *Modern Chinese Defense Strategy: Present Developments, Future Strategy,* estimated that China would be able to deploy as many as 30 divisions against India in a potential conflict scenario. Besides, *The Chinese Armed Forces Today* published by the US Defence Intelligence Agency, had revealed that the daily resupply requirement of a standard Chinese division would be about 300 tonnes short for moderate combat and an average of 200 tonnes short for a protracted period of combat.

Srikanth Kondapalli underscores the Chinese intent vis-à-vis Tibet by stating that nearly 90 percent of the TAR's budget is subsidised by the central

government. The Chinese government has spent roughly 40-45 billion yuan in the last 40 years and is spending an added 40 billion yuan under the 11th Five-Year Plan (2006-10). The Chengdu MR controls the entire TAR, except for western Tibet which is under the Lanzhou MR, with five reserve divisions present for any contingency. Kondapalli further stated that Han Chinese influx is amply visible as far as modernity is concerned. In front of the Potala Palace, there used to be kiosks run by Tibetans. As the construction of roads progressed, most of the Tibetan structures were demolished and new malls came up, primarily owned by Han businessmen – a very crucial consequence of the growing connectivity between Tibet and the mainland. Thus, the Han Chinese influx is further eroding the Tibetan culture and leading to marginalisation of Tibetans.[76]

According to Kondapalli, there are 30 regiments of the PLA stationed at Golmud, which can use the railway line and reach Lhasa, Shigatse and other feeder lines. The Chengdu to Lhasa line can bring in five more divisions of the PLA to the border. The airfield, which is being constructed 30 km away from Shiquanhe, is a major military installation. Although China is ramping up infrastructure in areas close to the border, it should be mentioned that in the 1990s, as part of the Joint Working Group meetings, China had vehemently objected to any construction or air activity in the Ladakh region.[77] The Chengdu MR houses two Group Armies, two tank brigades and one artillery division. No airborne divisions are present in Chengdu or Lanzhou. The 13 and 14 Group Armies, present in Chengdu, are called 'monkey troops' in China, similar to the Ladakh Scouts in the Indian Army, who are trained to rapidly climb mountains and can swiftly adapt to extreme weather conditions. In fact, the 13 Group Army is an RRF – potentially a significant concern for India. The Chengdu MR also commands the Chongqing garrison and a significant number of independent and border forces in Tibet. Both the General Headquarters Department and the Chengdu MR expend great efforts to make sure the forces in Tibet are adequately supplied, primarily by road, but sometimes also by aircraft.[78] Given that the Chengdu MR caters to Southeast Asia and the Lanzhou MR to Central Asia and Aksai-Chin, Kondapalli estimates that there are 400,000 troops in Tibet that face India and other nations.[79]

According to Brahma Chellaney, no country is going to be more affected by the Chinese plans and projects in Tibet than India. He states that the Golmud-

Lhasa railway line has significantly augmented China's rapid military deployment capability against India, just when Beijing is becoming increasingly assertive in its claims on Indian territories. This hardline stance, in the midst of intense negotiations to resolve the dispute over the 4,057-km Indo-Tibetan border, opines Chellaney, is no less incongruous than Beijing's disinclination to set up a joint expert-level mechanism on inter-state river waters, as agreed during its President's state visit to New Delhi in November 2006, given that Beijing dragged its feet on setting up an innocuous interaction mechanism.[80] As the tensions on the border escalated in the recent past, with incidents of incessant Chinese intrusions, it reflected a perceptible hardening of China's stance toward India. Chinese troops have repeatedly attempted to gain control of Sikkim's evocatively named "Finger Area" – a tiny but key strategic location. The fact that China holds the military advantage on the ground and its forces controlling the heights along the frontier, with the Indian troops perched largely on the lower levels, cannot be negated. Furthermore, by building modern railroads, airports and highways in Tibet, China appears to be in a position to rapidly move in large numbers of additional forces to the border with India, so as to potentially strike at India at a time of Beijing's choosing.[81]

While analysing the impact of the QTR, Phunchuk Stobdan opined that primarily intended to boost the "Go West" campaign under the 10th Five Year Plan, the Golmud-Lhasa railway line alters the military balance, but has been ignored in India. The military implications for China include a reduction in military expenditure and an easing of the logistical difficulties faced by the PLA, in terms of supplies and garrisons along the frontiers. It also allows a feeder line, service bases and airfields. Stobdan claims that China will be able to transfer 12 divisions in a span of 30 days to meet pre-positioned equipment. Tibet's missile launch brigades include the Da Tsaidam 412 Brigade, the Datung-Wulan 408 Brigade, the 9th Academy (Factory 211) in Amdo area, an Anti-frigate Missile Centre at Drotsang, a missile launch site at Terlingka, a new launch site in Amdo, bases at Risur in Nagchuka, and bases at the Tago Mountain. In addition, there is also an underground site at Lhasa and Kangpo.[82] The implications of such activity for India are significant. The strategic importance of Tibet lies in the fact that China is soon going to control Asia's principal source of water. Nearly half of the world (47 percent, in terms of population, in 10 countries) depends on Tibetan water for its

sustenance. China will use water as a strategic commodity and as a tool for energy and economic diplomacy with neighbours. There is a Western Route Transfer Project, a South-North Water Diversion Project and a West-East Power Transfer Project. Moreover, a barrage near Tsamda gorge near Guge kingdom could disturb the Sutlej flow and enable China to control and regulate the flow of water into India. Similar things could also happen in the Lohit (Zayul Chu), Subansiri and Indus, amongst others. Essentially, while China launches a new unconventional/non-linear war, the question needs to be asked: is India prepared to respond to such an onslaught?[83]

As a matter of fact, the Pareechu lake controversy in 2004 brought out that the issue of river water sharing was another area of potential discord between the two countries. It is well known that China and India share the waters of the Indus, Brahmaputra and Sutlej rivers and are upper and lower riparian states, respectively. This makes India vulnerable to manipulation of the river water supply by China. In 2004, China had informed India that approximately 35 km from the Himachal Pradesh border, an artificial lake measuring about 230 hectares had been formed on the Pareechu River, a tributary of the Sutlej. This incident triggered a debate in India over whether the formation of the lake was a natural phenomenon or a man-made one. If the possibility of the latter was true, it provided China with the capability to devastate the lower reaches of the river in India at will. India requested China to allow Indian experts to examine the topographical details of the lake and study the causes for its origin. China, however, denied visas to a fact-finding team from India to visit the spot of the lake formation, further fuelling speculation. The Pareechu lake incident highlights China's awareness regarding the environmental vulnerability of India.[84]

In a rising Asia, while sculpting a global vision, if there is a framework which convincingly captures the overall current scenario, despite the backdrop of strategic uncertainty, it is one of building bridges/synergies and deepening détente. This can be achieved by focusing on common grounds and by accepting that even as both nations are pursuing their respective national interests, the growth of each is based on accommodating the other's needs and emergence.[85]

Of late, the Government of India appears to have taken note of the laxity vis-à-vis the ramping up of logistics infrastructure, especially in the border

areas with China in Arunachal Pradesh and Ladakh. The Indian armed forces are presently seriously handicapped in the absence of all-weather roads in the states like Arunachal Pradesh and the region of eastern Ladakh, and have to depend on logistical support from the air, which is an expensive option.[86]

The Border Roads Organisation (BRO) is under directions to complete work by 2013 on at least eight roads termed 'strategic' in Arunachal Pradesh, of which four have yet to be completed. The BRO had been directed to complete construction of 608 kms of roads stretching from Ladakh to Diphu La in Arunachal, at a cost of Rs 992 crore ($203,000,000) by 2010.[87] As many as 75 roads with a total length of more than 6,000 km are now under construction at a cost of Rs 5,000 crore. Besides this, 7,000 km of roads costing Rs 12,000 crore are under various stages of construction in the northeast. The Special Accelerated Road Development Programme for the Northeast (SARDP-NE) project was divided into two phases: The first phase involving 1,300 km of roads, primarily in the northeastern states, to be completed by 2010; the second phase involves 5,700 km with a 2013 deadline.[88] Further, the Inter-Ministerial China Study Group proposed construction of at least 75 roads all along the border, of which 36 have been earmarked for Arunachal Pradesh alone.

While road construction is going on in the border regions, the Indian Air Force (IAF) has reportedly begun upgrading its Advanced Landing Grounds (ALGs) in Ladakh and Arunachal Pradesh. The IAF has built four air bases in Ladakh since 2008, with plans to upgrade such bases in Arunachal in a time-bound manner as well. It has been reported that India is also progressively reactivating old ALGs like the Daulat Beg Oldi, Phukche, Chushul and Nyoma airstrips in Ladakh. Similarly, apart from building new helipads and upgrading air bases, the IAF is also going to soon start basing its Sukhoi-30 MKI fighters in the eastern sector for the first time.[89] In fact, the government had cleared a plan to upgrade nearly 40 airfields all over the country, with most of them in the northeast, in an effort to maintain connectivity and strategic balance with China. Reportedly, these airfields are likely to be completed in the next five to seven years.[90]

Although C Raja Mohan contends that China's road-building is unlikely to lead to a military confrontation between the two countries, he believes that the current expansion of Chinese infrastructure in Tibet confronts India with a different set of challenges. For one, it brutally exposes the poor state of

transportation networks on the sub-continental side – the southern slopes of the Himalayas. Raja Mohan sates that the message from China is clear: on the frontiers, infrastructure is power in its broadest sense. In Nepal, for example, China has plans for six additional highways to link up with Nepal, besides the present one that runs through Kodari on the Sino-Nepalese border. Chinese plans are not limited to highways, but include the development of cross-border energy pipelines and optical fibre links in Nepal. The awful state of infrastructure on the border is the result, incredibly enough, of a deliberate policy in New Delhi over the last several decades, not to develop connectivity along the frontiers.[91]

DS Rajan, Director of the Centre for China Studies at Chennai, recalls that a few influential strategists in the PRC visualised what they termed a "partial war" with India, to recover "Southern Tibet" (the PRC's name for Arunachal Pradesh). For the same, China appears to have completed its military preparations to resolve the issue. The 14th Army of Chengdu MR could be stationed in Kunming (Yunnan's capital) and 80 percent of China's strategic bomber force is in the Lanzhou MR. The hardline stance on the Arunachal Pradesh issue being adopted at least by a section of Chinese strategists, ostensibly under an indirect government nod, contrasts with Beijing's present official position that China and India are no threat to each other and that the boundary issue can be solved on the basis of "mutual understanding and mutual accommodation" and dialogue on "equal terms."[92] This forces one to wonder whether China is deliberately blowing hot and cold on the border issue. A probable explanation could be that there are internal differences in China on the Arunachal Pradesh issue, between strategic and national security establishments, which give priority to national sovereignty on the one hand, and the diplomatic machinery, which accords primacy to a 'harmonious world' and 'peaceful periphery' concepts to suit China's modernisation requirements, on the other.[93]

India needs to invest heavily in developing infrastructure and transport links along the Sino-Indian border. China holds the benefit of heights, easier acclimatisation and superior airlift capabilities along the border. The initiatives discussed above will only supplement its power projection in the region. As the border talks continue, any potential lacuna in India's preparedness will make the country vulnerable to Chinese pressure. New Delhi should

work its way towards negotiating with the Chinese from a position of strength and not one of weakness, and for that, ramping up infrastructure build-up and preparedness is imperative. In fact, poor infrastructure is a key impediment towards an effective deterrence against China. During a field trip to Leh and the interiors of the Ladakh region in July 2009, this author had an opportunity to travel extensively across the mountainous terrain. During the course of numerous discussions that this author had with senior officers, there was a discernible consensus over the potential Chinese build-up that could take place by means of their RRFs. Theoretically, they could build-up within 48 hours; the Indian view, however, is that it would take much longer. Army officers in the region believe that, logistically, the Indian forces are comfortable; able to deploy adequate force levels, i.e., adequate resources are available for logistical support for a high-, medium-, or low-intensity conflict.

Nonetheless, it has to be noted that unlike the Line of Control (LoC), the Line of Actual Control (LAC) is not physically demarcated on the ground, including on military maps. Thus, when intrusions occur, it ruffles feathers, since it is complicated to determine which country the territory in question belongs to. Moreover, unlike Arunachal Pradesh, the situation is quite different in Ladakh (J&K). In the eastern Ladakh (Western Tibet) section, China has the capacity to begin the war with two to three divisions in minimal time and that, too, without much preparation. Reportedly, there is one airfield opposite eastern Ladakh; two RRFs are likely to be deployed there, both of which are armoured and mechanised heavily. Officers on the Indian side, however, are of the view that even if they are inside eastern Ladakh in 48 hours, the Chinese forces would require at least six to eight days to deploy and acclimatise. The Western Highway opposite eastern Ladakh is not all that smooth and convenient, as claimed by the Chinese.

Conclusion

The Chinese appear to be pursuing a well-orchestrated strategy of positioning themselves in a situation of advantage. The aim is to have an upper edge against India, especially by means of building and sprucing up logistics infrastructure. This was visible yet again when this author had an opportunity to travel across Sikkim in January 2010, and went up to the Nathu La Pass.

Unfortunately, here too, the condition of the Indian road infrastructure is not exactly up to the mark. Not only are the railway links underdeveloped, the roads, too, are yet to be constructed at many places and the existing roads are in a dismal state. On the contrary, China has built fantastic roads right up to the LAC in Arunachal as well as Ladakh, ensuring a smooth chain of supply and having an edge over its Indian counterparts. The infrastructure development is vital to bolster India's troop mobility and logistics supply in the forward areas, especially since some existing roads simply stop dead as far as 60-80 km from the LAC. From extensive interactions with Indian troops on the ground in these areas, this author found out that while Chinese trucks could drive right till the border in their vehicles due to their superb roads, Indian soldiers sometimes end up trekking 10-15 km to reach their border posts. Given the topography, the movement of men and materials is very costly and time-consuming on the Indian side. The shifting channels of the Lohit and other rivers in the northeast, often on a day-to-day basis, further hamper movement.

China's massive infrastructure build-up in Tibet is causing concern to the Government of India. Speaking during the question hour of the Lok Sabha in the Budget session of Parliament in March 2011, Defence Minister AK Antony highlighted the rapid development of rail, road, airfield and telecom infrastructure and military camps being undertaken by the Chinese authorities in Tibet. Antony acknowledged that a road network stretching across 58,000 km, coupled with five operational airfields at Gongar, Pangta, Linchi, Hoping and Gar Gunsa has come up in Tibet. Besides, extension of the Qinghai Tibet Railway (QTR) railway line to Xigaze, and another line from Kashgar to Hotan in the Xinjiang Uighur Autonomous Region, is also in progress. Effectively controlling the Tibet Autonomous Region (TAR) is crucial for China's security as Tibet comprises approximately one-fourth of China's land mass. In the wake of ethnic violence in Tibet in 2008, increased force levels of the paramilitary People's Armed Police (PAP), Chinese Frontier Guards and the Garrison Duty Forces have been stationed in the region. Without the logistical capabilities to meet such demands, the PLA would be unable to undertake military operations at and above the campaign level. The rapid and concentrated expansion of infrastructure in Tibet has improved the PLA's capability to rapidly induct integrated forces. The extensive development of

logistics infrastructure in the TAR indicates that impetus is being given to the PLA's logistics capability, which, in turn, will enhance its operational capability in the TAR to take on both internal and external security threats.

Construction of the new airfields and the upgradation of advanced landing grounds (ALGs) and helipads in and around the TAR, coupled with the acquisition of new transport aircraft, will enhance China's strategic airlift capability, resulting in faster induction and concentration of field formations in comparatively shorter time-frames and, consequently, over shorter warning periods. The construction of airfields and ALGs closer to Indian borders boosts the PLA Air Force (PLAAF) fighter aircrafts' striking range and provides PLAAF the ability to strike and engage targets in India on a broad front and in depth. All PLAAF units in the TAR are connected by satellite communication. Chinese Sukhoi-27UBK fighter aircraft are being reportedly deployed in the Chengdu Military Region (MR). Besides Su-27, Sukhoi-30MKK fighters have also practised operations in the region recently. Significantly, fibre optic communication is being steadily extended towards military installations along the Indian borders. The inter-connecting of Chengdu and Lanzhou MRs with one another, and both these MRs to Beijing, through secure communications has ensured enhanced real-time command and control. Another major infrastructure development is the construction of new missile bases in Tibet. According to recent reports, China has placed advanced Dong Feng-21 (DF-21/CSS-5) medium-range ballistic missiles (MRBM) along the borders it shares with India. During a future conflict with India, the PLA could easily move 500 to 600 mobile ballistic missile launchers to bases close to the Indian border from their current deployment opposite Taiwan.

Complexities of the Tibetan terrain, vagaries of climate, and sustenance capacities of the thrust lines chosen, are all factors that influence the depth of operations that are being planned. To address this aspect, the PLA is reportedly constructing Hyperbaric Chambers to facilitate the rapid acclimatisation of troops brought in from lower altitudes. It is also building the first batch of oxygen-enriched barracks using plants for troops in the TAR at the Nagchu Military Sub-Command at an altitude of 4,500 metres. Extensive development of logistics infrastructure in the TAR is central to China's 'Great Western Development Strategy' and, simultaneously, a

categorical forewarning to neighbouring countries about its growing military capabilities. In 10 to 12 years, the PLA will be able to induct, deploy and sustain a much larger quantum of forces in Tibet and will outnumber Indian troops deployed across the Line of Actual Control several times.

In the latest attempt to score a political point, China's handpicked 11th Panchen Lama arrived at the Labrang Monastery situated in the quaint town of Xiahe in the north-western Gansu Province in August 2011 amid much speculation and discomfort among the local monks, given the intimidating Chinese police presence around him. The CCP has made every effort to raise the profile and acceptability of its chosen candidate, Gyaltsen Norbu, ever since 1995. Having spent a considerable part of his life in Beijing, Gyaltsen Norbu has been appointed to the Chinese People's Political Consultative Conference. The motive behind the visit of the Chinese Panchen Lama is a broad understanding within the cadres of the CCP that a stint at one of the prominent monasteries would result in greater acceptability and legitimacy.

The Panchen Lama is considered the second most significant religious figure in Tibetan Buddhism. As of today, the 1,000-strong Labrang monastery's loyalty rests with the reincarnation of the 10th Panchen Lama, Gedhun Choekyi Nyima, chosen by His Holiness the Dalai Lama in 1995. Not much is known regarding the latest whereabouts of Gedhun Choekyi Nyima, since he was whisked away by Chinese authorities under the garb of providing "protective custody" many years ago. The political contest vis-à-vis Tibetan future is only likely to intensify as the newly-elected Prime Minister of the Tibetan government-in-exile, Lobsang Sangay has asserted his resolve to reach out to the Chinese authorities to resolve the Tibetan issue peacefully, based upon "mutual interests."

Given that the TAR constitutes nearly one-fourth of China's land mass, its security implies securing China's western frontier. Primarily, China is well on its way to follow Sun Tzu's proverbial maxim, "For to win one hundred victories in one hundred battles is not the acme of skill ... to subdue the enemy without fighting is the acme of skill." Infrastructure build-up and advancing military capabilities in Tibet by China goes well beyond the genuine needs of Tibet or the Tibetan people and amounts to power projection in the wider sense. Beijing seems to be leaving no stone unturned to ensure that it emerges victorious in this high-stake battle, be it politically or militarily.

It is in the Indian interest to upgrade the logistics infrastructure in the states bordering Tibet to facilitate the rapid reinforcement of sectors threatened by the Chinese during any future conflict. Simultaneously, India should enhance its intelligence, surveillance and reconnaissance (ISR) capabilities to maintain all-round vigil on the border. The army and the air force must also upgrade their firepower capabilities by an order of magnitude so as to engage and destroy PLA forces at a distance. It needs to be remembered that effective defence does not come cheaply. There is a saying that one mountain cannot accommodate two tigers; surely, China appears determined to remain the lone Asian tiger in the region. Even though China claims that its rise is peaceful, around 15 years from now, that just might not be the case. The need of the hour for New Delhi is to put in place, and thereafter, execute an exhaustive plan to develop, on a war-footing, its own connectivity along and across the long frontier with Tibet, and close the ever-widening 'infrastructure gap' with Beijing.

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