



VOLUME 20 • ISSUE 20 • NOVEMBER 13, 2020

IN THIS ISSUE:

China's Vaccine Diplomacy Revamps the Health Silk Road Amid COVID-19

By Elizabeth Chen.....pp. 1-7

“Helmsman” Xi Jinping Primed to Rule Until At Least 2030s

By Willy Wo-Lap Lam.....pp. 8-12

The Trans-Himalayan ‘Quad,’ Beijing’s Territorialism, and India

By Jagannath Panda.....pp. 13-18

The PLA’s Pursuit of Terahertz: Facts and Fallacies

By Marcus Clay.....pp. 19-28

Mongolia’s Economic Recovery from COVID-19 Dependent on China

By Antonio Graceffo.....pp. 29-34

China's Vaccine Diplomacy Revamps the Health Silk Road Amid COVID-19

By Elizabeth Chen

Introduction

As global COVID-19 cases exceed 51 million, a top health official from the People's Republic of China (PRC) has predicted that China is "very likely" to avoid a winter coronavirus outbreak, adding that the coronavirus situation in China was "very safe overall" ([Caixin](#), November 11). The head of China's Center for Disease Control and Prevention (CCDC) expressed a similar optimism in September when he noted that widespread vaccinations likely would not be necessary in China due to the country's effective control of the outbreak ([SCMP](#), September 13).

At the same time, Chinese researchers have raced to develop viable COVID-19 vaccine, sometimes skirting vaccine development norms in the process and already inoculating hundreds of thousands of people under "emergency use authorizations" ([Caixin](#), September 8).[1] While countries experiencing high coronavirus caseloads in the West have reportedly stockpiled pre-purchases of vaccines, Chinese Communist Party (CCP) General Secretary and PRC President Xi Jinping has repeatedly pledged to make a COVID-19 vaccine "a global public good", available to all ([Xinhua](#), May 18).



Image: A researcher tests samples of one of Sinopharm's inactivated vaccines in Beijing on April 11, 2020 (Image Source: [Xinhua](#)).

Chinese Vaccine Diplomacy

China made headlines in October when it signed on to COVAX, a UN-led program aiming to promote equitable access to COVID-19 vaccines for developing countries ([CGTN](#), October 9). But with large states

such as the U.S. and Russia failing to sign on to the initiative, COVAX has failed to raise even a tenth of the \$35 billion that is needed to successfully scale up vaccine distribution worldwide ([WHO](#), September 21). In separate deals, Chinese leaders have promised to provide \$1 billion in loans to help Latin American and Caribbean countries purchase vaccines ([China Daily](#), July 27), and to distribute free vaccines across Africa and Southeast Asia ([Xinhua](#), June 18; [Asia Times](#), August 26). For some countries, China promised to provide vaccines in return for aid in carrying out safety trials ([The News \(PK\)](#), August 14; [Yicai Global](#), October 16).[2] For others, promises of vaccine doses have been connected with pressures to agree to specific foreign policy objectives, echoing the strings often attached to China's heavy-handed "mask diplomacy" earlier in the pandemic.[3]

After stumbling in its initial response to the coronavirus outbreak in Wuhan, the Chinese government has boldly leveraged the chaos of the pandemic to pursue strategic gains at the expense of longstanding norms: challenging territorial designations along the Indian border and in the South China Sea as well as contesting Taiwanese sovereignty; and cracking down on domestic security issues in Hong Kong, Xinjiang, Tibet, and Inner Mongolia. At the same time, China has worked to rehabilitate its international reputation, which was dealt a bad blow by the coronavirus.

Diplomats charged with "telling China's story well" (讲好中国故事, *jianghao zhongguo gushi*) have hit back hard against allegations of Chinese wrongdoing during the pandemic, calling such criticisms a "political virus" (政治病毒, *zhengzhi bingdu*) that must be fought alongside the coronavirus ([PLA Daily](#), May 22). In June, the Chinese government published a white paper that sought to clarify the narrative of China's triumph against COVID-19 and present its (airbrushed) experiences as a model for emulation ([China Daily](#), June 8). In the context of this strategic propaganda push, China's vaccine diplomacy becomes another tool for promoting its position as a responsible global leader amid the ongoing health crisis.

Origins of the Health Silk Road

In 2015, China's National Health and Family Planning Commission released a three year plan to establish "health cooperation networks" with countries participating in China's grand foreign policy Belt and Road Initiative (BRI) ([China Daily](#), December 18, 2015). The Health Silk Road (HSR, 健康丝绸之路, *jiankang sichou zhilv*) was officially established as a joint initiative with the WHO at the beginning of 2017. Following a Belt and Road Forum for Health Cooperation headlined by the WHO Director-General later in the year, China published a "health silk road communiqué" signed by 30-odd countries, the WHO, and the Joint United Nations Program on HIV/AIDS ([Xinhua](#), August 18, 2017). Despite its strong initial rollout, the HSR largely fell out of the public eye over the next two years.

The role of traditional medicine was noticeably championed during the initial rollout of HSR; China has long pushed applications of traditional Chinese medicine (TCM) abroad as a means of bolstering its international soft power (and expanding a valuable domestic industry to new markets) ([China Daily](#), January 19, 2017; [Belt](#)

[and Road News](#), March 27). Interestingly, it has continued to do so during the COVID-19 pandemic even though there is little to no scientific evidence of TCM's efficacy in treating novel diseases (Xinhua: [March 19](#), [April 15](#), [October 26](#)).

It is worth taking a moment to note the difference between the HSR and other multilateral organizations for global health cooperation such as the WHO: China expert Nadege Rolland has described the HSR as “not a multilateral institution per se,” but rather a “hub-and-spoke organism...[with] China at the center [and] multiple bilateral arms extending outward” ([Axios](#), April 15). This distinction is important. While true multilateral organizations provide a relatively equalizing mechanism for inter-state diplomacy and dialogue, the balance of power in a hub-and-spoke model is weighted towards the center.

Revitalizing the HSR and BRI After COVID-19

The HSR has been connected with China's strategic foreign policy Belt and Road Initiative since its beginnings. And like the BRI, the HSR has proven difficult to define or quantify. This vagueness has lent a certain narrative flexibility, allowing propagandists to freely utilize the term while simultaneously avoiding the need to adhere to concrete measurements of success. Analysts have noted the BRI's reframing to address new economic goals amid a changing international situation in the wake of COVID-19 ([China Brief](#), September 28). The HSR has been similarly revamped to fit Chinese propagandists' evolving rhetorical needs in 2020.

The HSR was first referenced in connection with COVID-19 during a phone call between Chinese Foreign Minister Wang Yi and his Italian counterpart Luigi Di Maio on February 28 ([MFA \(China\)](#), February 28). Following this, Xi Jinping began alluding to the HSR in discussions of coronavirus-related aid with several heads of government in mid-March (Xinhua: [March 17](#), [March 21](#)). On March 24, a People's Daily commentary emphasized the renewed importance of HSR as a platform for BRI cooperation and as a means of contributing to global health governance ([People's Daily](#), March 24). Local media also explicitly tied China's distribution of coronavirus aid to its BRI linkages ([Sina](#), March 26).



Image: Boxes of medical supplies, including masks, gloves, and protective suits, donated to Italy by Lishui City, Zhejiang. Such images have served an important propaganda role for China. (Image Source: [Xinhua](#)).

As the pandemic began to spread around the world, China moved quickly to ship medical supplies to more than 120 countries ([Xinhua](#), April 4). In some instances, but not all, COVID-19 aid shipments were organized via preexisting transit pathways connected along the BRI. For example, shipments of medical supplies to Argentina were coordinated by existing BRI partners that had previously been involved in building hydroelectric dams in Argentina's Santa Cruz province, and China's close public health cooperation with states like Saudi Arabia and Italy were facilitated by the countries' memberships in the BRI ([Xinhua](#), May 21; [Belt and Road News](#), May 21; [CGTN](#), August 26).

The Health Silk Road has also been explicitly connected with the Digital Silk Road (DSR), another lesser-known BRI program aimed at enhancing digital connectivity which has also been revitalized this year ([Belt and Road News](#), May 20). Human rights watchers fear that as China touts its successful handling of the pandemic via the vehicle of the HSR, it may also seek to export related health surveillance technologies to other countries via the DSR.

Although a degree of public health surveillance is needed to mount an effective response to infectious diseases, China's wide-ranging collection of sensitive personal data as part of its response to the coronavirus did not include adequate protections for citizens' privacy. Additionally, cybersecurity experts have warned that the public health crisis contributed to an escalation of China's already oppressive authoritarian surveillance regime, and that new surveillance technologies (such as the Health QR Code) are not likely to go away anytime soon even though China has largely controlled the domestic spread of the coronavirus.[4] In short, China's surveillance regime underwent a massive expansion in response to the necessity of controlling COVID-19, and it seems likely that China will continue to leverage BRI linkages to export its repressive toolkit to authoritarian countries around the world as the pandemic continues.

Conclusion

Following China's promise to invest in a long-awaited Africa CDC earlier this year, some had hoped that the HSR's renewal earlier this year could drive China to learn from the lessons of past epidemics and work to overcome historic structural shortcomings in the developing world ([The China Story](#), September 17). But the evidence of China's bilateral vaccine diplomacy seems to indicate that China has adopted a dual strategy for cementing its position as a global health leader: simultaneously publicizing its involvement in multilateral initiatives to appear a responsible participant in the global system while also pursuing bilateral deals on the side that maximize its power and influence.

China was able to burnish its international reputation as a responsible global stakeholder by joining the COVAX initiative in October, but details of its subsequent participation in the multilateral group (such as the amount of financial support provided or contributions to COVAX's procurement "pool" vaccine supply) remain murky. Because COVAX has so far failed to achieve its funding goals, it is unlikely that it will be able to supply much of the globe's vaccine needs, and developing countries will still need to source at least a portion of their vaccine supplies elsewhere.

Crucially, China's bilateral deals to supply vaccines to developing countries in Africa, the Middle East, and Latin America have bypassed international standards on vaccine development, raising major ethical concerns. They could also present an opportunity for Chinese suppliers to negotiate higher prices than pooled purchases would have achieved. A report by Nikkei Asia has also noted that vaccine guarantees of immunity to COVID-19 may be short-lived; countries may have to source repeated inoculations to keep their populations safe, creating longer-term dependencies on vaccine suppliers ([Nikkei Asia](#), November 4).

Regardless of how it is done, supplying developing nations with a viable COVID-19 vaccine would mark a major triumph for China's biopharmaceuticals industry, which has been historically wracked by quality scandals and previously served primarily domestic consumers.^[5] China's vaccine diplomacy stands to benefit the country economically and politically, underscoring the development of a global health system in which Chinese influence dominates.

Elizabeth Chen is the editor of China Brief. For any comments, queries, or submissions, feel free to reach out to her at: cbeditor@jamestown.org.

Notes

[1] The state-owned company Sinopharm has provided unproven vaccine candidates to students going abroad ([Sixth Tone](#), October 27) and state employees deemed to be at high risk for exposure ([New York Times](#), July 16). Meanwhile, a controversial vaccine candidate created in cooperation between CanSino Biologics and the PLA-affiliated Academy of Military Science has been approved for "limited use" by military

personnel ([Global Times](#), June 29). See also: Dyani Lewis, “China’s coronavirus vaccine shows military’s growing role in medical research,” *Nature*, September 11, <https://www.nature.com/articles/d41586-020-02523-x>.

[2] Due to a lack of active coronavirus cases within the country, China’s vaccine researchers have had to go abroad to conduct Phase Three vaccine trials. As a result, Chinese biopharmaceutical companies have conducted vaccine trials in more than a dozen countries, including Peru, Argentina, Bahrain, United Arab Emirates, Egypt, Pakistan, Turkey, Morocco, Saudi Arabia, Bangladesh and Russia. See: Yojana Sharma, “China gambles with trust, transparency in race for vaccine,” *University World News*, October 10, 2020, <https://www.universityworldnews.com/post.php?story=20201010151810774>.

[3] For a discussion on the failures of mask diplomacy see: Gerry Shih, “China’s bid to repair its coronavirus-hit image is backfiring in the West,” *Washington Post*, April 14, 2020, https://www.washingtonpost.com/world/asia_pacific/chinas-bid-to-repair-its-coronavirus-hit-image-is-backfiring-in-the-west/2020/04/14/8611bbba-7978-11ea-a311-adb1344719a9_story.html. And for a summary of vaccine deal-related foreign policy gains, see: Sui-Lee Wee, “From Asia to Africa, China Promotes its Vaccines to Win Friends,” *New York Times*, September 11, 2020, <https://www.nytimes.com/2020/09/11/business/china-vaccine-diplomacy.html>.

[5] See: “China’s COVID-19 Surveillance Toolkit” in Dahlia Peterson, “Designing Alternatives to China’s Repressive Surveillance State,” *CSET*, October 2020, <https://cset.georgetown.edu/wp-content/uploads/CSET-Designing-Alternatives-to-Chinas-Surveillance-State.pdf>.

[6] For a discussion of some of the vaccine scandals which plagued China in 2016, 2018, and 2019, see (in chronological order): David O’Connor, “Vaccine Scandal Rocks China,” *ChinaFile*, May 4, 2016, <https://www.chinafile.com/green-space/vaccine-scandal-rocks-china>; Echo Huang, “China’s parents can’t even trust the country’s vaccines,” *Quartz*, July 23, 2018, <https://qz.com/1333758/vaccine-scandals-erupt-in-china-on-tainted-milk-scandal-anniversary/>; Joyce Huang, “Use of Expired Vaccine Sparks Public Scare in China,” *VOA*, January 16, 2019, <https://www.voanews.com/east-asia-pacific/use-expired-vaccine-sparks-public-scare-china>.

“Helmsman” Xi Jinping primed to rule at least until the early 2030s

By Willy Wo-Lap Lam

Introduction

The Fifth Plenary Session of the Chinese Communist Party’s (CCP) Central Committee, which took place from October 26 – 29, has elevated the status of President and CCP General Secretary Xi Jinping to that of Helmsman, a title once reserved only for the late Chairman Mao Zedong.[1] Strong signals were also sent that the Central Committee—comprised of 198 full and 166 alternate members—supported the 67-year-old supreme leader’s desire to continue exercising power for an additional ten years or more.

During the session, the Central Committee passed the main points of the 14th Five-Year Plan (FYP) (2021-2025) for National Economic and Social Development and the 2035 Long-Range Objectives (中共中央关于制定国民经济和社会发展第十四个五年规划和二〇三五年远景目标的建议, *ZhongGong Zhongyang Guanyu Zhiding Guomin Jingji He Shehui Fazhan Di Shisi Ge Wunian Guihua He ErLingSanWu Nian Yuanjing Mubiao De Jianyi*). These can be understood as a general and detailed outline of the 14th FYP. The actual plan, including specific, quantifiable targets for economic development, will likely be published sometime in March.



Image: Xi Jinping, Li Keqiang, Li Zhanshu, Wang Yang, Wang Huning, Zhao Leji and Han Zheng attend the fifth plenary session of the 19th Central Committee of the Communist Party of China in Beijing (Image source: Xinhua/Wang Ye).

A communiqué summarizing the four-day plenum, released on October 29, underscored the fact that the party and country’s policies and objectives would closely abide by “Xi Jinping Thought on Socialism with

Chinese characteristics for the New Era” (习近平新时代中国特色社会主义思想, *Xi Jinping Xin Shidai Zhongguo Tese Shehui Zhuyi Sixiang*). The communiqué noted that, “Experience has repeatedly indicated that with comrade Xi Jinping as the core of the “central party authorities” (中央, *Zhongyang*) and with the core of the party being the “navigator and helmsman” (领航掌舵, *linghang zhangduo*) ... we can definitely win over various difficulties and impediments on the road ahead” ([Xinhua](#), October 29; [Cpc.people.com.cn](#), October 29).

The goal of the new Five-Year Plan (FYP) is that “economic development will reach new [levels of] achievements and efficiency,” and encompasses pillars which include improving the people’s welfare, protecting the environment and promoting the digitalization of industry and everyday life. “The economy will continue to develop healthily under the premise of the clear raising of [the] quality [of growth],” the communiqué said. Despite the economic impact of COVID-19, the communiqué maintained that China remains on track to double its 2010 per capita income figures and become a “moderately prosperous society”(小康社会, *xiaokang shehui*) by 2021, the 100-year anniversary of the founding of the CCP ([Xinhua](#), October 17, 2017). The communiqué also laid out the goal to “basically realize socialist modernization” by 2035. Details on how such “socialist modernization” will be attained are scant, but the timing is interesting—2035 falls midway between the “Two Centenaries,” goalposts for China’s rise and development first set by Xi in 2012. By 2049, the 100-year anniversary of the country’s founding, China is set to become “a great modern socialist country that is prosperous, strong, democratic, culturally advanced, harmonious, and beautiful.”

In a post-plenum press conference, Han Wenxiu (韩文秀), Deputy Director of the General Office of the Central Commission on Finance and Economics 中央财经委员会办公室副主任 (*Zhongyang caijing Weiyuanhui Bangongshi Fu Zhuren*) — the nation’s highest decision-making body on the economy — disclosed that the FYP and the long-term objectives were drafted “under the direct leadership of General Secretary Xi Jinping.” Han added that Xi had personally consulted at the grassroots level in different provinces to gain an understanding of China’s economic situation, and that he had made ample modifications to the documents to enhance their quality ([Xinhua](#), October 30). Given that President Xi has emphasized the “top-level design” of economic and social policies since coming to power in 2012, it is expected that, health permitting, the new Helmsman will remain the party’s core at least until the CCP’s 22nd Party Congress in 2032 ([New York Times Chinese Edition](#), March 20, 2018; [Apple Daily](#), October 28, 2017).



Image: General Secretary of the Chinese Communist Party and President Xi Jinping learns about progress in consolidating poverty eradication at a villager's home in the village of Shazhou, Rucheng County, Hunan, on September 16. Image source: [Xinhua](#).

Known for his overarching ambitions and aspirations, Xi nonetheless seemed reluctant to divulge details regarding either the 14th FYP or the blueprint for the year 2035. The expected annual GDP increase in the 2021 to 2025 period, for example, was missing. The communiqué has, however, doubled down on goals already cited by official media in the past year. Without mentioning China's difficult relations with the U.S. and its allies, the possible decoupling of the Chinese and American economies or Washington's boycott of a number of key Chinese high-tech companies, the communiqué merely stated that, "the international situation has become more complicated by the day and that its unstable and uncertain nature has obviously increased."

It is under these circumstances that Xi has, in the past few months, raised the concept of the "dual domestic-international circulations but with domestic circulation as the main [consideration]," commonly shortened as the "dual circulation" system. This refers to the fact that while the open-door policy underscoring China's economic opening up remains valid, and that Beijing will make the two circulations complement each other, the leadership has shifted its attention towards prioritizing the domestic market to stimulate future economic growth. "Domestic circulation" refers to the reliance on China's nearly 1.4 billion people market for consumption and includes an emphasis on driving innovation in high technology related fields ([Xinhua](#), August 31; [BBC Chinese Edition](#), August 10).

Perhaps implicitly responding to how a number of Western countries have refused to sell core technologies to companies such as Huawei and ZTE, the communiqué highlighted Mao Zedong-style self-reliance: "We must insist on innovation as the core of our country's modernization," the document said. "Technological self-sustainability is the strategic pillar of national development." In addition to the general 14th FYP, the

central government also issued a specific FYP for technology at the beginning of this year ([Global Times](#), January 20). High-end areas such as AI, computer chips, robotics, genomics, green technology and space-related know-how are expected to be particular priorities for state-backed development. “China has a deep understanding of its shortfalls in technology, economics and the standard of living that could be targeted by the U.S.,” said Xie Maosong, a politics specialist at the University of Chinese Academy of Sciences. “It is only when the shortfalls are met that China can be impeccable” ([South China Morning Post](#), October 30).

Reflecting Xi’s belief in the synergy between high-tech development and defense, the communiqué also included a full paragraph on military modernization. “We must speed up the modernization of national defense and the armed forces so as to realize the synthesis of a rich country and a strong army,” the document said. The Central Committee laid special emphasis on the “simultaneous elevation of the capability of defense and the economy.” It also urged “the unity of the army and the government and the unity of the army and the people.” Under the Chinese system, whoever controls the army and the police is the de facto supreme leader, and Xi is known to devote a good chunk of his time to ensuring officers’ loyalty to himself ([abc.net.au](#), October 26, 2017; [Radio French International](#), October 14, 2017).

It is a mark of Xi’s perception of insecurity – in regards to both China’s national security and the stability of Chinese society in view of the economic downturn – that the Central Committee comprehensively addressed the issue of safety at all levels. “We must uphold a security view of the whole country, implement national security strategies, comprehensively handle conventional and unconventional security, and let the development of security run through various arenas of national development,” the document said. Ultimately, of course, Xi’s own security – his ability to remain both the party and the nation’s “core for life” – depends on whether he can withstand pressure and challenges from both abroad and within China.

Given that the plenum was held behind closed doors in a heavily guarded military hotel, it is difficult to find out whether any Central Committee member expressed views different from those of Helmsman Xi. This unfortunate reality was heralded in late September, when the authorities passed a set of “Work Regulations of the Central Committee.” The regulations pertain to six areas: the leadership status of the Central Committee, leadership systems, the frame of reference and powers of the leadership, leadership methods, decision-making procedures and “self-construction” (自身建设, zishen jianshe). Without going into substantive detail, the document laid emphasis on “resolutely upholding the authority of the zhongyang and its concentrated and unified leadership with comrade Xi Jinping as core” ([People’s Daily](#), October 13; [Apple Daily](#), October 1).

Xi’s overweening thirst for power has not only rendered checks and balances impossible, but has also dealt a telling blow to one of the most fundamental institutions put together by the Great Architect of Reform Deng Xiaoping: that top leaders must observe fixed tenures and pay attention to grooming their successors ([People’s Daily](#), August 12, 2014). Given that all seven members of the Politburo Standing Committee are

from the Fifth Generation (cadres born in the 1950s), Xi should have identified at least a few potential successors before now, according to party tradition. While there are several ordinary Politburo members who were born in the 1960s, none seems to have been given the portfolio and exposure needed to be groomed as a forthcoming top leader. The Fifth Plenum has traditionally been a venue for identifying future top cadres ([HK01](#), October 30; [Radio French International](#), October 29). For example, Xi was made a Vice-Chairman of the Central Military Commission – usually a stepping stone for the No. 1 spot – at the Fifth Plenum of the 17th Central Committee. If, however, it is true that the Helmsman plans to rule at least until the early 2030s, then there is no hurry for him to pick a successor. Political and institutional reforms, after all, were hardly an important concern for the Fifth Plenum.

*Dr. Willy Wo-Lap Lam is a Senior Fellow at The Jamestown Foundation and a regular contributor to China Brief. He is an Adjunct Professor at the Center for China Studies, the History Department, and the Master's Program in Global Political Economy at the Chinese University of Hong Kong. He is the author of five books on China, including *Chinese Politics in the Era of Xi Jinping* (2015). His latest book, *The Fight for China's Future*, was released by Routledge Publishing in July 2019.*

Notes

[1] Mao's title can be translated as "Great Helmsman" (伟大的舵手, weida de duoshou). In comparison, Xi's new title might more literally be translated as "core navigator and helmsman" (核心领航掌舵, hexin linghang zhangduo).

The Trans-Himalayan ‘Quad,’ Beijing’s Territorialism, and India

By Jagannath Panda

Introduction

Connectivity linkages between the People’s Republic of China (PRC) and trans-Himalayan countries have taken on a new hue with the recent Himalayan ‘Quadrilateral’ meeting between China, Pakistan, Afghanistan and Nepal ([MOFA \(PRC\)](#), July 27). Often referred to as a “handshake across the Himalayas,” China’s outreach in the region has been characterized by ‘comprehensive’ security agreements, infrastructure-oriented aid, enhanced focus on trade, public-private partnerships, and more recently, increased economic and security cooperation during the COVID-19 pandemic.[1] The geopolitics underlying China’s regional development initiatives, often connected with its crown jewel foreign policy project Belt and Road Initiative (BRI), have been highly concerning—not just for the countries involved, but also for neighboring middle powers like India, which have significant stakes in the region.[2]



Image: Video conference of foreign ministers from the so-called “Himalayan Quad” on July 27, 2020 (Image Source: [Chinese Ministry of Foreign Affairs](#)).

At the Himalayan Quad meeting, foreign ministers from all four countries deliberated on the need to enhance the BRI in the region through a “Health Silk Road”. Chinese Communist Party (CCP) General Secretary and PRC President Xi Jinping’s ‘Community of a Shared Future for Humanity’ was cited as justification for facilitating a “common future with closely entwined interests,” and the ministers agreed to work towards enhancing connectivity initiatives to ensuring a steady flow of trade and transport corridors in the region and

building multilateralism in the World Health Organization (WHO) to promote a “global community of health” ([Xinhua](#), July 28).

Connectivity linkages between China and the trans-Himalayan region have been significant for China’s foreign policy, economic and security strategies. For China, the region’s utility extends beyond its officially envisaged “win-win” cooperation ([MOFA \(PRC\)](#), April 10, 2018); China’s proactive desire to engage the trans-Himalayan region has much to do with its goals to exert economic leverage, consolidate normative power and extend its political and strategic influence regionally, lending stronger support for its notions of global governance.[3] In this context, trans-Himalayan connectivity initiatives under the banner of the BRI serve an important role in the creation of a Sino-centric regional order. Consequently, the prevalent geopolitics of the region, including India’s policies, are a crucial consideration in the progression of China’s grand infrastructural ambitions ([SIIS](#), May 5, 2017).

Beijing’s economic corridors undermine the historic trans-Himalayan balance of power

Recent years have shown that China is determined to ramp up political, economic, quasi-military and people-to-people exchanges in the region as part of its trans-Himalayan outlook. New Chinese-funded economic corridors such as the Chinese-Pakistan Economic Corridor (CPEC) and the Trans-Himalayan Connectivity Network (THCM) will not just impact trade, but also have crucial effects on the strategic, social and political landscapes of the host countries that they pass through. The geopolitical implications of China’s increasing regional activities are enormous.[4] Indeed, it could be argued that China’s regional policy has been developed through repeated “invisible incursions” using “religion, ideas, language and culture” to undermine past regional partnerships and reinforce China’s growing cultural and social power in the region ([Hudson Institute](#), October 31, 2017).

China’s economic influence is already strongly felt in Bangladesh and Nepal, which have traditionally fallen under India’s sphere of influence ([China Daily](#), July 5, 2019; [CGTN](#), November 27, 2017). As Beijing seeks closer ties to the smaller South Asian countries, it threatens India’s historic dominance in the region. The situation is expected to worsen if India-China relations continue to decline and hostilities between the two countries continue along the border. The CPEC—which passes through the contested Himalayan border region of Gilgit-Baltistan—is being built mainly by China with the support of both Pakistan and Afghanistan, further undermining India’s influence and raising tensions in the region ([Global Times](#), December 26, 2017; [Global Times](#), August 23).

Closer Sino-Afghan and Sino-Nepali ties fueled by infrastructure diplomacy

China has been interested in adding Afghanistan to its grand infrastructure initiative as early as 2014, and since 2017 it has held a series of trilateral talks with Afghanistan and Pakistan aimed at expanding the CPEC and BRI-related investments in Afghanistan ([Dawn](#), September 8, 2019; [MOFA \(PRC\)](#), July 7). China and

Afghanistan have signed agreements to connect the two countries in northern Afghanistan via the Sino-Afghanistan Special Railway Transportation Project and Five Nations Railway Project in 2016, and have also set in motion initiatives connecting CPEC to southern Afghanistan which went into effect earlier this year ([Freidrich Ebert Stiftung](#), August 2018; [Xinhua](#), July 14). China has also invested in the Afghanistan Ministry of Communications and Information Technology (MCIT)'s Wakhan Corridor Fiber Optic Survey Project; the first phase of this plan to create cross-border fiber linkages connecting Afghanistan and China was launched earlier this year ([Tolo News](#), April 23, 2017; [Business Wire](#), May 15).

China's renewed thrust on trans-Himalayan connectivity extends to Nepal as well. For example, China and Nepal held talks on expediting the Trans-Himalayan Multi-dimensional Connectivity Network (THMCN), a railway line which will link Kathmandu with Gyirong, a town in the south of China's Tibetan Autonomous Region (TAR), during President Xi's visit to Nepal last October ([Global Times](#), October 12, 2019). The THMCN will pave the way for more profound integration between China and the rest of South Asia, solidify border controls and aid in the economic development and integration of China's TAR. The infrastructure initiative will pass near Lumbini, which is close to the Indian border, and has raised concerns from Indian strategists ([VOA](#), October 16, 2019).



Image: A Lanzhou-Kathmandu freight train takes its inaugural trip in 2018. China and Nepal inked plans to build a cross-border railway a year earlier Image source: [Xinhua](#)).

Since formally becoming a member of the BRI in 2017, Nepal has signed multiple comprehensive agreements facilitating transboundary connectivity with China ([MOFA \(China\)](#), October 13, 2019; [IDSA](#), November 4, 2019). Further integration is being pushed, and the high-level importance given to Sino-Nepalese ties was demonstrated by an essay that Xi Jinping published in three major Nepali newspapers last year. Xi's article underscored the necessity for China and Nepal to 'deepen strategic communication', 'broaden practical cooperation', 'expand people-to-people exchanges' and 'enhance security

cooperation' ([Xinhua](#), October 11, 2019). Landlocked Nepal has traditionally relied on India for trade and transit routes. Now, China's infrastructure diplomacy has promised growth and development, while also providing Nepal with alternative trading routes that ameliorate its reliance on India ([Aljazeera](#), July 29). For China, not only is Nepal's location geo-economically significant, but its large population of Tibetan residents also plays a crucial role in its importance for China ([The Wire \(India\)](#), October 4, 2019). For the sake of its internal security, China cannot afford to let countries such as the U.S. or India pull Nepal away, and is constantly wary of other nations "waving the Tibet card" ([China Brief](#), September 28).

It is important when evaluating the BRI's infrastructure projects in South Asia to contextualize it among China's broader foreign policy narratives. President Xi has repeatedly expressed interest in advancing China's "peripheral diplomacy" (外围外交, *waiwei wajijiao*) and "good neighbor diplomacy" (睦邻外交, *mulin wajijiao*) ([Embassy of the PRC in Grenada](#), March 19, 2019; [People's Daily](#), January 5, 2015), complementing trans-Himalayan connectivity policies like CPEC and THMCN. China's charm offensive—coupled with its massive economic weight—appears to be working. In contrast, India has struggled to manage its 'Neighborhood Policy', and has been particularly unsuccessful in demarcating its boundaries with China ([MEA \(India\)](#), July 14, 2017). India-driven connectivity developments have so far been limited due to unsettled boundary issues with Pakistan and Nepal in Kalapani and Susta, respectively.

Pakistan and China's growing isolationism

The COVID-19 pandemic has given rise to anti-China rhetoric worldwide. With countries like Japan actively moving manufacturing out of Beijing and China-Australia ties reaching an "all time low", China is finding its international goodwill rapidly depleted ([Nikkei Asia Review](#), April 16; [Global Times](#), June 25; [Pew Research](#), October 6). Ongoing technology and trade tensions with the U.S.; continued human rights abuses in Hong Kong, Tibet, and Xinjiang; renewed tensions in the Taiwan Strait and the South China Sea; and negative military and diplomatic posturing with India post-Galwan have further hurt China's reputation in 2020.

Against this backdrop, China's push for CPEC must be analyzed in the context of China-Pakistan relations. Beijing has declared its desire to exhibit a "new model of state-to-state relations" between the two countries ([Embassy of the PRC in Pakistan](#), April 10, 2018). Relations between China and Pakistan have always been relatively warm, with Pakistan often siding with China on a variety of matters against India. The India-China-Pakistan trilateral relationship has been marred by a convoluted history of unresolved border disputes and recurrent military confrontations at the India-China Line of Actual Control (LAC) and at the India-Pakistan Line of Control (LOC). Beijing responded poorly to India's abrogation of Article 370 in Jammu and Kashmir, which defined Ladakh as a separate Union Territory last year, and this year, China has renewed its diplomatic and military aggressions in the border region ([MOFA \(PRC\)](#), August 6, 2019; [China Brief](#), July 15). Amid worsening Sino-Indian tensions, the CPEC has been a platform for China to exert influence in the trans-Himalayan region. India's policy changes last year only served to impede—but not

halt—China’s growing regional power. When fully realized, the CPEC will cement China-Pakistan economic relations, further unbalancing the complicated security dynamics of the India-China-Pakistan triangle.

Conclusion

Even though China has tried to couch its ‘Himalayan Quad’ initiative in the framework of infrastructure diplomacy and development, it is impossible not to view the initiative through a security prism. In the wake of the COVID-19 pandemic, China has proposed a four-point action plan for its three Himalayan South Asian friends, offering support through economic, medical and infrastructural aid ([Global Times](#), July 28). The degree to which such aid could diplomatically compromise these countries is yet to be seen, but early missteps in China’s so-called mask diplomacy elsewhere have bluntly demonstrated the strings that are so often attached to its foreign policy initiatives ([SCMP](#), March 28).

China’s investments in trans-Himalayan connectivity have a clear geostrategic and security rationale. It is worth noting that many of the large-scale road projects in the Himalayas seem to be catered towards troop movement in addition to facilitating local transportation. Even the hydropower constructions that the BRI has funded, which are an integral part of the trans-Himalayan power corridors, can be seen as a trademark tool of China’s territorialism and ‘state-making’ ([Asia Times](#), October 4, 2019).[5]

China is seeking to combine economic cooperation with geopolitical gains in the trans-Himalayan region through multiple new assemblages and pathways. The fluid and open-ended nature of the BRI projects have been easily repackaged in China’s post-pandemic diplomacy. In such a scenario, it is imperative for India to abandon its languid foreign policy approach, exercise more pre-emptive authority and delineate its agenda well, not only to secure its border territories but also exude more confidence as a strong middle power in the Indo-Pacific.

[Dr. Jagannath Panda](#) is a Research Fellow and Centre Coordinator for East Asia at the Institute for Defence Studies and Analyses, New Delhi. He is the Series Editor for “[Routledge Studies on Think Asia](#)”. Dr. Panda is the Co-Editor/Author of the forthcoming book “[Chinese Politics and Foreign Policy under Xi Jinping: The Future Political Trajectory](#)” (Routledge, 2020). He is also the author of “[India-China Relations: Politics of Resources, Identity and Authority in a Multipolar World](#)” (Routledge, 2017), and “[China’s Path to Power: Party, Military and the Politics of State Transition](#)” (Pentagon Press, 2010).

Notes

[1] See: Murton, G., Lord, A., & Beazley, R., “A handshake across the Himalayas: Chinese investment, hydropower development, and state formation in Nepal,” *Eurasian Geography and Economics*, September 2016, 57: 3, 403–432; Sarkar, Sudeshna, “Handshake Across Himalayas”, *Beijing Review*, Oct. 21, 2019, http://www.bjreview.com/World/201910/t20191021_800182136.html.

[2] Oliveira, Gustavo., Murton, Galen., Rippa, Alessandro., Harlan, Tyler & Yang, Yang, "China's Belt and Road Initiative: Views from the ground," *Political Geography*, May 12, 2020; Voon, P. Jan & Xu, Xinpeng, "Impact of the Belt and Road Initiative on China's soft power: preliminary evidence", *Asia-Pacific Journal of Accounting & Economics*, November 3, 2019, 27:1, 120-131.

[3] Callahan, A. William, "China's 'Asia Dream': The Belt and Road Initiative and the new regional order," *Asian Journal of Comparative Politics*, May 16, 2016, 1:3, 1-18.

[4] Murton, Galen & Lord, Austin, "Trans-Himalayan Power Corridors: Infrastructural Politics and China's Belt and Road Initiative in Nepal," *Political Geography*, March 2020, 77: 102100.

[5] Gamble, Ruth, "How dams climb mountains: China and India's statemaking hydropower contest in the Eastern-Himalaya watershed," February 15, 2019, accessed from: <https://journals.sagepub.com/doi/full/10.1177/0725513619826204>.

The PLA's Pursuit of Terahertz: Facts and Fallacies

By Marcus Clay

Introduction

Successful military operations depend upon freedom of action in the warfighting domains of air, space, ground, sea, and cyberspace. Today, effective command and control and situational awareness depend upon radio communications and sensors. Domination of the electromagnetic spectrum (EMS) enables joint force commanders to gain tactical, operational, and strategic advantage over a potential adversary.[1] EMS is broken down into frequency bands defined by certain physical characteristics, which include radio waves, microwaves, millimeter waves, infrared, visible light, ultraviolet radiation, x-rays, and gamma rays.

Over the past decade, defense establishments around the world have been assessing the feasibility of sensors, radar, and communications operating in the terahertz (THz) portion of the frequency spectrum. The U.S. Department of Defense's efforts are particularly focused on technological breakthroughs in the microelectronics that would drive THz emitters ([DARPA](#), undated).



Image: The CAEP THz Research Center was created in 2012 (Image Source: [MMwave](#)).

The PLA has long believed that modern warfare hinges upon “the fifth domain of the EMS space (第五维电磁空间, *di wu wei dianci kongjian*),” and that THz is “unquestionably” a key technology to dominate the EMS and gain an edge in military competition. ([PLA Daily](#), April 10). [2] EMS domination is seen as the key to “muting the adversary’s communications, blinding its radars, and paralyzing its networks” to win modern wars. ([Civilian Staff WeChat](#), April 11). Military and civilian resources, both in terms of funding and human capital, have been invested in China’s pursuit of THz technologies as early as the 2005 Xiangshan Science Conference (香山科学会议, *Xiangshan Kexue Huiyi*), although the exact quality of China’s THz research and development (R&D) remains unclear ([XSSC](#), November 21; [THz Applications WeChat](#), January 29). The

majority of “outputs” of such R&D programs show promise, albeit with seemingly limited military value. Nevertheless, over the past fifteen years or so, China has created a state-led innovation ecosystem to sustain both basic and applied research of THz.

This article first provides a brief introduction to militarily relevant THz technologies and Chinese perspectives on THz. It then identifies key personnel and organizations that China has created to sustain its THz R&D, and finally describes progress made in military applications of THz technology, including communications, radars, and other fields. China-watchers are advised to monitor the advances that the PLA is making in this emerging area of competition in the years to come.

What is THz and How Does the PLA Think About It

THz is a portion of the EMS between the microwave and infrared bands, roughly between 0.1–10 THz, corresponding to wavelengths from 3mm down to 30 μ m. Thanks to its advantages of good penetrability and low photon energy, THz sensors could feasibly support intelligence, surveillance and reconnaissance (ISR) by detecting personnel behind enemy lines, identifying targets, and supporting terminally guided precision weapons.[3] PLA scholars acknowledge that THz technologies have extensive military applications, and have discussed THz’s possibilities in the following fields: detect and distinguish explosive; assist long-range detection and imaging detection; facilitate battlefield and satellite communications; enhance terminal precision-guided missiles; and facilitate counterterrorism security inspection ([PLA Daily](#), December 22; [PLA Daily](#), May 24). However, THz has been relatively underexplored compared to the rest of the EMS due to technical challenges associated with generating, detecting, and processing signals at these wavelengths.[4]

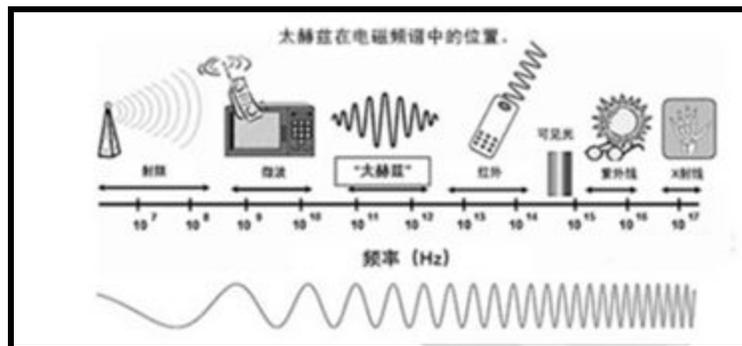


Image: THz spectrum on EMS (Image Source: [PLA Daily](#))

While acknowledging “gaps” in THz research, Dr. Zeng Yang (曾旻), from the College of Meteorology and Oceanography of the National Defense University of Technology (NUDT/国防科技大学), identified three key military applications: high-speed encrypted communications, high-resolution target detection, and battlefield situational awareness and imaging where THz applications could be useful ([PLA Daily](#), April 10).

This echoes an earlier discussion in which PLA analysts explicitly noted that THz technology will play a significant role in “military communications, battlefield reconnaissance, precision guidance, counter-stealth, and electronic countermeasures (ECM)” ([PLA Daily](#), March 31).

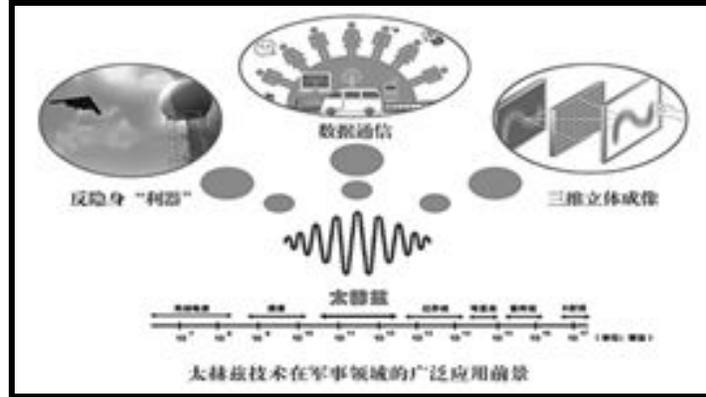


Image: Possible Military Applications of THz technologies (Image Source: [PLA Daily](#))

Below is a table containing a selected list of key institutions supporting THz research and development in China.

Selected Key Institutions in China’s THz R&D

R&D Base, Center, Coordinating Bodies
Strategic Research Base for Frontier THz S&T Development (太赫兹科学技术前沿发展战略研究基地) Est.2013; provides THz science development policy and planning] under the auspices of CIE, NSFC, CAS
China Institute of Electronics (CIE) THz Chapter (中国电子学会太赫兹分会)
CAEP Microsystems and Terahertz Research Center (中物院微系统与太赫兹研究中心)

Cooperative Innovation Center of THz Science

([太赫兹科学协同创新中心](#))

University of Electronic Science and Technology of China (UESTC) [THz generation and manipulation mechanism] as the core;

Nanjing University [THz testing mechanism]

Tsinghua University [THz high-speed wireless communications and high-quality THz source]

CAS Institute of Electronics (中科院电子学研究所)[5]

CAS Institute of Opto-Electronics (中科院光电技术研究所)

[micro-nano fabrication technology]

Key Labs & Research Institutes

CAS Key Lab of Electromagnetic Radiation and Sensing Technology

(中国科学院电磁辐射与探测技术重点实验室)

CAS Key Lab of High-Power Microwave Power Sources and Technologies

(KLHPM/中国科学院高功率微波源与技术重点实验室)

CETC 13th Research Institute National Key Lab for Application Specific Integrated Circuits

(中电第13研究所专用集成电路国家级重点实验室)

CETC 12th RI National Key Lab of Microwave Electronic Vacuum Devices

(中电第12研究所微波电真空器件国家重点实验室)

CAEP Chengdu Base -THz FEL Lab

([中物院成都基地太赫兹自由电子激光实验室](#))

<p>NORINCO 205th Research Institute served as a “third party” verifier during the free electronic laser test (Xinhua, September 25)</p>
<p>CAS Key Lab of Terahertz Solid-State Technology (中国科学院太赫兹固态技术重点实验室) CAS Shanghai Institute of Microsystem and Information Technology (中国科学院上海微系统与信息技术研究所)</p>
<p>UESTC's National Key Lab for Communications Counter-Countermeasures Technology (通信抗干扰技术国家级实验室)</p>
<p>CETC 41st Research Institute Qingdao Yi'ai Electronic Communications/CETC subsidiary China Electronics Technology Instruments Company (中电第41所青岛依爱电子产业园/中电科仪器仪表有限公司) [6]</p>
<p>CETC 22nd Research Institute (China Radio wave Propagation Institute), Qingdao campus (中电科22所青岛分所)</p>
<p>Academic Institutions</p>
<p>Shanghai Institute of Technology (上海理工大学)</p>
<p>Shandong S&T University (山东科技大学) THz Technology Research Institute [Est. 2003, Liu Shenggang as Director]</p>

Capital Normal University Physics Department

(首都师范大学)

THz Military Applications and the PLA

Communications

Applied THz technology is often discussed in the context of building a future 6G or even 7G communication network. ([Phys.org](#), September 8; [Fiercewireless](#), July 14; [S&T Daily](#), May 7) While such discussions remain largely futuristic, Miao Wei (苗圩), former head of the Ministry of Industry and Information Technology (MIIT), said in 2018 that China “has already started looking into 6G development”. Li Shaoqian (李少谦), director of UESTC’s National Key Lab for Communications Counter-Countermeasure Technology (通信抗干扰技术国家级实验室, *Tongxin Kang Ganrao Jishu Guojia ji Shiyanshi*), has said that “THz communications should be the technology that 6G network is built on,” ([Xinhua](#), March 26).[7] Indeed, Li’s lab was involved in at least one 863 Program project on integrated millimeter wave and THz technology and high-speed baseband signal processing technology research (毫米波和太赫兹总体技术与高速基带信号处理技术研究, *Haomibo he Taihezi Zongti Jishu yu Gaosu Jidai Xinhao Chuli Jishu Yanjiu*) ([UESTC](#), undated).

Li’s comments echo PLA analysts’ writings about the advantages of THz communications, which include possibilities for high-capacity and highly secure battlefield communications. THz communications can sustain “data transmission that is a hundred times faster than 5G with a latency of microseconds.” ([PLA Daily](#), April 10). Another important consideration is that the decreased angular divergence (that is, the increased directionality) of transmitted signals, owing to the reduced effects of diffraction on THz waves with shorter wavelengths, present a more challenging environment for eavesdroppers compared to the wide-area broadcasts used at lower frequencies.[8]

Although authoritative information is scarce, circumstantial references suggest that Chinese defense scholars have also examined THz technology applications in space. For instance, in 2017, a dedicated subsection on “Telemetry and Control (遥测遥控, *Yaoce Yaokong*)” of the Third Aerospace Electronic Strategy Forum (航天电子战略研究论坛, *Hangtian Dianzi Zhanlve Luntan*) organized by the CASC Ninth Academy’s S&T Committee included papers that discussed the use of THz technology in space-based ISR systems, as well as the design of wireless data communications in space.[9] Li Shaoqian’s lab likely also has been involved in exploring the use of THz technologies in space situational awareness, and inter-satellite communications ([Renmin Net](#), October 10). On November 6, UESTC announced on its official website that a 70kg- satellite that bears the university’s name, “UESTC,” also known as Tianyan-05 (天雁05卫星), was successfully launched from China’s Taiyuan Satellite Launch Center (TSLC) in Kelan, Shanxi, to carry out multiple in-orbit

testing including using THz communications equipment developed by UESTC ([UESTC](#) website, November 6; [Sichuan Daily](#), November 7).

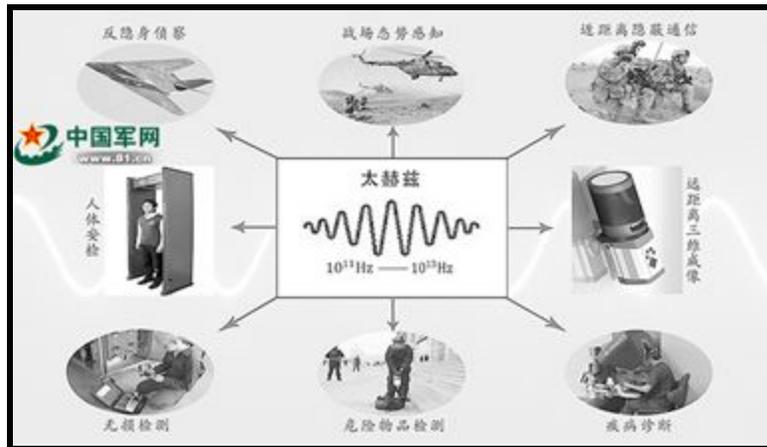


Image: Applications of THz – most notably, the top three illustrations show military applications including, left to right, anti-stealth recon; battlefield SA; short-distance concealed communications. (Image Source: [PLA Daily](#))

Radar

Theoretically, THz radar can emit tens of thousands of specific frequencies in picosecond and nanosecond pulses at the gigawatt (GW) level. In other words, photons generated by THz radar would have exceptionally short wavelengths of between 0.3 to 3 THz, which can penetrate non-metallic materials, in a similar fashion to x-rays ([PLA Daily](#), April 10). THz radar can also improve multi-target discrimination and recognition by detecting several target sources. While it is generally believed that atmospheric attenuation in the THz band reduces the militarily effective range of the radar, there are nonetheless signals that China is researching the possible applications of THz radar.[10]

In 2011, CAEP's Terahertz Research Center developed a 140 GHz Inverse SAR (ISAR) capable of real time imaging, and also carried out an imaging test combining THz radar and an unmanned aircraft ([IEEE](#), September 2013). NORINCO's 209th Research Institute successfully used a 0.89 THz laser device to detect a "stealth" target in 2012.[11] The same year, China Aerospace Science and Industry Corporation (CASIC) Second Academy's 23rd Research Institute—previously involved in developing air defense-related radar and communication systems—reportedly developed China's first THz synthetic aperture radar (SAR). A flight test was reportedly carried out and the first set of THz video was recorded via SAR. The institute was reported to make improvements in accordance with specific application needs in the future ([Xinhua](#), December 18). Details about the flight test, such as the aircraft altitude, distance to target, picture resolution and size of the target, were not made public.

There is also evidence that Chinese military scholars have looked into the application of THz radar in spacecraft's early warning and target detection for ballistic missiles, and that they believe it may have a critical role to play in offensive and defensive space systems.[12]

Security Detection

THz electromagnetic waves may be particularly useful for locating, detecting, and characterizing concealed threats, by spectroscopically detecting and identifying concealed materials through their characteristic transmission or reflectivity spectra in the range of 0.5–10 THz. China has made progress in THz's applications for security detection as well. In February 2020, "all-in-one contactless integrated security check systems" were installed at several metro stations and long-distance bus stations in Shanghai. ([Keji Ribao](#), February 14; [Xinhua](#), February 14) The system was developed by Brainware Terahertz Information Technology Co. (博微太赫兹公司, *Bowei Taihezi Gongsi*), a subsidiary of CETC's 38th Research Institute ([Xinhua](#), March 20).[13]

Conclusion

China and the PLA seek to control the THz portion of the frequency spectrum to gain a military edge. The Chinese civilian and defense academic community appears to be investing significant resources into both basic research of THz technologies and assessing the feasibility of THz technology for military communications, radars, and security detections. Numerous well-coordinated programs have been carried out simultaneously, and the scope of China's state-sponsored investment in the development of THz technology is impressive. This is intricately linked to China's perception that dominating the THz spectrum has a potentially decisive role to play in future conflicts. Although key transformational military applications of THz technologies will likely take years to be realized, China's potential capability to deliver should not be underestimated.

The author thanks Major Carri "ELF" Salas, USAF and Lt Col Mark Stokes, USAF (Ret.) for carefully reading previous drafts of this article and providing valuable feedback.

Dr. Marcus Clay is an analyst with the U.S. Air Force's China Aerospace Studies Institute (CASI). The views expressed are those of the author, and do not reflect the official policy or position of the U.S. Air Force, Department of Defense, or other agencies of the U.S. Government.

Notes

[1] See: Department of Defense, *Electromagnetic Spectrum Superiority Strategy*, October 2020.p.2. Accessed at: https://media.defense.gov/2020/Oct/29/2002525927/-1/-1/0/ELECTROMAGNETIC_SPECTRUM_SUPERIORITY_STRATEGY.PDF

[2] Specifically, the quote refers to the “electromagnetic spectrum/domain” in the PLA lexicon, after “land, sea, air and space,” as defined by the Chinese Defense White Paper.

[3] See: Huang Ruixuan, et al, “Design of a Pre-Bunched THz Free Electron Laser,” *Particles*, 2018,1, 267–278; accessed at: <https://www.mdpi.com/2571-712X/1/1/21/htm>. For an informative discussion about the military applications of THz, see: Damien Johnson, “Terahertz Technologies and Future Security Environments,” <https://othjournal.com/2020/02/28/terahertz-technologies-and-future-security-environments/>.

[4] DARPA’s THz Electronics Program reportedly pushed the radiofrequency technology into the trillions of cycles per second, or THz, range, in 2016. This was achieved through two key inventions, namely, the solid-state power amplifier (SSPA), and traveling wave tube amplifier (TWTA), a miniaturized device that relies on a tiny vacuum chamber in which electrons and radio signals interact. See: <https://www.darpa.mil/program/thz-electronics>, <https://www.darpa.mil/news-events/2016-07-12>.

[5] In July 2017, this was combined with two other CAS entities - Institute of Remote Sensing and Digital Earth, and Academy of Opto-electronics – to form the Aerospace Information Research Institute (AIR/空天信息创新研究院/“空天院”), http://www.aircas.cas.cn/index_73758.html.

[6] Nian Fushun (年夫顺) and his team in 2018 created the “world’s first integrated THz test and measurement system” that covers 50 GHz-500 GHz. This has been applied to key national projects including “broad-band mobile communications,” Fengyun satellite, air and space-based communications platforms, radar imaging, and new security body scanners. http://www.qdast.org.cn/art/2017/12/15/art_1186_70976.html

[7] This is the author’s translation of the name of the lab to match the actual meaning of its Chinese name. The official English name for the lab, according to the website of the lab, is National Key Lab of Science and Technology on Communications. See: <http://www.ncl.uestc.edu.cn/sysgk1/jgsz.htm>.

[8] See: Jianjun Ma et al., “Security and eavesdropping in terahertz wireless links,” *Nature*, October 15, 2018, <https://www.nature.com/articles/s41586-018-0609-x>.

[9] See: Mu Jinchao, Sun Zhaoyang, Liu Hao, “THz real-time Sensing and Surveillance Detection Technology for Aerospace Applications (面向空天应用的太赫兹波实时态势感知与监视探测技术),” Compiled

Papers of the 3rd Space Electronic Strategy Forum, 2017.
<http://gb.oversea.cnki.net/KCMS/detail/detail.aspx?filename=DZZL201712002017&dbcode=CPFD&dbname=CPFD2018>.

[10] See: <https://www.monch.com/mpg/news/ew-c4i-channel/3881-chinesewhispers.html>.

[11] See: Liang Meiyuan, Deng Chao, Zhang Cunlin, "THz Radar Imaging Technology (太赫兹雷达成像技术)," *Journal of Terahertz Science and Electronic Information Technology*, Vol.11, No.2, April 2013.
http://webcache.googleusercontent.com/search?q=cache:4dZhYYZ1hjYJ:www.iaeej.com/xydzgc/ch/reader/download_pdf.aspx%3Ffile_no%3D20130207%26year_id%3D2013%26quarter_id%3D2%26falq%3D1+%&cd=1&hl=en&ct=clnk&gl=uk&client=firefox-b-1-d

[12] Wang Xiaohai, "Application and Research Progress of THz Radar Technology in Space Applications (太赫兹雷达技术空间应用与研究进展)," *Space Electronic Technology (空间电子技术)*, Vol. 1, 2015. pp.7-1

[13] Note that this institute is included in the U.S. Department of Commerce's Entity List. See:<https://www.federalregister.gov/documents/2018/08/01/2018-16474/addition-of-certain-entities-and-modification-of-entry-on-the-entity-list>.

Mongolia's Economic Recovery from COVID-19 Dependent on China

By Antonio Graceffo

Introduction

Mongolia responded quickly to the initial outbreak of COVID-19 in China this past January. The country issued its first public health warning about the new virus and asked citizens to wear masks on January 10; shut down schools throughout the country by January 24; and began shutting down its border with China (the longest land border in the world) on January 28 ([NEMA \(Mongolia\)](#), various dates; [Montsame](#), January 27). These early measures appeared to have successfully controlled the coronavirus; as of November 10, Mongolia had reported a total of 374 COVID-19 cases and zero deaths due to the virus ([Montsame](#), November 10).



Image: Mongolian health workers and police wear hazmat suits during coronavirus drill in the capital of Ulaanbaatar (Image source: [AFP](#)).

The WHO has produced a documentary touting Mongolia's response efforts, and global experts have praised Mongolia's successful handling of the virus even as more developed countries suffered repeated waves of infections ([WHO \(Youtube\)](#), November 2; [FSI Stanford](#), May 19). At the same time, Mongolia's pandemic control policies took a major toll on its economy, leading international organizations such as the Red Cross and the UN to declare their concerns about the impact of COVID-19 on Mongolia's future economic development ([UN](#), July 25; [Red Cross](#), September 28). Following approximately a decade of positive economic growth, Mongolia's GDP this year is set to fall by a staggering 9.7 percent ([NSO \(Mongolia\)](#), undated).

Early Impacts of COVID-19 on the Mongolian Economy

Amid nationwide lockdowns in January, Mongolian imports fell by 6.2 percent and exports by 24.4 percent, resulting in the country's first trade deficit since 2014. The country's economic slowdown was exacerbated in mid-February when Mongolia's State Emergency Commission moved to restrict coal exports, which account for a substantial portion of Mongolia's economy ([The Ulaanbaatar Post](#), February 13). The mining sector had driven much of Mongolia's double digit growth in the early 2010s, and in 2019 accounted for 25 percent of the country's GDP and 90 percent of its total exports ([Montsame](#), January 21).[1] China is by far Mongolia's largest trading partner, making up 64.4 percent of total foreign trade and 89.1 percent of its total export in 2019 ([Montsame](#), January 24). Consequently, the relative health of the Mongolian economy is closely connected with mineral sales and its trade relationship with China, both of which were dealt severe blows this year.

China was Mongolia's top export and import partner in 2020, purchasing 68 percent of Mongolia's total exports and supplying 35 percent of total imports from January to July. Trade with China during this period fell by 10.7 percent compared with the year before. In total, Mongolia's total foreign trade fell by 16.7 percent during the first half of 2020 ([Xinhua](#), August 13).



Image: A border agent in protection gear inspects a truck transferring coal in Ulaanbaatar. (Image source: [Montsame](#)).

Coal

Because of COVID-19, coal exports were paused in mid-February and resumed in a limited capacity on March 31. During the first half of 2020, the volume of coal exported from Mongolia to China fell to almost half of the previous year's numbers ([Xinhua](#), March 31). The decline was partly caused by border restrictions, but

also partly due to China's effective moratorium on manufacturing and construction during the country's national COVID-19 lockdowns ([SCMP](#), March 4).

Mongolia's own pandemic prevention protocols also hurt its mining sector. Following the declaration of a national emergency in January, new regulations lowered the number of workers allowed to work each shift and mines began working at a lower capacity.[2] The closure of transport hubs hurt the mining industry's itinerant labor supply, further reducing mining production.

Hospitality

In the past three years, tourism has made up around 10 percent of Mongolia's annual GDP ([Montsame](#), May 17, 2019). Considering the country's vast natural resources and potential for eco-tourism, the Mongolian government has focused on expanding tourism as a means of driving economic growth. Following trilateral agreements between China, Russia, and Mongolia to boost tourism in 2015, the volume of Chinese tourists to Mongolia has grown steadily. Last year, China became the largest source of foreign tourists to Mongolia, accounting for 36.4 percent of total foreign tourist arrivals ([Xinhua](#), October 26, 2015; [travel168](#), July 24, 2019). With foreign travel restricted under Mongolia's COVID-19 border controls this year, hospitality and tourism revenues plummeted. Total revenue for Mongolia's hospitality sector fell by 42.9 percent year on year in the first half of 2020 ([Intellinews](#), July 9). According to the author's interviews with industry members, the Mongolian tourism season usually takes place during the summer and early autumn. Tourism operators believe that they have lost their window of income for the year.[3]

Mongolia's government has extended its national emergency status on a month-by-month basis since January, creating a perpetual state of widespread uncertainty for business owners and operators. Bat Purev, former Director General of Mongolia's Financial Regulatory Commission of Mongolia, said that the economic situation became dire around April. Big hotels cancelled their telecom services because they had no guests, and individuals stopped paying for phone service. "Prepaid phone service is very sensitive to personal income." Purev explained. "So, many people just stopped paying or renewing their prepaid service. We believe it is a mirror of the health of the general economy. When things are bad, people do not spend on data plans and internet".[4]

China's Coronavirus Recovery

China's economy saw a dramatic recovery in May and June after the government began lifting its nationwide COVID-19 lockdowns. While early growth was driven by pent-up demand, strong state investments in infrastructure and technology have continued to drive China's economic recovery. Following an initial GDP contraction of 6.8 percent in the first quarter of 2020, China's economy saw Q2 gains of 3.2 percent and Q3 gains of 4.9 percent. As the rest of the world struggled to contain the virus, China's early successes in containing the virus allowed it to reopen comparatively early, with state-led monetary loosening and credit

easing policies driving recovery particularly in the manufacturing and construction industries ([SCMP](#), August 18). And while official government sources have avoided setting concrete GDP growth targets this year, China's central bank governor Yi Gang predicted in mid-October that the economy would grow by about 2 percent this year ([Caixin](#), October 19).

China's official shift away from focusing on GDP growth targets amid the pandemic was long-expected but still surprising; the ruling Chinese Communist Party (CCP) has long tied its legitimacy to achieving strict targets for national economic growth and development. Instead of setting GDP targets, the CCP's leadership has instead focused on creating new jobs as the economy recovers from historic labor shocks due to the pandemic ([SCMP](#), June 7). China's surveyed unemployment rate stood at 5.4 percent in September, marking slow but steady recovery following an unemployment high of 6.2 percent in February (*Ibid.*, [NBS](#), October 19).

Foreign analysts have warned that the methodology by which China's National Bureau of Statistics (NBS) collects unemployment data overlooks rural and migrant workers who were disproportionately affected by pandemic-related lockdowns. As a result, some outsiders have raised concerns that China's real unemployment rates may be much higher than what is officially stated—potentially as high as 20 percent ([ANI](#), August 3). In a recent survey of China's economic recovery from COVID-19, analysts raised particular concerns about divergence in the levels of activity reported from large and small manufacturing firms, as well as a continued drop in manufacturing employment, emphasizing the uneven nature of China's economic recovery ([SCMP](#), October 31).

Still, as the rest of the world economy has continued to falter, China has become one of the few drivers of global demand. Its recovery in the fall was driven by a 11.4 percent year on year increase in exports and a smaller 4 percent increase in imports. Most recently, signs of recovering consumer demand—which was especially affected by the pandemic and noticeably slower to recover than other sectors—have given analysts cautious optimism in China's recovery from COVID-19 ([SCMP](#), November 10).

Apart from—but also as with all things in 2020, implicitly connected to—the pandemic, China's economy also faces a raft of other challenges which could impact its continuing growth. Some of these challenges include: ongoing U.S.-China trade tensions, including a raft of tariffs explicitly targeting the high technology industries that China is relying on to sustain its economic recovery ([SCMP](#), May 24, 2019); a declining international reputation linked to COVID-19 and the resurgence of trade tensions with other major trade partners such as Australia ([Pew Research](#), October 6; [Caixin](#), September 17); and fears of food shortages following a swine flu outbreak and historic flooding in the summer ([China Brief](#), July 29; [The Standard \(HK\)](#), November 10). Beef prices in particular have soared as import regimes were affected by the pandemic ([YuanTalks](#), August 31). Fears of a winter resurgence of COVID-19 have also added to China's economic uncertainties.

Mongolian Recovery Tied to China

China's coal imports overall increased earlier this year amid falling fuel prices and a manufacturing and construction boom, but its imports from Mongolia fell ([AmCham \(Mongolia\)](#), July 30). Bat Purev, former Director General of Mongolia's Financial Regulatory Commission, blames Mongolia's regulatory regime for the reduction of coal exports to China, citing in particular bureaucratic delays in implementing a new green channel and border facilitation program. These policies are aimed at streamlining paperwork and quarantine requirements for goods and services passing through border controls.[4]

Purev explains, "Mongolia's economy is very small, and the export revenue comes largely from coal and copper concentrates." A minor adjustment to border regulations or a relatively small shift in, say, Chinese buying from Mongolia instead of Australia, would bring the economy back to normal. "It would only take a few million tons of coal and a few tens of thousands of tons of copper concentrate for us to recover." Purev also added that "Mongolia's total coal exports are only 10 percent of China's demand. This means a slight improvement in the border regime could easily return us to full capacity." [5]

Improving Mongolia's export regime will lead to an increase in foreign currency inflows: "Mongolia is an open economy, but financially it's like a closed economy with not much revenue capital flow," says Bat Purev. "That is why I feel it will be easier to recover...It will be the same as we did in 2008 and 2009 global financial crisis. We experienced maybe one to two quarters decline, and recovered very quickly because of the increase in the volume of coal exports." [6]

Conclusion

In 2008, China's economic recovery from the global financial crisis resulted in a boom in Mongolian exports of coal and raw materials. China's current economic recovery may provide a similar bright spot for Mongolia. It is possible that as China once again hinges its economic recovery on manufacturing and construction, it will increase demand for raw materials and fuel from Mongolia.

Additionally, Chinese food shortages this year connected to a swine flu outbreak, summer flooding, and depressed international supply chains could also create opportunities for Mongolian meat exports. China is currently the world's largest consumer and importer of meat ([DCCC](#), January 31), and is predicted to consume more as domestic consumption recovers.

A landmark 2016 agreement first opened up China's meat markets to Mongolian suppliers, but persistent disease outbreaks and an inability to meet international food safety standards have hurt Mongolia's ability to scale up its meat exports in a meaningful way.[7] In 2019, the country's leaders expressed interest in increasing exports of non-mining sectors to China and set goals of increasing revenues from meat exports by ten-fold. ([The Ulaanbaatar Post](#), February 22, 2018; [Xinhua](#), May 15, 2019). If Mongolia could find a way to

maintain its export standards, it could stand to benefit immensely by supplying China's current meat shortages. Changes in regulation could boost the export of coal and meat to China and help Mongolia achieve a full economic recovery from COVID-19.

Antonio Graceffo, PhD is an economic researcher and China analyst based out of Ulaanbaatar, Mongolia.

Notes

[1] For more on how the mining sector has driven Mongolia's economic growth and contributed to a national shift away from agriculture and pastoralism, see: Nicholas Muller, "Mongolia's New Mining Boom," *The Diplomat*, October 22, 2019, <https://thediplomat.com/2019/10/mongolias-new-mining-boom/>.

[2] Author's interview with Bat Purev, former Director General of Mongolia's Financial Regulatory Commission, on August 4, 2020.

[3] *Ibid.*

[4] *Ibid.*

[5] *Ibid.*

[6] *Ibid.*

[7] See: "Mongolia's Trade and Investment Roadmap (2019-2023) – Strategic Response Paper," October 2018, Ministry of Foreign Affairs of Mongolia, 22.
