

# ISAS Working Paper

No. 300 – 26 July 2018

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## South Asia's Space Programmes: Development and Diplomacy

*The recent launch of the Bangabandhu-1, Bangladesh's first geostationary satellite to orbit, marks yet another example of the growing use of space technology for development among the South Asian countries. The expanding use of space technology in the region has given China and India more opportunities to continue using technological cooperation as a tool of diplomacy. This paper argues that India still needs to raise its game in South Asia to cope with the rapid advances in Chinese space diplomacy in the region.*

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### Introduction

The Bangladesh government sent *Bangabandhu-1*, its first geostationary satellite, to orbit on 11 May 2018. Bangladesh joins the growing list of developing countries that own a national satellite. Within South Asia, India has long had one of the world's most advanced space programmes. Pakistan too has been making significant investments in its national space programme. Before Bangladesh sent its satellite to orbit, Afghanistan and Sri Lanka have had

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their satellites in operation since 2014 and 2012 respectively. India, which has long had a record of international space cooperation, started focusing on space diplomacy towards the region by launching the South Asia Satellite in 2017. In turn, Pakistan's refusal to join this project under the umbrella of the South Asian Association for Regional Cooperation (SAARC) did bring to the fore the usual political problems associated with regional cooperation in South Asia. Meanwhile, India finds itself competing with China on space diplomacy, as in so many other domains, in the region. Beijing, which has long had intensive space cooperation with Pakistan, is now reaching out to other nations of South Asia. This paper argues that India needs to intensify its space partnerships with its South Asian neighbours in order to cope with the rapid advances of Chinese space diplomacy in the region. This paper is divided into four sections. The first reviews the various national space programmes in South Asia. The second looks at India's South Asia Satellite and its current engagement with the other South Asian countries. The third analyses China's engagement in space diplomacy with India's neighbours and the final section looks at how India can make its space diplomacy more dynamic and attractive to its neighbours.

## **National Space Programmes**

India has one of the world's most successful space programmes. It is also one of the most comprehensive. India builds and launches its own satellites. What began as an endeavour for national development has gained commercial credibility over the decades as well. As India rises on the global stage, its space programme has also begun to acquire a strategic dimension.<sup>2</sup> India's space programmes officially began in 1962, when the Indian government set up the India National Committee for Space Research (INCOSPAR) under its Atomic Energy Authority. INCOSPAR was instrumental in setting up the Thumba Equatorial Rocket Launching Station, India's first space port, in the same year that it was established. A year later, in 1963, India launched its first rocket with the assistance of the United States (US)-based National Aeronautics and Space Administration (NASA) and French-based Centre national d'études spatiales (CNES). INCOSPAR also advised the government on space research while promoting international collaboration. Between 1963 and 1968, India had

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<sup>2</sup> For recent comprehensive account of India's space programme, see Marco Aliberti, *India in Space: Between Utility and Geopolitics* (Springer International, 2018).

already witnessed launching a total of 65 rockets, some of which were for Britain, France, the US and the Soviet Union. After INCOSPAR grew into the Indian Space Research Organisation (ISRO) in 1969, space development acquired a new momentum. India launched its first satellite, *Aryabhata*, in 1975, while under the ISRO, various centres were also established for wide-ranging purposes. These include the Space Application Centre for remote sensing and meteorological purposes, while the Development and Educational Communication Unit is involved in the socio-economical evaluation of space applications.

International collaborations with India also surged under the ISRO. The ISRO dedicated its Thumba Equatorial Rocket Launching Station to the United Nations (UN) in the late 1960s, as a goodwill gesture towards the international community. Having received expansive support from the US, the Soviet Union, France, the United Kingdom (UK) and West Germany for its national space programme, India was eager to pay back.<sup>3</sup> A notable trait of India's international cooperation in space programmes is its ability to effectively internalize the transfer of technologies through cooperation and apply them for social development. One instance was that after the ISRO-NASA satellite instructional television experiment in 1975, the Indian government began to telecast educational programs to over 2,400 villages.<sup>4</sup> This, in turn, allowed the farmers to receive specific guidance in seasonal adaptation and modernising agricultural practices.

As its space programme matured in the last decades of the 20<sup>th</sup> century, India's international space profile began to rise. Since 1999, India's ISRO have helped launch of 237 foreign satellites of 28 countries.<sup>5</sup> In 2008, India launched its first lunar probe called *Chandrayaan-1*. It is expected to land a lunar rover in 2018. India has ambitious plans for a Mars probe orbiting the planet since 2014. India is also preparing for an ambitious manned flight in the coming years.

As India's space programme evolved, it helped to create an advanced high-technology industrial eco system in India that has boosted commercial space activity. In 2017, India

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<sup>3</sup> 'Golden Jubilee Celebration of TERLS'. *Department of Space, Indian Space Research Organisation*. <https://www.isro.gov.in/golden-jubilee-celebration-of-terls>. Accessed on 5 July 2018.

<sup>4</sup> Karan Jani. 'Impact of International Cooperation for Sustaining Space-Science Program'. *Cornell University Library, Physics and Society*. <https://arxiv.org/abs/1610.08618>. Accessed on 28 June 2018.

<sup>5</sup> 'List of Foreign Satellites Launched by PSLV'. [https://www.isro.gov.in/sites/default/files/article-files/missions-0/237\\_foreign\\_satellites.pdf](https://www.isro.gov.in/sites/default/files/article-files/missions-0/237_foreign_satellites.pdf). Accessed on 22 June 2018.

launched scores of nano-satellites from a single rocket into orbit, belonging to US companies, and to Israel, Kazakhstan, the Netherlands, Switzerland and the United Arab Emirates. Over the years, the ISRO has successfully transferred technology to a range of large and medium enterprises.<sup>6</sup> This has allowed India to respond to the rising international market for space-based services.

Pakistan was not too late in emulating India's space programme, as in the nuclear domain. Founded in 1961, the Pakistan Space and Upper Atmosphere Research Committee (SUPARCO) [later Commission in 1981] had achieved some level of success in its early years. The SUPARCO launched the two two-stage rockets, *Rehbar-I* and *Rehbar-II* in 1962 to collect metrological data over the Arabian Sea. At that point in time, it was the third country in Asia and tenth in the world to have conducted such a launching, alongside developed nations such as the US, the Soviet Union, France, the UK and Italy.<sup>7</sup> Nonetheless, the next few decades saw minimal developments, against the backdrop of the militarisation of Pakistan's existing space programmes and agencies. It was only after 1990 that the SUPARCO begin to regain its potential. Pakistan launched its first domestic satellite, *Badr-1*, in 1990, and, subsequently, *Badr-2*, in 2001. Pakistan is also attempting to regain its participation on the international space front. In the last two decades, the SUPARCO increased its association with international bodies, such as the Asia Pacific Space Cooperation Organization (in 2005), the Asia-Oceania Space Weather Alliance (in 2012) and the China Great Wall Industry Corporation (in 2008) Cooperation. On outreach efforts, it invited Malaysia, Nigeria, the UN and the Asia-Pacific Space Cooperation Organisation representatives to its 2012 National Space Conference, organised by the SUPARCO.

Bangladesh is the latest South Asian country to join India, Pakistan, Sri Lanka and Afghanistan in having its own national satellite. *Bangabandhu-1*, a geostationary satellite, was launched to orbit on 11 May 2018. Equipped with 40 transponders, Bangladesh plans to

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<sup>6</sup> Prasad Nagendra, Narayan. "Space 2.0 India: Leapfrogging Indian space commerce". *ORF Online*. 28 February 2017. <https://www.orfonline.org/expert-speak/space-india-leapfrogging-commerce/>. Accessed on 28 June 2018.

<sup>7</sup> 'History, Pakistan Space & Upper Atmosphere Research Commission. *Pakistan Space & Upper Atmosphere Research Commission*. 22 June 2018. <https://web.archive.org/web/20080417192331/http://www.suparco.gov.pk/pages/history.asp>. Accessed on 22 June 2018.

use 20 for video services to its newly introduced Direct-to-Home television, disaster recovery and national e-learning initiatives, while the rest will be rented out to other countries.<sup>8</sup>

Sri Lanka's space development remains largely for domestic commercial usage. While a liberalised 1991 Sri Lanka Telecommunication Act saw the establishment of the Sri Lanka Telecom and Sri Lanka Telecommunication Authority, the country depends on India to obtain services through the Indian Geo-stationary series of satellites in orbit as a result of a memorandum of understanding signed with the Indian government in 1995.<sup>9</sup> It only launched its first private space and communication satellite, *SupremeSAT-1*, in November 2012, from a joint effort by SupremeSAT (Pvt) Ltd and the China state-owned company, China Great Wall Industry Corp.<sup>10</sup> Currently, there are plans to launch its second commercial satellite, Supreme SAT-II in 2018. Both are aimed at enhancing Sri Lanka's domestic telecommunication services.

Of the remaining South Asian countries, Afghanistan, Nepal and Bhutan are also taking steps to progress their national space development. Afghanistan's first space satellite, *Afghansat 1*, was officially inaugurated in May 2014 by then-vice-president of Afghanistan, Mohammad Younus Qanuni, and then-minister of communications and information technology, Amirzai Sangin.<sup>11</sup> Kabul's second satellite, *Afghansat 2*, is in the works. Like Sri Lanka, the current *Afghansat 1* is meant to expand Afghanistan's information and communication technology sector. Bhutan, on the other hand, is working with Japanese Aerospace Exploration Agency, to help launch its first Cubesat, *Bhutan-1*, a tiny, 1.5 kilogramme and low altitude satellite, for geographic observation purposes.<sup>12</sup> Nepal is also planning to get its own national satellite.

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<sup>8</sup> 'Press Release On Bangladesh joins Space Age'. *Ministry of Foreign Affairs, Bangladesh*. 13 May 2018. [http://www.mofa.gov.bd/site/press\\_release/ed1ba0d7-47a1-4602-8220-e3577c78b78f/Press-Release-On-Bangladesh-joins-Space-Age](http://www.mofa.gov.bd/site/press_release/ed1ba0d7-47a1-4602-8220-e3577c78b78f/Press-Release-On-Bangladesh-joins-Space-Age). Accessed on 22 June 2018.

<sup>9</sup> H S Padmasiri de Alwis. 'Advancement In Space Science Technology In Sri Lanka', 1999. [http://adsbit.harvard.edu/cgi-bin/nph-iarticle\\_query?1999ESASP.430...97P&defaultprint=YES&filetype=.pdf](http://adsbit.harvard.edu/cgi-bin/nph-iarticle_query?1999ESASP.430...97P&defaultprint=YES&filetype=.pdf). Accessed on 22 June 2018.

<sup>10</sup> 'SupremeSAT Press Release'. *SupremeSAT*. 28 November 2012. <http://www.supremesat.com/supremesat-press-release/>. Accessed on 5 July 2018.

<sup>11</sup> 'Ministry Communications & IT Officially Opens Afghan Sat 1'. *Ministry of Communication & Information Technology, Islamic Republic of Afghanistan*. 11 May 2014. <http://mcit.gov.af/en/news/ministry-communications-it-officially-opens-afghan-sat-1>. Accessed on 28 June 2018.

<sup>12</sup> 'BHUTAN-1 Country's First Cubesat'. *Bhutan Times*. 28 February 2018. <https://bhutantimes.com/article/bhutan-1-country-s-first-cubesat>. Accessed on 22 June 2018.

According to the Nepal Telecommunication Authority, the satellite could be used to promote communication, connectivity and governance.<sup>13</sup>

## India and the South Asia Satellite

Although India's record on international space cooperation is expansive, as mentioned, its regional space engagement was quite limited. Breaking this mould, Indian Prime Minister Narendra Modi offered to build and launch a satellite for the eight member nations of the SAARC in June 2014, a month after his swearing in as prime minister. Addressing the ISRO scientists, Modi asked them "to take up the challenge, of developing a SAARC Satellite that we can dedicated to our neighbourhood, as a gift from India."<sup>14</sup> At the 18<sup>th</sup> SAARC Summit in Nepal in November 2014, he expanded on the idea, "...India's gift of a satellite for the SAARC region will benefit us all in areas like education, telemedicine, disaster response, resource management, weather forecasting and communication..."<sup>15</sup>

In responding to the Indian initiative, the SAARC Secretariat, based in Kathmandu, referred the project to its SAARC Technical Committee on Science and Technology for an evaluation.<sup>16</sup> Pakistan initially exhibited enthusiasm and, by June 2015, offered to provide technical and monetary assistance for the project, while proposing that the project be brought under the SAARC authority. However, India turned down both the SAARC Secretariat's proposal and Pakistan's offer, maintaining that the satellite is an Indian gift and is a satellite *for* the SAARC, and not a SAARC satellite. By March 2016, the Ministry of External Affairs of India announced that Pakistan has decided to opt out of the project. India subsequently changed the project's name to 'South Asia Satellite'. Afghanistan also continued to show some hesitation in joining the project, citing concerns that the South Asia Satellite's position

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<sup>13</sup> 'Nepal To Have Its Own Satellite Soon'. *Nepali Telecom*. 8 May 2017. <https://www.nepalitelecom.com/2017/05/nepal-satellite-soon.html>. Accessed on 22 June 2018.

<sup>14</sup> 'Text speech of PM Narendra Modi at PSLV-C23 launch at Sriharikota'. *Narendra Modi Official Website*. <https://www.narendramodi.in/text-speech-of-pm-narendra-modi-at-pslv-c23-launch-at-sriharikota-6334>. Accessed on 28 June 2018.

<sup>15</sup> 'Text of Prime Minister's speech at 2014 SAARC Summit in Nepal'. *Narendra Modi Official Website*. <https://www.narendramodi.in/text-of-prime-ministers-speech-at-2014-saarc-summit-in-nepal-6941>. Accessed on 28 June 2018.

<sup>16</sup> Shounak Set. 'India's Regional Diplomacy Reaches Outer Space'. *Carneigie India*. 7 March 2017. [https://carnegieendowment.org/files/7-3-2017\\_Set\\_IndiaRegionalDiplomacy\\_Web.pdf](https://carnegieendowment.org/files/7-3-2017_Set_IndiaRegionalDiplomacy_Web.pdf). Accessed on 22 June 2018.

overlaps with the orbital slot of the positioning of its own satellite, *Afghansat 1*, hence implying duplication of purpose.<sup>17</sup> However, Afghanistan eventually joined in September 2017 after the launch of the South Asia Satellite (in May 2017), with the benefits from the satellite providing a further boost to education and connectivity.<sup>18</sup> Getting overall consensus meant that the project was inevitably delayed. For instance, Sri Lanka signed the Bilateral Agreement between India and Sri Lanka on Orbit Frequency Coordination of Satellite for the SAARC Region early in September 2015.<sup>19</sup> Bangladesh signed a similar agreement with India in March 2017.

South Asian leaders, except those from Pakistan, responded warmly to the Indian initiative when the South Asia Satellite was launched in May 2017.<sup>20</sup> Under the agreed sharing arrangements, each participating country was to be given access to at least one transponder of the South Asia Satellite.<sup>21</sup> On the ground, according to the ISRO, the satellite helped launch valuable remote sensing applications for the South Asian countries. The applications include agriculture, land use, forestry, geology, urban, water and disaster response.<sup>22</sup> Bhutan has utilised the South Asia Satellite to expand its Bhutan Broadcasting Service television and radio channels in remote areas.<sup>23</sup> Bangladesh has also announced plans to use the South Asia Satellite for research purposes, in which its own national satellite can complement the former.<sup>24</sup> Kabul is requesting New Delhi for the development of a special satellite.<sup>25</sup> Despite

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<sup>17</sup> 'After Pakistan, Afghanistan shows no interest in PM Narendra Modi's satellite project'. *The Economic Times*. 15 May 2018. <https://economictimes.indiatimes.com/news/science/after-pakistan-afghanistan-shows-no-interest-in-pm-narendra-modis-satellite-project/articleshow/52278620.cms>. Accessed on 28 June 2018.

<sup>18</sup> 'Joint Statement on the 2<sup>nd</sup> Strategic Partnership Council Meeting between India and Afghanistan, New Delhi (September 11, 2017). *Ministry of External Affairs, Government of India*. 11 September 2017. [http://mea.gov.in/bilateral-documents.htm?dtl/28936/Joint\\_Statement\\_on\\_the\\_2nd\\_Strategic\\_Partnership\\_Council\\_Meeting\\_between\\_India\\_and\\_Afghanistan\\_New\\_Delhi\\_September\\_11\\_2017](http://mea.gov.in/bilateral-documents.htm?dtl/28936/Joint_Statement_on_the_2nd_Strategic_Partnership_Council_Meeting_between_India_and_Afghanistan_New_Delhi_September_11_2017). Accessed on 5 July 2018.

<sup>19</sup> Ministry of External Affairs, Government of India, 'List of Agreements/ MoU signed during the visit of Prime Minister of Sri Lanka to India'. 15 September 2015. <http://www.mea.gov.in/media-briefings.htm?dtl/25810/List+of+AgreementsMoUs+signed+during+the+visit+of+Prime+Minister+of+Sri+Lanka+to+India>. Accessed on 22 June 2018.

<sup>20</sup> K V Venkatasubramanian. 'South Asian Satellite to boost regional communication'. *Press Information Bureau, Government of India, Special Service and Features*. 7 May 2017. [http://pib.nic.in/newsite/print\\_release.aspx?relid=161611](http://pib.nic.in/newsite/print_release.aspx?relid=161611). Accessed on 22 June 2018.

<sup>21</sup> Ibid.

<sup>22</sup> Government of India, Department of Space. 'Annual Report 2017-2018'. [https://www.isro.gov.in/sites/default/files/flipping\\_book/AnnualReport2017-18-en/index.html#99](https://www.isro.gov.in/sites/default/files/flipping_book/AnnualReport2017-18-en/index.html#99). Accessed on 21 June 2016.

<sup>23</sup> Yeshi Gyaltshen. 'South Asia Satellite will help BBS expand its reach: MoIC Minister'. 17 November 2017. <http://www.bbs.bt/news/?p=84853>. Accessed on 22 June 2018.

<sup>24</sup> Muhammad Zahidul Islam. 'Bangladesh links up with India's South Asia Satellite'. *The Daily Star*. 8 March 2018. <https://www.thedailystar.net/business/bangladesh-links-indias-south-asia-satellite-1545130>. Accessed on 22 June 2018

many initial reservations and some delay in implementation, the South Asia Satellite project was an important step forward towards regional space cooperation in the Subcontinent by leveraging on India's well-known technical expertise.

## **The Chinese Factor**

Even as New Delhi celebrates its success with the South Asia Satellite, India faces growing challenges from China's rapid plans for digital and space connectivity across the globe, including in South Asia. According to the Chinese Space White Paper 2016, China has contracted into 43 space cooperation agreements with 29 countries, space agencies and international organisations since 2011.<sup>26</sup> On the larger international front, China also recently announced a decision to allow all UN-member states to use its future space station, which will be operationalised by 2022.<sup>27</sup> Already, this move has drawn interests from national representatives to the UN, including India's neighbour, Sri Lanka. This is on top of Beijing's leadership in a regional space organisation, the Asia-Pacific Space Cooperation Organization, which assist its members, including Pakistan and Bangladesh, to implement their space development policies.

Beijing also launched a number of ambitious initiatives, now being banded together as the "Information Silk Road", a term first mentioned in a March 2015 Chinese White Paper. The Information Silk Road agenda is about strengthening internet infrastructure, deepening space cooperation, developing common technology standards, and improving the efficiency of policing systems among the Belt and Road countries.

In a notable initiative called the Digital Earth under the Information Silk Road, the Chinese Academy of Sciences is establishing two regional research centres – one in Sanya (Hanan Province) and the other in Kashi [also called Kashgar (Xinjiang)] for gathering space-based

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<sup>25</sup> Dipanjan Roy Chaudhury. 'Kabul requests India to launch exclusive satellite for Afghanistan. *The Economic Times*. 8 August 2017. <https://economictimes.indiatimes.com/news/politics-and-nation/kabul-requests-india-to-launch-exclusive-satellite-for-afghanistan/articleshow/59961846.cms>. Accessed on 6 July 2018.

<sup>26</sup> 'China's Space Activities in 2016 – the 4<sup>th</sup> version of white paper'. *China National Space Administration*. February 2017. <http://www.unoosa.org/documents/pdf/copuos/stsc/2017/tech-01E.pdf>. Accessed on 22 June 2018.

<sup>27</sup> 'China invites all UN countries to use its future space station'. *CBC News*. 30 May 2018. <http://www.cbc.ca/news/technology/china-space-station-1.4684363>. Accessed on 22 June 2018.



remote sensing data in support of the projects under the Belt and Road Initiative (BRI).<sup>28</sup> They are tasked to monitor and manage a variety of artificial and natural risks along and around the BRI routes. Beyond remote-sensing, China's BeiDou Navigation Satellite System (*BeiDou-2*), a Chinese-constructed and operated global satellite navigation system set to consist of 35 satellites by 2020, is now open for commercial use across the Asia-Pacific region since 2012.<sup>29</sup>

In South Asia, the China-Pakistan Economic Corridor (CPEC), a flagship project under the BRI, is being aligned with the agenda of the Digital Silk Road. Under a joint CPEC Plan for Pakistan's Digital Future, the two sides have committed to establishing a "new, upgraded fibre optic cable network" connecting Pakistan and China to improve bilateral communications.<sup>30</sup> China is also looking beyond Pakistan. In 2017, China's Huawei signed an agreement to construct the Pakistan East Africa Cable Express that would connect Pakistan to Kenya via Djibouti.<sup>31</sup> These fibre optic links with Pakistan are being complemented by the integration of Pakistan into the Beidou satellite navigation system. *Beidou* has reportedly begun to replace Pakistan's earlier reliance on US Global Positioning System satellite navigation systems.<sup>32</sup> In March 2018, the SUPARCO signed a contract with the China Great Wall Industry Corp to jointly launch the *PakSat* Multi Mission Satellite.<sup>33</sup> Beijing is also planning to launch two remote sensing satellites this year for Pakistan.<sup>34</sup> Quite clearly, China-Pakistan space cooperation has come a long way since Pakistan's first satellite, *Badr-1*, was launched by the Chinese in 1990.<sup>35</sup>

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<sup>28</sup> Song Jianlan. 'DBAR Initiative: Big Earth Data for "Belt and Road" Development'. 2018 [http://www.english.cas.cn/bcas/2016\\_2/201607/P020160722472279008627.pdf](http://www.english.cas.cn/bcas/2016_2/201607/P020160722472279008627.pdf). Accessed on 22 June 2018.

<sup>29</sup> 'China's Beidou GPS-substitute opens to public in Asia'. *BBC*. 27 December 2012. <http://www.bbc.com/news/technology-20852150>. Accessed on 22 June 2018.

<sup>30</sup> 'China, Pakistan Bypass India as CPEC Digital Routes are Developed'. *Silk Road Briefing*. 12 October 2017. <https://www.silkroadbriefing.com/news/2017/10/12/china-pakistan-bypassing-india-cpec-digital-route-s-developed/>. Accessed on 22 June 2018.

<sup>31</sup> 'Huawei Marine and Tropical Science Commences Work on the Construction of the PEACE Submarine Cable Linking South Asia with East Africa'. *Huawei*. 6 November 2017. <http://www.huawei.com/en/press-events/news/2017/11/PEACE-Submarine-Cable-SouthAsia-EastAfrica>. Accessed on 29 June 2018.

<sup>32</sup> 'China's Beidou Navigation Satellite System has started to cover entire Pakistan'. *Times of Islamabad*. 13 February 2018. <https://timesofislamabad.com/13-Feb-2018/pakistan-s-reliance-on-us-gps-ends-as-china-s-beidou-navigation-satellite-system-has-started-to-cover-entire-pakistan>. Accessed on 22 June 2018.

<sup>33</sup> 'Pakistan Signs New Satellite Contract with China (CGWIC)'. *Quwa*. 27 March 2018. <https://quwa.org/2018/03/27/pakistan-signs-new-satellite-contract-with-china-cgwic/>. Accessed on 22 June 2018.

<sup>34</sup> 'China to launch remote sensing satellites for Pakistan in June'. 3 April 2018. *Xinhua News Agency*. [http://www.xinhuanet.com/english/2018-04/03/c\\_137085832.htm](http://www.xinhuanet.com/english/2018-04/03/c_137085832.htm). Accessed on 22 June 2018.

<sup>35</sup> Ankush Ajay Wagle. 'The "South Asia Satellite": India's Space Programme as a Regional Policy Tool'. ISAS Briefs No. 480, Institute of South Asian Studies, National University of Singapore. 9 May 2017.

Beijing is well-positioned to extend its space and digital connectivity initiatives with several of India's other neighbours. In January 2018, both Nepal and China have operationalised an optic fibre link, providing Nepal an alternative route to internet services through China.<sup>36</sup> Nepal and China had, earlier in 2014, also launched the Sino-Nepal Joint Research Centre for Geography to focus on a study of mountain geography and environmental monitoring using remote sensing technologies, as a push for science and technology cooperation.<sup>37</sup> Currently, Nepal is in talks with China on its first national satellite in planning. Similarly, Afghanistan has worked with China to develop the former's second satellite, known as *Afghansat 2*, while also having begun earth connectivity in linking 4,800 kilometres of fibre optic line from Kashgar (China) to Faizabad (India) through the Wakhan region (Afghanistan).<sup>38</sup> For Sri Lanka, both its current and upcoming satellites, *Supreme SAT-I* and *Supreme SAT-II*, are being developed by Chinese developers. In 2017, Chinese *Beidou* Navigation Satellite System also announced its plan to set up at least 10 of its Continuously Operating Reference Stations in Sri Lanka.<sup>39</sup> Specifically targeting the entire South Asia market, China is also building a cloud storage centre, to be operationalised by end 2018, in Lhasa, Tibet, to serve trade and investments between Chinese and South Asian companies.<sup>40</sup>

## India's Challenge

Unlike China's BRI, there has been little or no debate within the Indian strategic and foreign policy communities on the implications of China's Digital Silk Road projects within the Subcontinent. While this poses long term strategic challenge for India, New Delhi is not without some options. For one, India still wields strong influence in space diplomacy, both internationally and in the region. In the last 60 years, India's ISRO has emerged as the sixth

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[https://www.isas.nus.edu.sg/wp-content/uploads/media/isas\\_papers/ISAS%20Briefs%20No.%20480-%20South%20Asia%20Satellite.pdf](https://www.isas.nus.edu.sg/wp-content/uploads/media/isas_papers/ISAS%20Briefs%20No.%20480-%20South%20Asia%20Satellite.pdf). Accessed on 22 June 2018.

<sup>36</sup> 'Nepal-China cross-border optical fiber link starts operation'. *Xinhua News Agency*. [http://www.xinhuanet.com/english/2018-01/12/c\\_136891112.htm](http://www.xinhuanet.com/english/2018-01/12/c_136891112.htm). Accessed on 5 July 2018.

<sup>37</sup> 'China, Nepal to boost cooperation in mountain studies'. *Xinhua News Agency*. 27 April 2018. [http://www.xinhuanet.com/english/2018-04/27/c\\_137140785.htm](http://www.xinhuanet.com/english/2018-04/27/c_137140785.htm). Accessed on 22 June 2018.

<sup>38</sup> 'China Partnered with Afghanistan on Optic Fiber Link'. *Central Asian Cellular Forum*. 21 April 2017. <https://www.3gca.org/china-partnered-with-afghanistan-on-optic-fiber-link/>. Accessed on 22 June 2018.

<sup>39</sup> Deyana Goh. 'China to Develop At Least 10 BeiDou Satellite Stations in Sri Lanka'. *Spacetechnica*. 3 April 2017. <http://www.spacetechnica.com/china-to-develop-at-least-10-beidou-satellite-stations-in-sri-lanka/>. Accessed on 22 June 2018.

<sup>40</sup> 'Big data center to service companies in Tibet'. *Xinhua News Agency*. 27 March 2018. [http://www.xinhuanet.com/english/2017-03/27/c\\_136161791.htm](http://www.xinhuanet.com/english/2017-03/27/c_136161791.htm). Accessed on 27 June 2018.

largest space research organisation worldwide. India is also party to all five major international treaties on outer space activities, while having signed more than 30 bilateral agreements with space agencies of other countries. India's successful deployment of the Mars Orbiter in 2014 and over 100 nano-satellites recently in 2017 also continue to signal its prominence in the international space arena.

Some of its regional neighbours, such as Afghanistan and Bhutan, continue to look to India as a major working partner. India too has responded positively to the interest in Thimphu and Kabul, two major recipients of India's development assistance.<sup>41</sup> India's Department of Space also established the Indian Institute of Space Science and Technology to offer graduate courses for students from the region. Under the umbrella 'Act-East' policy, India has also reached out to partners from the Association of Southeast Asian Nations, like Vietnam, in the construction of ground stations for satellite tracking.<sup>42</sup> Since early 2002, India's ISRO has developed collaboration with Indonesia's space agency, National Institute for Aeronautics and Space.<sup>43</sup>

As it competes with China on regional space cooperation, India is handicapped by three important factors. One is the lack of scale for its commercial space programme. The traditional developmental emphasis in India's space programme has indeed been complemented by the creation of a commercial arm called the Antrix which was set up in September 1992 under the Department of Space. However, it does not have the mass and impact of Chinese space companies. The second was the Western non-proliferation sanctions on the Indian space programme through the 1980s and 1990s. Thanks to the historic civil nuclear initiative, India's differences with the international community on non-proliferation have largely been resolved. India is also a member of the Missile Technology Control Regime. India has a long way to go, however, in building substantive space industrial partnerships with the Western technology companies. A third weakness has been India's inability to integrate substantive advanced capabilities into its regional diplomacy and

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<sup>41</sup> Moltz, J. C. 'Asia's space race. National Motivations, regional rivalries, and international risks'. 2012 New York: Columbia University Press.

<sup>42</sup> Sanjeev Miglani, Greg Torode. 'India to build satellite tracking station in Vietnam that offers eye on China'. 25 January 2016. *Reuters*. <https://in.reuters.com/article/india-vietnam-satellite-china-idINKCN0V309W>. Accessed on 22 June 2018.

<sup>43</sup> 'ISRO Signs MOU with Indonesian Space Agency'. 3 April 2002. *Department of Space, Indian Space Research Organisation*. <https://www.isro.gov.in/update/03-apr-2002/isro-signs-mou-with-indonesian-space-agency>. Accessed on 28 June 2018.

security strategy. Although international cooperation has been an important component of India's space programme, New Delhi never lent it any strategic and security dimensions. As a result, it has tended to neglect the possibilities for bilateral and regional cooperation with its immediate neighbours in the Subcontinent and Indian Ocean. Overcoming these three factors is an urgent imperative for India to remain a critical player in the emerging geopolitics of space technology in the region.

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