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Indo-US Foundational Agreements: Contributing to India's Military Capabilities

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Key Points:

- India and the United States (US) have signed several bilateral agreements based on their shared interests, which greatly enhance India's military capabilities.
- For the US, countering China comes at the top of its Indo-Pacific agenda through all available means including strengthening and arming India.
- For India, the assistance coming from the US helps it in achieving its vision of regional dominance. Also, the US' investments and access to the Indian market proves beneficial for both countries.
- US-backed Indian force modernization and competitiveness comes with considerable implications for the region.
- Due to its increased military capabilities, India's assertiveness is growing in its relations with the smaller states in South Asia. The situation provides Pakistan with more opportunities for enhancing cooperation with those smaller countries.
- However, Pakistan's resource constraint will be a major impediment in its response to the subsequent bilateral challenges.

INTRODUCTION

he India-US strategic partnership has grown over the years into a significant guiding force in their bilateral relations. After decades of non-alignment and low profile, India started to realize the need to develop ties with the US towards the end of the Cold War due to multiple factors. However, it was during the Presidency of George W. Bush, when India started playing an essential role in the US foreign policy towards Asia.¹ Both countries have entered into a series of bilateral defence and security agreements, including the four foundational

bases for cooperation. For the US, countering China comes at the top of its Indo-Pacific agenda through all available means including strengthening and arming India. For India, the assistance coming from the US helps it in achieving its vision of regional dominance. Furthermore, the US' investments and access to the Indian market proves beneficial for both countries.

agreements during this period. From military to economic interest, India and the US have found strong

India has not only gained access to high-tech US weapon systems but to highly sensitive real-time intelligence data from the US. These are adding to the Indian force modernization and competitiveness with severe implications for regional countries.

¹ Amit Gupta, *The U.S-India Relationship: Strategic Partnership or Complementary Interests?* (Carlisle: Strategic Studies Institute, 2015). 5.

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US-INDIA STRATEGIC PARTNERSHIP

Indian Ministry of External Affairs defines its relations with the US as a global strategic partnership based on shared democratic values and convergence of interests on bilateral, regional, and international issues.2 Based on these shared interests, both countries have signed several bilateral agreements to formalize their partnership. They signed Next Steps in Strategic Partnership (NSSP) in 2004 paving the way for bilateral activities and trade in space, civil nuclear energy, high technology, and cooperation on missile defence.3 The steps under this initiative were completed by July 2005.4 Next, they signed the New Framework for India-US Defence Relationship in 2005.5 This agreement sought to intensify defence trade and exchange between the armed forces of the two countries. The states renewed the contract for another ten years in 2015.6

Moreover, India and the US launched the Civil Nuclear Cooperation Initiative on July 18, 2005.⁷ India committed to separate and bring its civilian nuclear facilities under the International Atomic Energy Agency's (IAEA) safeguards.⁸ Later, both countries also launched the Defence Technology and Trade Initiative (DTTI) in 2012 to modernize India's military-industrial base, including jet engines and the aircraft carrier.⁹

However, the Indo-US strategic partnership has not been as smooth as it could be. There has been some reluctance on the part of India to enter into those foundational agreements which could impose unilateral obligations on India or concerns over its strategic autonomy. But looking back at the Indo-US strategic partnership and its evolution in 2020, Indian concerns over strategic autonomy look less significant as compared to the benefits it is securing from the US.

US-INDIA FOUNDATIONAL AGREEMENTS

India and the US have signed four foundational agreements for enhanced military cooperation. The arrangements range from sharing and protecting military information to the basing and refuelling of aircraft and joint exercises. These agreements provide the necessary groundwork and create common standards and systems to enhance interoperability between militaries and frameworks for the sale and transfer of high-end technologies. The sale and transfer of high-end technologies.

For the US, these are routine agreements that it signs with its partners.¹² However, the deals have met scepticism and even opposition in India.¹³ New Delhi has raised concerns on the intrusion of the US into the Indian communication systems after signing these agreements.¹⁴ Therefore, the two sides have amended the contracts and tailored them to remove Indian concerns.

General Security of Military Information Agreement

General Security of Military Information Agreement (GSOMIA) was the first foundational agreement signed between the two countries in 2002. The deal facilitated more generous intelligence sharing between the two countries. It also obligated both countries to protect each other's sensitive information. The discussions on the Indian request to purchase F-5G aircraft fell apart in 1981 due to the American concerns. The apprehensions were related to the leaking of sensitive information

² "Brief on India-U.S. Relations," *Ministry of External Affairs*, last modified June 2017, https://www.mea.gov.in/Portal/ForeignRelation/India_US_brief.pdf.

³ "United States - India Joint Statement on Next Steps in Strategic Partnership," *US State Department,* last modified September 17, 2004, https://2001-2009.state.gov/r/pa/prs/ps/2004/36290.htm.

^{4 &}quot;India and United States Successfully Complete Next Steps in Strategic Partnership," Ministry of External Affairs, last modified July 18, 2005,

https://www.mea.gov.in/bilateral-documents.ht-m?dtl%2F6789%2FIndia+and+United+States+Successfully+Complete+Next+Steps+in+Strategic+Partnership

⁵ "New Framework for the India - U.S. Defence Relationship," *Manohar Parrikar Institute for Defence Studies and Analysis*, last modified June 28, 2005, https://idsa.in/resources/documents/Ind-US-Def-Rel-28.06.05.

⁶ Elizabeth Roche, "India, US renew defence pact for 10 more years during Ash Carter's visit," *Live Mint*, last modified June 4, 2016, https://www.livemint.com/Politics/9DBFubFlHzdDyMIDhCorKI/India-US-clear-2-groundbreaking-defence-projects-as-Ash-Ca. html.

Text of the agreement is available here, "New Framework for the India - U.S. Defence Relationship," *US Department of Defense*, last modified June 03, 2015, https://archive.defense.gov/pubs/2015-Defense-Framework.pdf

⁷ "U.S. - India: Civil Nuclear Cooperation," *US Department of State*, accessed on November 27, 2020, https://2001-2009.state.gov/p/sca/c17361.htm.

⁸ Ibid.

⁹ "Fact Sheet: U.S.-India Defense Relationship," Department of Defense, accessed on November 27, 2020, https://archive.defense.gov/pubs/US-IND-Fact-Sheet.pdf.

¹⁰ "The Hindu Explains | How will the Basic Exchange and Cooperation Agreement deepen India-U.S. military ties?," *The Hindu*, accessed on November 1, 2020, https://www.thehindu.com/news/national/the-hindu-explains-how-will-the-basic-exchange-and-cooperation-agreement-deepen-india-us-military-ties/article32993733.ece.

¹¹ Dinakar Peri, "What is LEMOA?," *The Hindu*, last modified August 30, 2016, https://www.thehindu.com/news/national/What-is-LEMOA/article15604647.ece.

¹² Mark Rosen and Douglas Jackson, "The U.S.-India Defense Relationship: Putting the Foundational Agreements in Perspective," CNA Analysis & Solutions, (February 2017): iii, https://apps.dtic. mil/dtic/tr/fulltext/u2/1028519.pdf.

¹³ Ibid, 1

¹⁴ Rajat Pandit, "India re-examining US pacts that could give access to top-notch weapons like armed drones," *Times of India*, last modified May 2, 2018, https://timesofindia.indiatimes.com/india/india-re-examining-us-pacts-that-could-give-access-to-top-notch-weapons-like-armed-drones/articleshow/64006089.cms.

¹⁵ Wang Shida, "The Challenge of India-US Security Cooperation to India's Tradition of Strategic Independence," *CIR* 29, no. 3 (May/June 2019): 47, http://www.cicir.ac.cn/UpFiles/file/20200228/637 1847869381966374066448.pdf.

about the effectiveness of engine to the Soviet Union, and the use of technologies to advance other areas such as nuclear, space, and dual-use technologies by India. Therefore, both countries signed a Memorandum of Understanding (MoU) on technology transfer in 1984. However, the US insisted on signing GSOMIA as an additional condition and India kept refusing to sign it until 2002. 17

Besides, the agreement was a significant development in that it was signed after the removal of the US sanctions imposed on India after the latter's nuclear tests in 1998. For India, the Global War on Terror (GWoT) after the 9/11 attacks also provided the impetus for it to sign the agreement. Other factors such as the need to explore new options to diversify its defence procurement after the collapse of the Soviet Union also affect the Indian decision making.¹⁸ The agreement also paved the way for broader India-US cooperation and the signing of more deals in the future. India and the US started several military exercises after this arrangement, including the resumption of the Malabar naval exercise in 2002.¹⁹

Furthermore, New Delhi and Washington signed an extension to the GSOMIA, the Industrial Security Annex (ISA) in 2019, during the 2+2 ministerial dialogue. ISA allows the US defence companies to partner with the Indian private sector to manufacture military platforms, including fighter jets.²⁰

Logistics Exchange Memorandum Agreement

Logistics Exchange Memorandum Agreement (LEMOA) was the second foundational agreement signed between the two countries in 2016. It is the Indian version of the Logistics Support Agreement (LSA). LEMOA allows both countries to access the designated military facilities on either side for refuelling and replenishment.²¹ Earlier, the payments for holding exercises at each other's facilities were made each time they were held. However, under the LEMOA, a mechanism including bookkeeping and appointment of designated LEMOA officer has

¹⁶ Cherian Samuel, "Indo-US Defence Cooperation and the Emerging Strategic Relationship," *Strategic Analysis* 31, no. 2 (2007): 209-236.

been established among other means to settle payment issues.²²

Besides, the agreement covers joint military exercises, training, port calls, humanitarian missions, and other mutually agreed military activities.²³ The scope of logistical support under this agreement is said to not cover offensive weapons.²⁴ The contract allows only logistic support and not the basing of the military on each other's bases.

"The term 'logistic support, supplies, and services' means food; billeting; transportation (including airlift); petroleum; oils; lubricants; clothing; communications services; medical services; ammunition; base operations support (and construction incident to base operations support); storage services; use of facilities; training services; spare parts and components; repair and maintenance services; calibration services; and port services. Such terms include temporary use of general-purpose vehicles and other nonlethal items of military equipment which are not designated as significant military equipment on the United States Munitions List promulgated pursuant to section 38(a)(1) of the Arms Export Control Act."²⁵

LEMOA is incredibly beneficial to the Indian Navy mainly. It is helping India increase its naval outreach manifold due to the logistical support available at the US bases across the world. It is also enhancing the training and skills of the Indian Navy.

Communications Compatibility and Security Agreement

The third foundational agreement, Communications Compatibility and Security Agreement (COMCASA) was signed during the inaugural 2+2 defence and foreign ministerial dialogue of India and the US in 2018.²⁶ COMCASA is the tweaked version of the Communications and Information Security Memorandums of Agreement (CISMOA) just like the LEMOA.

COMCASA is more sensitive and vital than the ²² Ibid.

¹⁷ Ibid.

¹⁸ Rosen and Jackson, "The U.S.-India Defense Relationship," 2.

¹⁹ Adarsha Verma, "The Malabar Exercises: An Appraisal," *Manohar Parrikar Institute for Defense Studies and Analysis*, last modified July 18, 2017, https://idsa.in/idsacomments/the-malabar-exercises_averma_180717.

²⁰ Dinakar Peri, "Industrial Security Annex opens Indian private partnerships for U.S. defence firms," The Hindu, last modified December 19, 2019, https://www.thehindu.com/news/ national/defence-ties-with-us-set-to-deepen-rajnath-singh/ article30344918.ece.

²¹ Peri, "What is LEMOA?" *The Hindu*, last modified August 30, 2016.

²³Zeeshan Munir, "Logistics Exchange Memorandum of Agreement," *Center for Strategic and Contemporary Research*, last modified November 3, 2016, https://cscr.pk/explore/themes/defense-security/logistics-exchange-memorandum-of-agreement/.

²⁴ Shida, "The Challenge of India-US Security Cooperation to India's Tradition of Strategic Independence," 53.

²⁵ Rosen and Jackson, "The U.S.-India Defense Relationship," 9.

²⁶ "India-US sign COMCASA: What is it and how does it help Indian defence?," *Business Standard*, last modified September 6, 2018, https://www.business-standard.com/article/economy-policy/india-us-sign-comcasa-what-s-what-and-how-it-helps-indian-defence-118090600988_1.html.

LEMOA, which is limited to logistics only. The US maintains that the COMCASA is a "technology enabler" helping the transfer of high-tech avionics, encrypted communication, and electronic systems to India as well as ensuring the secrecy of its C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) systems.²⁷ It also establishes secure communication channels and services.

In addition, COMCASA allows the US to transfer to India specialized equipment for encrypted communication on the US-supplied platforms like the C-17, C-130, and P-8Is. These platforms use commercial level communication technologies in the absence of COMCASA.²⁸

The agreement is intensifying the integration of India's several military platforms and thus increasing their tactical communication capabilities. It will also allow the US to install, Link-16 and Identification Friend or Foe (IFF) on P-8I, transfer single channel ground airborne radio systems, digital transponders, secure voice terminals, and satellite communication (SATCOM) trans-receivers.²⁹ Similarly, it will enable the US to export an advanced version of Sea Guardian drones to India.³⁰

However, India has some concerns over the CISMOA agreement. Those include data leakage, viewing it as an intrusive measure, US penetration of India's command and control, and also reduced strategic autonomy of India. CISMOA required US officials to enter, install and inspect US propriety equipment at Indian military facilities and platforms. India also had feared data leakage to third parties including Pakistan that operates US-made F-16 aircraft. It is also a worry that the penetration of the US in the Indian command and control will enable it to listen to or monitor India's communication in operations and share it with third parties such as Pakistan where the US is neutral or adversarial.³¹

Basic Exchange and Cooperation Agreement

The Basic Exchange and Cooperation Agreement (BECA) for geo-spatial cooperation, was recently signed during the third 2+2 ministerial dialogue on October 28, 2020. It is the last of the four foundational agreements signed between both countries.³²

The agreement would allow India access to real-time US topographical, nautical, and aeronautical data. The data will facilitate India in the navigation of missiles and drones, and the planning of forces. It will also enable India to receive training at the US National Geospatial-Intelligence College.³³

Also, BECA will greatly help India as the country has technical and technological limitations in these areas.³⁴ Likewise, it will provide a framework for India to receive advanced navigational aids and avionics on the US provided aircraft, the absence of which has affected the navigational and flight management of them.³⁵ Besides, BECA is an umbrella agreement under which the Department of Defence (DOD) and National Geospatial Agency (NGA) can sign a subsidiary agreement with their Indian counterparts.³⁶ The US has signed such agreements with 57 countries.³⁷

IMPLICATIONS FOR THE REGION AND PAKISTAN

The signing of these foundational agreements intensifies the Indo-US strategic partnership. India seems to be on the receiving end of vital technological and technical information and systems. These agreements 1) bring India closer to the US, 2) give India access to advanced US intelligence information, 3) enable it to buy top US weapons systems with their full potential, 4) beef up Indian military muscles vis-à-vis its neighbours, 5) and make its ambitions of becoming a regional hegemon more realistic.

These deals also give substantial benefits to the US such

²⁷ Pandit, "India re-examining US pacts that could give access to top-notch weapons like armed drones," *Times of India*, last modified May 2, 2018.

²⁸ Dinakar Peri, "What is COMCASA?" *The Hindu*, last modified September 6, 2018 https://www.thehindu.com/news/national/what-is-comcasa/article24881039.ece.

²⁹ P K Mallick, "2+2 Dialogue and Indo US Relations," VIF Paper, *Vivekananda International Foundation*, October 2018, p. 9 https://www.vifindia.org/sites/default/files/Two-Plus-Two-Dialogue-and-Indo-US-Relations.pdf.

³⁰ APP, "India to purchase 22 American sea guardian drones," *The News*, last modified May 16, 2019 https://www.thenews.com.pk/print/472071-india-to-purchase-22-american-sea-guardian-drones.

³¹ P K Mallick, "2+2 Dialogue and Indo US Relations," *VIF Paper* (October 2018): 13, https://www.vifindia.org/sites/default/files/Two-Plus-Two-Dialogue-and-Indo-US-Relations.pdf.

³² "Watch | India and U.S. sign BECA," *The Hindu*, last modified October 28, 2020, https://www.thehindu.com/news/international/india-and-us-have-signed-beca/article32962324.ece.

³³ Abhinandan Mishra, "Intelligence: Indian agencies get a BECA boost," *Sunday Guardian Live*, last modified October 31, 2020, https://www.sundayguardianlive.com/news/intelligence-indianagencies-get-beca-boost.

³⁴ RK Sharma, "Proposed US Foundational Agreements between US and India," *Centre for Air Power Studies*, last modified May 13, 2016, http://capsindia.org/files/documents/CAPS_Infocus_RK_SHARMA_00.pdf.

³⁵ Ajai Shukla, "US high-tech arms to India stumble on safeguards," Business Standard, last modified January 20,
²013, https://www.business-standard.com/article/

²013, https://www.business-standard.com/article/economy-policy/us-high-tech-arms-to-india-stumble-on-safeguards-110052500033 1.html.

³⁶ Rosen and Jackson, "The U.S.-India Defense Relationship," 11.

³⁷ Ibid, 12.

as 1) boosting its status of a major defence supplier to India, 2) giving it more inroads into the Indian security architecture, 3) financial benefits of having a larger share in Indian military procurement, 4) raising a counterweight against China, 5) and providing the US with a major partner in Asia.

However, such closer Indo-US strategic partnership has security implications for the region. From the US perspective, the collaboration aims at arming India against China mainly. But, India has more goals to achieve from this partnership other than countering China. The increase in India's conventional and strategic capabilities will increase its regional dominance. Realtime and sensitive information along with the advanced weapons systems, will also considerably affect Indian relationship with Pakistan.

All four agreements have implications of different nature, though. The scope of GSOMIA, COMCASA, and BECA is related to mostly intelligence and information security and sharing and thus has more security implications. In contrast, the LEMOA is concerned with logistics and services and has a different impact on Indian military build-up than the other three, which are related to intelligence, communication, and data and technology sharing.

Besides, India has procured 11000 Extreme Cold Weather Clothing System (ECWCS) kits from the US, made possible by LEMOA. The clothing system will be provided to the Indian Army deployed in Ladakh during the winter.³⁸

Furthermore, COMCASA and BECA will enable India physically by providing weapons systems and necessary aids. The arrangements will also ensure the bilateral exchange of unclassified data which can provide targeting and navigation aid, thereby, increasing the accuracy of Indian ballistic and cruise missiles and armed drones.³⁹ Similarly, Indian supersonic and hypersonic weapons will also get benefited from these advancements. These developments will add to the counterforce temptations of India. Besides, the enhanced situational awareness of India will also contribute to its plans of surgical strikes inside Pakistan.⁴⁰

Correspondingly, India can conduct drone strikes across

the Line of Control (LoC) with the help of geospatial data received under BECA.⁴¹ The same agreement will assist New Delhi in extensive monitoring of activities on the northern and western border.⁴² Indian military can, thus, prepare timely to respond to those activities.

Reportedly, India signed the COMCASA deal with the US after the US influenced its decision-making on the agreement by providing intelligence information on the deployment of the Chinese forces, which proved to be beneficial to India during the Doklam Standoff in 2017.⁴³ Similarly, India has signed BECA months after the recent standoff in Ladakh. It indicates the Indian thinking of increasing cooperation with the US to strengthen its position in a crisis with China or Pakistan. This situation, therefore, brings the current geopolitical competition between the US and China to the region and Pakistan. Smaller regional countries in South Asia will also face a challenging situation. Indian assertiveness on them will increase as its military and diplomatic engagement with the US increases. They may be forced to choose or go against the interests of the US and India. India's assertiveness is also increasing in its bilateral relations with them. Besides, this situation also provides Pakistan with more opportunities for enhancing cooperation with them.

Pakistan's Options

The situation becomes complex for Pakistan after the massive scale of cooperation between the US and India.⁴⁴ Pakistan can react to India-US partnership by focusing on measures and technological development locally and find options and help from other countries. It already enjoys strong military relations with China that can offset many implications of Indo-US cooperation for Pakistan. Interoperability between Pakistan and Chinese forces has been increasing with the growth of more common systems and exercises.

Pakistan has reportedly signed for the military use of

³⁸ Abhishek Bhalla, "India buys winter clothing from US and Europe for Ladakh troops," *India Today*, last modified October 16, 2020, https://www.indiatoday.in/india/story/india-buys-winter-clothing-ladakh-troops-us-europe-1732371-2020-10-16.

³⁹ S.M. Hali, "BECA — a new Indo-US bilateral agreement," *The News*, last modified November 2, 2020, https://www.thenews.com.pk/print/737917-beca-a-new-indo-us-bilateral-agreement.

⁴⁰ Adil Sultan, "India-US Basic Exchange and Cooperation Agreement," *Strategic Foresight for South Asia*, last modified October 28, 2020, https://strafasia.com/india-us-basic-exchange-and-cooperation-agreement-beca/.

⁴¹ Ibid.

⁴² "How BECA Will Help India Monitor Its Borders? – Full Report," *Business Line*, last modified November 2, 2020, https://www.businessline.global/how-beca-will-help-india-monitor-its-borders-full-report/.

⁴³ "US Provided India Intelligence Input On Chinese Troop Deployments During Doklam Stand-Off, Hints Report," *Swarajya*, last modified September 5, 2018, https://swarajyamag.com/insta/this-is-how-us-helped-india-during-the-73-day-military-stand-off-with-china-in-doklam.

⁴⁴ "US move to share military data with India alarms FO," *Dawn*, last modified October 28, 2020, https://www.dawn.com/news/1587335/us-move-to-share-military-data-with-india-alarms-fo.

China's BeiDou navigation system.⁴⁵ The reliance on the American Global Positioning System (GPS) has become risky due to the nature of the US' relations with Pakistan and India. Under the framework of China Pakistan Economic Corridor (CPEC), both countries have also laid down fibre along the CPEC route, which will be an alternative and secure channel of communication between them.46 Pakistan is also collaborating with China for the development of its space sector.⁴⁷ However, the current Pakistan-China military cooperation is not as extensive and broad as the India-US collaboration has become after the signing of several agreements. Pakistan does not have formal agreements to access China's sensitive military intelligence and technology. After India becoming a formal partner of the US, the closeness between Pakistan and China is also likely to grow, and everything related to it may not be made public.

However, cooperation with China aside, Pakistan should also seek a good relationship with the US, although the latter has strong anti-China sentiments in the conduct of its foreign policy which limits its options of engagement with Pakistan.

Furthermore, the Indian space program is way ahead of Pakistan. To catch up, Pakistan should invest in its domestic space sector, encourage the private sector, and strictly follow its Space Vision 2047.⁴⁸ Similarly, the state should also invest in the development of cyber/anti-cyber and electronic warfare measures to deter Indian capabilities. Investing in relevant technologies is necessary for the country so that it is not left behind in critical areas that might compromise national security.

In addition to reciprocal measures, developing a defence mechanism to enhance the security of vital instalments in the face of COMCASA and BECA induced threats is also necessary for Pakistan. These include countermeasures against Indian missiles, development of advanced early warning systems, increasing the security of sensitive facilities, and beefing up its cyber defence measures.

CONCLUSION

The two decades of Indo-US strategic partnership is becoming a major determinant in the dynamics of the regional environment. It is also giving a boost to the former's conventional and strategic capabilities including, space, missile, and nuclear. India is getting advanced weapons systems from the US with support to utilize their full potential. For countries like China and Pakistan, this has direct security implications. Such accumulation by India increases the asymmetries in the conventional and strategic forces between India and Pakistan, which in turn are fuelling change in India's conventional and nuclear doctrines.

Thus, these challenges require Pakistan to plan accordingly and plug the gaps in its conventional and nuclear forces. Pakistan's resource constraint, however, will be a major impediment in its response to those challenges. Therefore, building its economic weight and diplomatic clout are foundational steps for Islamabad to prepare for future challenges.

While both Islamabad and Beijing are already collaborating militarily, this cooperation is likely to increase given the growth in their mutual interests. The development of CPEC, Indo-US opposition to it, and the threats from India-US strategic partnership will augment the Pakistan-China cooperation. However, this should not mean that Pakistan should cut itself from the US. Islamabad ought to keep the dialogue open with Washington.

In a nutshell, the India-US Foundational Agreements greatly enhance India's military capabilities, which Pakistan should watch closely to maintain peace and stability in the region.

⁴⁵ "China's 'full' BeiDou navigation system to boost accuracy of Pakistan's missiles?" *The Week*, last modified April 01, 2020, https://www.theweek.in/news/world/2020/04/01/china-full-beidou-navigation-system-to-boost-accuracy-of-pakistan-missiles. html.

⁴⁶ Abdul Rauf, "Pak-China Optical Fibre Cable (OFC) Project – Opportunities and Challenges," Pivot 1, (January 1, 2019): 26-28, https://www.researchgate.net/publication/332932485_Pak-China_Optical_Fibre_Cable_OFC_Project_-_Opportunities_and_Challenges.

⁴⁷ Miqdad Mehdi and Jinyuan Su, "Pakistan Space Program and International Cooperation," *United Nations Office for Outer Space Affairs*, accessed on November 27, 2020, https://www.unoosa. org/documents/pdf/psa/activities/2019/UNJordanWorkshop/ Presentations/P.7_Poster_Jordan_Confrence.pdf.

⁴⁸ Gulraiz Iqbal, "The Fall and Rise of Pakistan's Space Ambitions," South Asian Voices, last modified September 11, 2020, https://southasianvoices.org/the-fall-and-rise-of-pakistans-space-ambitions/.