

Infrastructure Development and Chinese War Waging Capabilities in Tibet

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China has created world class infrastructure on the Tibetan plateau in terms of highways, rail links, airports, logistic installations and oil pipelines which have civilian as well as military usage, allowing China to settle its Han majority population into these sparsely populated areas, project power in Central and South Asia, and make sustained efforts to integrate these alien areas. These unprecedented infrastructure developments have significantly multiplied the war waging capabilities of China, including against India. The over-reaching Chinese military, security and economic ambitions have ensured the transformation of once buffer state of Tibet into another Chinese province where infrastructure clearly exceeds the current demographic and security requirements. From these massive infrastructure developments in Tibet and the neighbouring regions, which have been objectively documented in this article, it is evident that China now intends to pursue its strategic interests on its western borders.

"If a gun is introduced in Act I, it will be used in Act III." - Anton Chekhov

The Chinese are not known for halfhearted efforts, particularly when in the words of *The Economist*, they have experienced "The most dynamic burst of wealth creation in human history"¹. China's sustained territorial control over the culturally and ethnically alien border regions of Xinjiang and Tibet are today supported by massive infrastructure improvements and an enhanced security presence. In particular, Tibet has been transformed from a remote mountain kingdom of incarnate lamas into a land criss-crossed by high-speed trains and wide highways. China has created world class infrastructure on the Tibetan plateau in terms of highways, rail links, airports, logistic installations and oil pipelines which have civilian as well as military usage, allowing China to settle its Han majority population into these sparsely populated areas, project power in Central and South Asia, and make sustained efforts to integrate these alien areas. Evidently, these infrastructure developments will significantly multiply the power projection and war waging capabilities of China towards the west, including against India. Thus,

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these developments are of much concern in India due to our unsettled borders with China as the ground over which the Chinese armies descended on India in 1962 is again humming with PLA activities. It still needs to be seen whether the Chinese infrastructure development is intrinsically aggressive in design or simply a manifestation of a rising China which intends to project adequate power and influence in South Asia and the energy rich Central Asia.

Key Surface Infrastructure Developments

From 1950, and in particular after the 1959 Revolt, the Chinese became acutely aware of the strategic importance of Tibet. As the People's Liberation Army (PLA) marched into Tibet, simultaneously it began to construct roads. The strategic development in Tibet continued for over 20 years and by 1976 China's basic strategic requirements had been completed. Thus, the most spectacular aspect of development in Tibet from 1951 to the present has been strategic or military.² During the first five- year plan (1953-1957), China spent US \$ 4,232 million on "transportation and communications" (supposedly for the whole country), which constituted 11.7 per cent of the total development expenditure.³ There is evidence to suggest that a large chunk of that total amount went for building roads into or in Tibet.⁴ By 1965 two highways effectively linked Lhasa with interior China. And by 1975 China had completed 91 highways totaling 15,800 Km, with 300 permanent bridges in Outer Tibet alone, by which 97 per cent of the region's counties were connected by roads.⁵

As much as 90 per cent of the budget of the provincial government in Tibetan Autonomous Region (TAR) is subsidized by Beijing. In the period from 1950-99, the Chinese Government spent over Yuan 40 billion on construction activities and financial subsidies for Tibet. In 1994, the 62 aid projects which were launched with a total cost of Yuan 4 billion received 75.7 per cent of this investment from Beijing. Tibet also received Yuan 69 billion (US \$ 8.5 billion) in fixed asset investments between 2001 and 2005 - three times as much as in the previous five-year period. About Yuan 50.8 billion of this investment was appropriated from the central coffer to boost infrastructure construction in the region.⁶ In the Tenth Five-Year Plan (2001-2005), an outlay of 270 billion Yuan (US \$ 33 billion) was kept for various railway projects in China. Approximately 100 billion Yuan (US \$ 12.5 billion) of this was spent in the 'western regions', including Tibet.⁷

In January 2010, the Tibetan Review reported that as per the 3rd Session of the 9th Tibet Autonomous Regional People's Congress, held on 10 Jan 2010, Tibet's all "180 projects" started construction in 2009, except for the Lhasa-Xigaze railway project which is pending approval from the central government.⁸ The report said

the “180 projects” referred to the number of infrastructure projects that the central government and the State Council (China’s cabinet) had resolved to carry out in the TAR during China’s Eleventh Five-Year period in order to enable the region to make a leap forward in development. The projects were reported to involve a total investment of 109.76 billion Yuan, with 77.88 billion Yuan was set to be invested during the ‘Eleventh Five-Year period.’⁹ It was also leant that 100 of the 180 projects had already been completed.

The Chinese government, in July 2010, commenced another massive effort to enhance their surveillance capabilities and the air and rail infrastructure in Tibet and Xinjiang. The completion of these infrastructure enhancements including seven new airports and 8,000 km of railway lines will further widen the existing asymmetry in border infrastructure between the PRC and its neighbours, including India. China’s National Committee on Border and Coastal Defence (NCBD) in January 2010 had earlier pressed the government to speed up infrastructure development in border areas in Tibet and Xinjiang.¹⁰ The NCBD also told China’s top leaders that the PLA was close to finishing work on its plan to build a “digital great wall” along the borders in Tibet and Xinjiang. The digital wall is a network of fibre optics which will improve the PLA’s command control structure and communication. Last year, with the setting up a new sentry post in Medog County of the Nyingri Prefecture in the TAR, the infrastructure for the nation-wide surveillance system had been put in place.¹¹ The Chinese have ambitious plans for the future. By 2030-50, two more train links will connect Tibet with mainland China and Xinjiang and Tibet will have over 60 airfields. The scale and velocity of any Chinese build-up has already gone up by a factor of over 120 per cent.¹²

The Trains Beyond Lhasa

The Qinghai – Tibet Railway (QTR) has almost become a lifeline of Tibet. China has already build settlements with Han population every 60 km of this vital 1,118 km long railway. These Han settlements are intended to be used for monitoring, repairs and reconstruction in case of Tibetan guerillas attacking the railway line. Meanwhile, China is already using Bell 206 L helicopter for sky patrols and aerial photography over this vital link. QTR has been a part of a concerted effort to improve the rapid deployment capability of the integrated forces, particularly the ability to quickly manoeuvre heavy equipment. QTR has bearing on movement of Chinese nuclear forces as well. It has enabled China to readily transfer Intermediate and Intercontinental range ballistic missiles to the Indian borders, if needed. QTR will also enable the deployment of recently developed rail car missiles, the DF-31A, on the Tibetan border with India. This missile is similar to the Ukrainian-built SS-24S.

In the next ten year, the Chinese government has planned to invest US \$ 1.2 billion in construction of new railway lines in Tibet. China has already commenced construction on a southward extension of the QTR in October 2010. This construction will connect the two most important cities of Tibet i.e. the Tibetan capital of Lhasa to the second largest city of Tibet - Xigaze (also called Shigatse in Tibetan). This 253 kms extension in the southwestern part of TAR is expected to up to four years and shall cost 13.3 billion Yuan (US \$ 1.98 billion). The extension will be presently a single line permitting a train speed of up to 120 km per hour. The new section will pass through five counties and over the 90-km long Yarlung Zangbo Grand Canyon, to reach Xigaze, the traditional seat of the Panchen Lamas.¹³ From Lhasa - Xigaze line, an extension will be made to Yatung (also called Dromo), situated in the mouth of the Chumbi valley, near Nathu La, close to Sikkim and Bhutan borders. In addition to the Lhasa - Xigaze extension, the other proposed extension is from Lhasa to Nyingchi (Kongpo) in the southeastern part of Tibet along the Yarlung Tsangpo River (Brahmaputra). According to the media reports, the construction will begin in 2013.¹⁴ Nyingchi is strategically located just north of Arunachal Pradesh and the Chinese claim that the Nyingchi (or Nyangtri) Prefecture includes some parts of Arunachal Pradesh. This railway would then run to Kunming, in the Yunnan province.¹⁵

Nyingchi is incidentally the area where the Chinese propose to divert Yarlung Tsangpo River northwards by building the largest dam in the world as here the river (Brahmaputra) takes a decisive turn at the Great Bend and flows towards India. The proposed rail link at Nyingchi and other massive infrastructure developments in proximity of the Great Bend do not inspire confidence. Strategic affairs expert Brahma Chellaney describes the rail link to Nyangtri as a significant new development. "The building of the railway to this area is significant because of two reasons: China has unveiled plans to construct there the world's largest dam which will be more than twice bigger than Three Gorges Dam, now the world's largest dam, and also because it will strengthen China's rapid military deployment capability in the eastern (Arunachal) sector."¹⁶

Further north, the Korla - Lanzhou - Chengdu railway line is likely to be converted into a double track. The eastern link from Chengdu to Lhasa via Ngiti, Pangta and Markhan Dzong is likely to be completed by 2015. The Chengdu Military Region (MR) has two Group Armies, one artillery division and two tank brigades on its Order of Battle (ORBAT). Incidentally, the 13th Group Army, which is also nominated as a Rapid Reaction Force (RRF), and the 14th Group Army, located in Chengdu, are often called "monkey troops" in China. They are trained to rapidly climb mountains and are very amenable to weather conditions.¹⁷ Of further significance are the

three other railway lines which are expected to materialize in near future. These proposed lines are on the Sichuan route, Yunnan route, and the Kam - fu to Tibet route. These will facilitate rapid Chinese logistic buildup both opposite India's North East and along the Sino-Myanmar border. The double gauging of the railway line from Lanzhou to Golmud will extend the reach of the Lanzhou MR, which in turn will enhance the Chinese operational logistic capability.

As for high-speed railways, from a standing start, China's railways are now the world's fastest and longest. The government has plans to roll out a high-speed network across Asia and even Europe.¹⁸ It proposes three main routes to connect two dozen countries, from Singapore in the south to Germany in the west (with a tunnel from mainland China to Taiwan). By 2025, if the railway ministry is to be believed, it will take two days to travel from Shanghai to London.¹⁹ During the visit of Pakistan's President Asif Ali Zardari to China in July 2010, the two countries agreed to accelerate plans to build a railway line from Xinjiang region to Havelian, through the disputed Gilgit-Baltistan region. The pre-feasibility study for the same has already been conducted in 2004.²⁰ Going by China's track record, all these expansion plans will be implemented. It is noteworthy that China has added 20,000 km of railway tracks over the last two decades, compared to merely 860 km by India in the same period. Overall, China will now spend US \$ 513 billion just on railways in the next three years. This is higher than what India's Planning Commission has in mind, over five years, to plug the entire infrastructure deficit in the country.²¹

The QTR Implications

Although estimates vary, it is estimated that the QTR gives China the capability to mobilise up to 12 divisions in a month's time frame. It also enables it to transfer telecommunications and other command and control facilities which are needed to deploy missiles from launches at a chosen place. Reliable rail links from Lanzhou to Kashi and Lhasa will facilitate easy switching of reserves and logistic resources between Chengdu and Lanzhou MRs bordering India. The QTR has already reduced the travelling time for troops from Golmud to Lhasa from approximately 72 hours to merely 16 hours. Chinese troops were being transported on this rail network to Lhasa in December 2007, signifying its use for military purposes. The Xinhua News agency has cited unnamed sources in the PLA stating that the railway would become "a main option" for transporting soldiers.²² Srikanth Kondapalli has underscored the Chinese intent vis-à-vis Tibet by stating that there are 30 regiments of PLA stationed at Golmud which can use the railway line and reach Lhasa, Xigaze and other feeder lines. The Chengdu - Lhasa line can bring in five more PLA divisions to the border.²³

The QTR will permit easier move of larger and more capable ballistic missiles into TAR. It is approximated that presently tunnels constitute up to 2.18 per cent of the 1,118 km long railway. It may be noted that even after the completion of the construction of these tunnels, they were not used for many months, which induce the likelihood, that some of these tunnels are probably being used as missile bases. The completion of QTR may therefore be followed by deployment of such missiles in the TAR, so as to be able to cover longer range targets in South Asia and the Indian Ocean Region. 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 will also minimise the vulnerability of the lines of communication besides reducing dependency on other means of communication.

The Highways of TAR

China has developed a network of internal highways and subsidiary / feeder roads in TAR to connect all strategic and important places on the borders with India, Nepal, Bhutan and Pakistan by motorable roads. It may be noted that about 42,700 kilometers of highway has been opened to traffic from 2001 to 2005. Presently 80 per cent of Tibet's townships and nearly 20 per cent of villages are accessible by highways. However, PRC has planned to build additional roads in TAR, which will then link 92 per cent of the TAR's towns and 70 per cent of its administrative villages. The PRC is expected to spend Yuan 20 billion in the next few years, mainly on construction of 103 highway projects.

In the last ten years, more than 1500 km of highways have been black-topped. This includes the Quxu-Xigaze section on the China-Nepal Highway, the airport road from Lhasa to Gonggar airport and the section from Qamdo to Bamda airport. Approximately 80 per cent of highways in Tibet are well maintained, and higher capacity vehicles are now being introduced.²⁴ The up gradation of the Qinghai – Tibet Highway (Central Highway / Highway 214) from Xining to Lhasa, which commenced in 1991, has been completed. Between Lhasa and Yangbajain, for a distance of 90 km, it has been developed into a four lane highway, and has been black-topped in patches. This stretch of highway remains open throughout the year. A major renovation project for the Central Highway, costing Yuan 1.17 billion (US \$ 140 million), has been undertaken to accommodate increased traffic. On the Sichuan –Tibet Highway (Eastern highway / Highway 317) there has been up gradation of the 400 km stretch from Lhasa to Ngiti (opposite Arunachal Pradesh) wherein this portion has been black-topped / asphalt surfaced and improved. This will improve lateral mobility between Central and Eastern TAR. The Chinese

government has earmarked Yuan 5.3 billion for improving the 573 km stretch of Sichuan-Tibet Highway along with six regional highways and the 3,000 km road leading to local counties and villages.²⁵ China has also started construction of the first express highway on the Tibetan plateau from Xining to Tsongkha Kar, forming part of the Xining-Lanzhou Expressway.

China is now spending Yuan 5.7 billion to build a secondary road linking Weixita city in Yunnan and Deqin (Dechen in Tibetan) County to improve connectivity into TAR. This new / second Yunnan road will also keep the traffic open for Deqin County even in winters.²⁶ In addition, a second all-weather road to Nepal is being constructed connecting Kyirong pass through Rasuwa to the road head at Syaburbensi in Nepal. Presently, the construction of 17 km long stretch from the border to the Nepalese town of Syaburbensi is being carried out which has cost Beijing US \$ 20 million. But it is considered an important investment because this mountain pass not only connects Tibet to Nepal – it is also the most direct land route to the Indian plains.²⁷ China is also working on a war footing to build a new city in Kerung valley in Tibet.

China has announced plans to widen the Karakorum highway, which links China to Pakistan through Pakistan occupied Kashmir (PoK), from the present 10 metres to 30 metres. This will permit heavy vehicles to use it throughout the year. In July 2010, the Chinese government signed a US \$ 525 million deal to help Pakistan build two more highways in the PoK region. The Memorandum of Understanding (MoU) was signed between the two countries during the visit of Pakistan's President Asif Ali Zardari to China. China agreed to build a 165 km-long highway between Jaglot and Skardu, and a 135 km highway between Thakot and Sazin in the disputed Gilgit-Baltistan region.²⁸ The suspicions that China's army is now securing its land route to the Arabian Sea via the PoK have further grown, given that China has also wrested control of the Gwadar port back from the Singaporean Port Authority.²⁹ Overall, within Tibet and the neighbouring regions, the Chinese focus seems to be on construction of inter-provincial highways which link the interior and coastal regions and certain trunk rail lines. All of these are being built to military specifications which will enable PLA to use them in case of a war. During the Eighth Five-Year Plan, for example, more than 50 national highways were built or renovated to military standards, including the three roads leading into Tibet.³⁰

Communication and IT Infrastructure

China has now extended its Advanced Info-Optical Network (CAINONET) project to Tibet. In addition to this extension, a total of 58 very small aperture terminal (VSAT) satellite stations have been installed in TAR and all PLA units and

subunits have been connected by satellite communications. The plan to connect all cities and counties of the TAR by 2005 also seems to have been successful as the Chinese are reported to have laid a fibre optic network in all the 55 counties of TAR, which includes Ali, and the border areas of Chamdo. A total of 1,100 km of optical fibre cable (OFC) have been laid, connecting Lhasa with Nyingchi and Qamdo counties in the east TAR. A large number of PLA units had participated in laying these OFCs.³¹ 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. This will ensure secure and real-time military communications in case of any operations. OFC is also being steadily extended towards the military installations along the borders. All military supply depots (MSDs) are now connected to Lhasa by radio and OFC.³² The total number of fixed telephones in the TAR has now reached 1,50,000 with a mobile phone capacity of 85 channels. Similarly, the number of mobile phone users has reached a figure of 1,13,000. 3G mobile service is now available in the TAR. For future operations, real time connectivity will be achieved by the PLA and a quantum jump in communication technology and command, control, communication, computers, intelligence, surveillance and reconnaissance (C4ISR) will be much evident.

Logistic Installations

The construction of the Lhasa Railway Oil Terminal Project, which has an investment of 180 million Yuan and 38,000 cubic meters of storage capacity, began on 8th June 2010. After the construction is completed, the oil terminal will have an annual oil turnover of 400,000 tons and can meet Tibet's demand for refined oil products, mainly gasoline, diesel and aviation kerosene. Meanwhile, it will also end Tibet's historical lack of a railway oil terminal in the region. According to Wang Jun, General Manager of PetroChina Tibet Marketing Company, the project will secure an adequate supply of refined oil products in Tibet, reduce transportation costs, relieve the pressure of oil products transportation and fully make use of the advantages of the QTR. The project is expected to finish construction and begin operations by the early 2011.³³ Chinese logistical capabilities in Tibet again received a big boost when the biggest logistic centre in the TAR was completed in June 2009. It is located in Nagqu Township of Nagqu County in northern Tibet, next to a railway station at an altitude of 4,500 meters, and is expected to handle 2.23 million tonnes of cargo by 2015 and 3.1 million tonnes by 2020.³⁴ Since the centre is situated about 300 km northeast of the regional capital Lhasa, this project is expected to further exploit the potential of the QTR and boost the region's economic development. Construction of this logistics centre cost China approximately Yuan 1.5 billion (US \$ 220 million).³⁵

The Air and Missile Infrastructure

Air Infrastructure

Out of about 15 airports on the Tibetan plateau, there are five major airfields in Tibet which are now open for civilian activity. The main airfields in Tibet are at Gongga, Donshoon, Hoping, Bangda, Nagchuka and Shiquanhe, and the recently opened civilian airports. The Gongga and Bangda airfields are presently being upgraded to handle 1.1 million and 1.0 million transients respectively, totaling to 2.1 million transients per year. The construction of Nymgtri airport (Linzhi) located in the southeastern TAR was one of the key projects completed in the Tenth Five Year Plan. It was made operational in July 2006. This has added capacity of handling an additional 1,20,000 passengers per year in Tibet. It is situated near Nyingtri in Nyingchi Prefecture, which shares borders with India and Myanmar.³⁶ Construction of an airfield at Bayixincun in central TAR is also being pursued. In addition, another major infrastructure development project involving 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 Yuan 650 million, is underway which will reduce the travelling distance between Lhasa to Gongga International airport from 98 to 53 km.

On 30th October 2010, an Airbus A319 smoothly landed at Xigaze Airport, marking the opening of Tibet's fifth civil airport. Xigaze airport is Tibet's key construction project of the 11th Five-Year Plan constructed at the cost of approximately 532 million Yuan. Xigaze Peace Airport, located in Xigaze Prefecture, 48 km from Xigaze City, is 3,782 meters above sea level and has a terminal area of 4,502 square meters.³⁷ It is designed to meet the demand of a passenger throughput of 230,000 by 2020 as well as a cargo and mail throughput of 1,150 tons.³⁸ The sprawling Xigaze prefecture shares land links with Nepal, Indian and Bhutan borders. Earlier, in July 2010, the Chinese government had opened the fourth airport in Tibet in the north-west Ngari Prefecture. This airport at Gunsu cost US \$ 249 million and was Tibet's fourth civil airport after Lhasa, Bangda in Qamdo Prefecture and Nyingchi. It was also informed in the 3rd Session of the 9th Tibet Autonomous Regional People's Congress in January 2010 that a trial flight at the Elikunsha Airport (Ngari airport) has succeeded and the renovation and expansion of the Qamdo Bangda (i.e. Chamdo-Pomda) Airport was also completed.³⁹

The Chinese Press recently reported the construction of the 'world's highest airport' in Tibet's Nagqu Prefecture – at an elevation of 14,639 ft, which is being budgeted under the 12th Five-Year Plan (2011 to 2015). The Nagqu Dagrang Airport is scheduled for completion in 2014. The airport is part of a Chinese government development scheme to build 97 airports across China by 2020. China will also

launch Tibet Airlines in mid-2011 with a registered capital of 280 million Yuan (US \$ 41.2 million) and 20 aircrafts. The airline will be the first Chinese airline to be based in the TAR.⁴⁰ Boeing aircraft are being specially modified to meet the high-altitude requirements of operating in TAR. The China Southwest Airline is presently operating on 10 domestic and one international air routes in Tibet. While the domestic air routes are Lhasa to Beijing, Chengdu, Shanghai, Chongqing, Xi'an, Guangzhou and Xining; the international route is from Lhasa to Kathmandu. As per Chinese statistics, the greater number of tourists and businessmen visiting TAR has led to an annual increase of 20 per cent in air traffic in the recent years. These increases in civil air traffic of TAR will progressively enhance PLA's air induction capability into TAR by utilizing the increasingly available civilian aircrafts.

The PLAAF is in process of creating assets, including building new airfields, to relocate some of its assets permanently to the Tibetan plateau. These new airfields can support fighter aircraft and also have the capability of airlifting a division, air drop a brigade and helicopter lifts of approximately two battalions.⁴¹ Su-27s have been already deployed in the Chengdu MR and there are reports of their deployment in Tibet for short durations from other airbases. Recently, China has constructed 27 military airstrips in Tibet. It is also upgrading airstrips at Kashgar, Yarkand and Tashkurgan in western Tibet, Tingri in central Tibet and Doonshon, Kangbo, Chamdo and Pahari Dzong in the eastern Tibet.⁴² These bases give the Chinese air force control of Tibet's air space, the forward edge of battle in the event of war with India, and the capability to fly sustained combat operations over India's north and strike all India's northern cities. The high altitude of the airfields in Tibet is frequently suggested as precluding effective PLAAF air operations against India. The PLAAF may be able to overcome this problem through aerial refueling, with strike aircraft taking off from lower-altitude airfields further away, and refueling over Tibet for strikes at airfields or other targets in northern India.⁴³ It is for these reasons that PLAAF has purchased additional 18 IL-78 aircraft for developing the existing air-to-air refueling capability and reportedly, 22 more IL-78s are in pipeline.

TAR and the Missile Game

The growing militarization of the TAR have deepened world's concerns over Chinese military capability after the PLA's Second Artillery Corps (SAC) began positioning a variety of sophisticated missiles in the Himalayas. Over the years, liquid fuel missiles such as the Dong Feng (DF) - 4 that required longer preparation time for launch have been replaced by more sophisticated solid fuel medium-range ballistic missile DF-21 (single warhead of 200-300 kilo-tons yield), which can hit targets at a distance of 2,150 kilometers.⁴⁴ These missiles are mainly

located at the Delingha site in Haixi Mongol and Tibetan Autonomous Prefecture in Qinghai, which is about 2,000 km from New Delhi and are under the command of 812 Brigade of the SAC.⁴⁵ In fact, the discovery of this site drew worldwide attention when new satellite pictures showing 58 launch pads and command and control facilities spread over a 2,000 sq km deployed in the northern parts of Qinghai province on the Tibetan plateau were made public in 2009. The Chinese launch sites at Delingha are in an area that for years has been considered to be a deployment area for liquid-fueled DF - 4 long-range nuclear ballistic missiles.

Earlier in November 2006, Federation of American Scientists (FAS) and Natural Resources Defense Council (NRDC) had published Chinese Nuclear Forces and US Nuclear War Planning, which used satellite images to describe the two launch sites at Delingha.⁴⁶ But now in these sites, numerous new buildings had been erected, the access roads paved, work appeared to be in progress next to the underground facility, and six 13-meter trucks that resemble launchers for the DF-21 MRBM were clearly visible on the launch pad. Considering the dozen 13-meter trucks visible on the satellite images at Delingha to be indeed DF-21 TELs, then 32-35 per cent of China's estimated inventory of DF-21 launchers are deployed in this area.⁴⁷ From Delingha, with a range of 2,150 kilometers the DF-21s would not be able to reach any US bases, but they would be able to hold at risk all of northern India.⁴⁸ Moreover, DF-21s would be within range of three main Russian ICBM fields on the other side of Mongolia: the SS-25 fields near Novosibirsk and Irkutsk, the SS-18 field near Uzbur, and a Backfire bomber base at Belaya. Whereas targeting New Delhi could be considered normal for a non-alert retaliatory posture like China's, targeting Russian ICBM fields and air bases would be a step further in the direction of a counterforce posture.⁴⁹ Thus, this deployment enhances the power projection capability of China in Central Asia which was earlier a Russian domain with some US influence.

More missile sites are proliferating in Tibet. There are missile sites in Tsaidam at Terlingkha and the headquarters of a missile regiment in Amdo bordering Sichuan.⁵⁰ There is also other DF-21 missile site located at Kunming in the Yunnan province.⁵¹ Moreover, China now has a potent long-range missile inventory of DF-31 and DF-41 ICBMs that can strike targets at 6,000-10,000 km. In its annual report in 2009, the US Defence department said that to improve regional deterrence the PLA has replaced older liquid-fueled, nuclear capable DF-4 (CCS-3) intermediate range missiles with more advanced and survivable fueled DF-21 (CSS-5) MRBMs. China has moved new advanced longer range CSS-5 missiles close to the borders with India and developed contingency plans to shift airborne forces at short notice to the region.⁵²

Impact on War Waging Capability

The infrastructure developments in rail, road and air provide two distinct advantages to China, i.e. capacity building, on the one hand facilitates the movement of men and material to critical sectors on the northern and eastern borders; on the other hand, it provides the Chinese a transportation infrastructure to open up Tibet's market, and to use trade and transit as leverage to spread their influence into some of the neighbouring countries. The improvements in infrastructure will speed up induction timings, increase buildup and logistic sustenance capability in the TAR up to major townships. Movement will not be necessarily restricted to day time, as in certain areas, night movement will also be possible by train. In August 2010, the official PLA Daily reported that PLA has begun transporting "combat-readiness materials" through the QTR. The report stated that in mid-summer, a train loaded with important combat readiness materials for the PLAAF got to the destination safely," and added that was the first time that the railway had been used to boost logistical support for the PLAAF.⁵³

New townships, built-up complexes and barracks/buildings along the highways could be used for stocking, which would mean increased capability to sustain additional force levels, when inducted. The modernisation of the communication network in terms of fibre optic cable and satellite communication indicates an up gradation of the command and control elements capable of conducting operations effectively and sustaining increased force levels in the future. Tactical / strategic missiles can be moved up and preserved in the TAR, thus maintaining surprise and deception, besides achieving increase in engagement ranges covering complete India, South Asia and much of Central Asia. According to the movements picked up by the US KH-11 satellites, the QTR is already being used to move missiles into TAR.⁵⁴

Tibetans – The Last Priority

Many of these infrastructure developments are being explained by the Chinese in terms of the Western Development Campaign which has been ostensibly launched to bridge the economic gap between the rich coastal regions and the remote provinces of Tibet and Xinjiang. However, the launch of this campaign may be seen as opportune in light of China's World Trade Organisation (WTO) accession: China's plan to 'develop' its west is an old one which heretofore could not be implemented mainly due to lack of capital and technology. It now aims to do that in collaboration with Western businesses, or more appropriately, by using their capital and technology. Tibet has been the key focus of the Great Western Development Campaign. Official statistics show Tibet Autonomous Region's GDP growth averaging 12.8 per cent per annum from 1994-1995 onwards.⁵⁵ But little known is the fact that a substantial part of TAR's GDP figures are investments on

large scale infrastructure and fixed assets, which are not based on local needs. What may be really needed are investments in education and health services as TAR's human development index is the poorest among China's 31 provinces.⁵⁶ Thus, Beijing's primary economic objective of investment in Tibet is to exploit its rich natural resources.

Relevance for India

In March 2010, the (Indian) Ministry of Defence, in its annual report conceded that rapid development in Tibet and Xinjiang has given the Chinese military strategic operational flexibility in the region.⁵⁷ It is assessed that in TAR, the road infrastructure alone has a combined capacity of 1,15,000 metric tonnes, thus facilitating easy and swift movement of men, material and facilities. The issue that is of specific concern to India is that this infrastructure build up in terms of roads, railway network and airports flaunts capability and readiness without having to physically deploy forces. Chinese strategy appears to be that of connecting Eurasia to China and in the process enhancing the war waging capability of the PLA in the TAR.⁵⁸

Strategically speaking, it is apparent that the Chinese are developing infrastructure not just to put pressure on India but also to enhance their offensive capability and thereby keep their options open for opening a second front against India. Already, the number of camps coming up in the region bordering India has crossed 150, as picked up through available satellite imagery. These are in addition to the logistic nodes that have been established for the supply of ammunition.⁵⁹ The extensive infrastructure development in TAR would also provide round the year stocking capability by rail, road and air. This, to some extent, would mitigate the restriction of stocking to the so-called operational seasons, limited as of now to 4-5 months in a year. Presently, China has no major constraints in inducting the required forces, using the optimum capacity of five highways, railways and air infrastructure up to the major townships in TAR. No additional acclimatization time is required since induction in TAR is spread over a long time. The restrictive factors for force application are only deployability and logistics sustainability at the point of application.


Military Exercises

2009 possibly will be worldwide known as the year when China began to flex its muscles in places other than Taiwan. Perhaps the Deng Xiaoping era of "hide your capabilities, bide your time" was over. In 2009, there were a series of 23 major exercises culminating in the large scale military exercise called "Kuayue" (Stride 2009). Four divisions from four different MRs of China, viz; Lanzhou, Jinan,

Guangzhou and Shenyang, took part in this exercise. All previous military exercises have focused on Taiwan and rehearsed for an amphibious assault. This was the first major exercise not focused on Taiwan but on overland military operations against possible adversaries like India and Vietnam. The subject exercises were conducted at altitudes above 4,700 meters and involved fighter aircraft, attack helicopters, artillery, tanks and electronic warfare units, including a new generation of Jian -11 fighter jets, 'Red Flag-9' air defence missiles (Hangqi-9 SAM) and 96B main battle tanks.⁶⁰

Overall, Exercise Kuayue was an ominous warning signal to both India and Vietnam, as well as the Philippines, Malaysia and Thailand, that the expeditionary capability now rendered surplus from Taiwan could easily be employed elsewhere.⁶¹ The exercises also reflect the effectiveness of the newly developed Chinese infrastructure, which now permits PLA to quickly deploy troops at significant distances. In fact, on 2nd Nov 2010, the South China Morning Post, Hong Kong, citing military analysts, commented that the Chinese army's conduct of its first live-fire drills involving both army and PLAAF on the Tibetan Plateau were especially aimed at India.

Conclusion

"In fact, modernity breeds stability, but modernization breeds instability." - Samuel Huntington China believes that infrastructure development is a basic prerequisite for theatre development, as well as encouraging the Han population to settle in sparsely populated Tibet. As soon as Tibet is completely connected and interfaced with existing surface links like the Karakoram Highway, the Chinese war fighting abilities will be incrementally multiplied, besides China obtaining strategic access to the Arabian Sea, and in turn to the Persian Gulf. From the massive infrastructure development in Tibet and the neighbouring regions, it is evident that China intends to now pursue its strategic interests on its western borders. Perhaps the days of "peaceful rise" doctrine, which commensurate with Sun Tzu's aphorism that counseled achieving victory without ever engaging in battle, are over. The growth of Chinese military power since the 1990s – precipitated initially by a desire to protect its interests in Taiwan but now driven by the necessity of fielding a competent military commensurate with its rising status – may increasingly put at risk elements of the security system that traditionally ensured stability in Asia.⁶² The remoteness of Tibet was one such natural security system. However, a cocktail of military, security and economic ambitions has ensured the transformation of once buffer state of Tibet into another Chinese province where infrastructure clearly exceeds the current demographic and security requirements. 

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Notes:

1. "China's Growing Pains," *The Economist*, August 19, 2004.
2. Norbu, Dawa, 'Chinese Strategic Thinking on Tibet and the Himalayan Region', *Strategic Analysis*, July 2008.
3. Mah, Feng-hwa, "The First Five-Year Plan and Its International Aspects", in C. F. Remer, editor, *Three Essays on International Economics of Communist China*, Ann Arbor: University of Michigan Press, 1959, p. 49.
4. Norbu, Dawa Op. cit.
5. Norbu, Dawa, "Strategic Development in Tibet: Implications for Its Neighbours", *Asian Survey*, Vol. 19, No. 3, University of California Press, March 1979, pp. 245-259.
6. Chansoria, Monika' "Implications of Infrastructure Development in Tibet", available at www.claws.in/index.php?action=master&task=612&u_id=36
7. Arya, Shailender, "The Train to Lhasa", *The Journal of Defence Studies*, Vol. 2, No. 2, Winter 2008.
8. Lhasa-Shigatse Railway Project Stalled in TAR's Leap Forward in Development, *The Tibetan Review*, January 12, 2010, available at <http://www.tibetanreview.net/news.php?id=5311>
9. Ibid.
10. Krishnan, Ananth, "China Plans Air and Rail Network to Boost Infrastructure", *The Hindu*, July 28' 2010.
11. Ibid.
12. Bakshi, GD, "The Chinese Threat in Perspective", *CLAWS Journal*, Summer 2010, p. 60.
13. "China Begins Extending Plateau Railway to Tibet's Second Largest City", *Xinhua*, September 26. 2010. See the subject news report available at http://news.xinhuanet.com/english2010/china/2010-09/26/c_13530486.htm
14. Bules, Mark, "Chinese Policy Towards Russia and the Central Asian Republics", RAND Corporation, New York. Available at www.rand.org/pubs/monograph_reports/2007/MR1045.pdf
15. McCauley, Martin, "Why Is China Engaged in a Military Build-Up in the Himalayas?" September 17, 2009. See the subject article available at <http://www.stirringtroubleinternationally.com/2009/09/17/why-is-china-engaged-in-a-military-build-up-in-the-himalayas/>
16. Parashar, Sachin, "Now, Chinese Rail Link Right up to Arunachal", *The Times of India*, October 14, 2010, available at <http://timesofindia.indiatimes.com/india/Now-Chinese-rail-link-right-up-to-Arunachal/articleshow/6743220.cms#ixzz12UEAEeEV>
17. Chansoria, Monika, "Trendlines in China's Infrastructure Development in Tibet", *CLAWS Journal*, Summer 2010, p. 185.
18. "Asia: New Silk Roads", *The Economist*, London, April 10, 2010. Vol. 395, Issue 8677, p. 48.
19. Ibid.
20. Krishnan, Ananth, "China Signs US \$ 525-million Deal to help Pakistan Highway Projects in PoK", *The Hindu*, July 10, 2010.
21. Bahl, Raghav, *Superpower? The Amazing Race between China's Hare and India's Tortoise*, New Delhi: Allen Lane, Penguin Books, 2010, p.163.
22. "Tibet Train Carries China Troops", *BBC News*, December 01, 2007, available at <http://news.bbc.co.uk/2/hi/asia-pacific/7122433.stm>

23. Views expressed by Srikanth Kondapalli at a seminar organised by the Institute of Peace and Conflict Studies, New Delhi, August 2, 2006. The seminar report can be seen at http://www.ipcs.org/seminar_details.php?recNo=749
24. Asthana, SB, *Infrastructure Development by China in Immediate Neighbourhood of India (Including Tibetan Autonomous Region): Military Implications for India*, Monograph No M-1/2008, New Delhi: United Service Institution of India, 2009, p.27.
25. "Highway construction progressing smoothly in Tibet", *Xinhua News Agency*, September 22, 2003.
26. "New Yunnan road to Improve Road Connectivity to Tibet", *The Tibetan Review*, January 2010, pp.9-10.
27. Jolly, Joanna, "Highway will bring Nepal and Tibet 'in from the cold'", *BBC News*, January 27, 2010, available at <http://news.bbc.co.uk/2/hi/8480637.stm>
28. Krishnan, Ananth, Op. cit.
29. Haider, Suhasini, Deputy Foreign Editor, CNN-IBN, "Only Our Fears Can Encircle Us", *The Hindu*, September 27, 2010.
30. "Comprehensive National Defense Transport System in Place", *Xinhua*, Hong Kong Service, August 5, 1995, cited in Foreign Broadcast Information Service (FBIS) - China, August 7, 1996.
31. Flanagan, Stephen J, and Marti, Michael E., *The People's Liberation Army and China in Transition*, Washington D.C.: Institute for National Strategic Studies, National Defense University Press, 2003, pp.119-121. The list of PLA units participating in laying OFCs along with the line constructed by them is also given in the report.
32. Asthana, SB, Op cit., p.36.
33. Railpage, Tibet, available at <http://www.railpage.com.au/f-p1340308.htm>
34. BBC Monitoring International Reports, "China to complete construction of Tibet's biggest logistics centre by June 2009", November 29, 2008.
35. *Xinhua News Agency report*, "Tibet Biggest Logistic Centre to be Completed in 2009", cited in People's Daily, December 10, 2008.
36. Asthana, SB, Op cit., p. 29.
37. Dasgupta, Saibal, "China's 'Peace' Airport 100 km from Mt Everest", *The Times of India*, April 13, 2010.
38. Meng, Yan, "Tibet's Xigaze Airport Begins Operations", *People's Daily Online*, November 01, 2010, See the news report available at <http://english.peopledaily.com.cn/90001/90776/90882/7184049.html>
39. "Lhasa-Shigatse Railway Project Stalled in TAR's Leap Forward in Development", *The Tibetan Review*, January 12, 2010, available at <http://www.tibetanreview.net/news.php?id=5311>
40. Jialu, Chen, "Tibet Airlines to Launch in May", April 16, 2010, *China Daily*, available at http://www.chinadaily.com.cn/business/2010-04/20/content_9752343.htm
41. McCauley, Martin, Op cit.
42. "China Blocks Road Project in India, Builds Border Airstrips in Tibet", *The Tibetan Review*, January 2010, p.22.
43. "Chinese Airfields: Overview", available at www.fas.org. Accessed on December 20, 2010.
44. Sakhuja, Vijay, 'Missile Developments in China, India and Pakistan: A Burgeoning Missile Race', Jamestown Foundation, China Brief Volume: 10 Issue: 10, 13 May 2010.
45. Claude Arpi, "Missiles in Tibet", *Indian Defence Review*, July-September 2008, pp. 38-43.

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46. Kristensen, Hans M. *et al.*, Report: Chinese Nuclear Forces and US Nuclear War Planning, November 30, 2006, available at <http://www.nukestrat.com/china/chinareport.htm>
47. "China Reorganizes Northern Nuclear Missile Launch Sites", available at http://www.fas.org/press/news/2007/2007jul_chinamissilesites.html
48. Sahkuja, Vijay, "Military Build Up Across the Himalayas: A Shaky Balance," The Jamestown Foundation, China Brief Volume IX, Issue 18, September 10, 2009.
49. Ibid.
50. Tibet 2000: The State of Environment", available at www.tibetoffice.org/en/index.php.
51. "Second Artillery Corps (SAC)", Nuclear Threat Initiative (NTI), Washington D.C., available at <http://www.nti.org/db/china/sac.htm>
52. "China deploys new CSS-5 missiles on border with India", PTI, August 17, 2010. available at <http://timesofindia.indiatimes.com/india/China-deploys-new-CSS-5-missiles-on-border-with-India/articleshow/6324105.cms#ixzz0ws8qvi2U>
53. Krishnan, Ananth, "Tibet Railway to Boost Logistical Support", *The Hindu*, August 6, 2010.
54. Karnad, Bharat, "Is the Indian Military Optimally Equipped", Talk delivered at Defence Services Staff College, Wellington on August 13, 2010.
55. "US-China Environment, Science & Technology Cooperation", US Embassy, Beijing, Environmental Conditions in Tibet, March 2002.
56. Zhiyuan, Cui, *et al.* "China: Human Development Report 1999", United Nations Development Programme, Oxford University Press, 2000.
57. "Development in Tibet an advantage for China: MoD", *The Indian Express*, March 30, 2010.
58. Seminar on "Implications of Infrastructure Development in Tibet" at the Centre for Land Warfare Studies (CLAWS), New Delhi on July 22, 2010. Speech by Chairperson Lt Gen KT Parnaik, Director General Perspective Planning, Integrated Headquarters of MoD (Army). See excerpts of speech available at http://www.claws.in/index.php?action=master&task=612&u_id=36
59. Ibid. Speech by Maj Gen Ravi Arora (Retd).
60. The Associated Press: 'China Holds First Live-fire Joint Drills in Tibet', available at www.ap.org, accessed on October 28, 2010. On Exercise Kuayue (Stride-2009), PLA Daily has a series of reports at tp.chinamil.com.cn/manoeuvre/kuayue2009.htm. Unit identifications can be derived from the information available at news.xinhuanet.com/mil/2009-08/10/content_11858323.htm.
61. Bakshi, GD, "The Chinese Threat in Perspective", *CLAWS Journal*, Summer 2010, pp. 61-63. An overview of the Chinese exercises can also be seen at Jamestown China Brief. See Blasko, Dennis J., "PLA Exercises March Toward Trans-Regional Joint Training", Jamestown Publication: China Brief Volume: 9, Issue: 22, November 4, 2009.
62. Tellis, Ashley J, "China's Grand Strategy", *CLAWS Journal*, Summer 2010, p.30. Paper originally published in Gary J. Schmitt, ed., *The Rise of China: Essays on the Future of Competition*, Encounter Books, 2009.