ODI Global

Briefing Note

China’s growing space and communications presence in Africa

Fact sheet

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Key messages

China has emerged as a key financial and technical assistance partner to several African countries in their space sector development ambitions – Chinese companies have been involved in approximately 20% of foreign satellite technology contracts since 2005.

China’s space activities in Africa are closely tied to its Belt and Road Initiative (BRI), with a focus on creating a Space Information Corridor. This involves technological collaboration, establishment of ground stations, navigation systems (like BeiDou) and leveraging digital infrastructure investments.

China is already a leading player in Africa’s land-based telecommunications infrastructure. Its recent entry into the Low Earth Orbit (LEO) satellite landscape suggests it could expand its offer to BRI partners by deploying satellite internet on the continent.

China plans to launch 40,000 LEO satellites in the next decade, challenging current market leaders like Starlink, and embracing an integrated space and terrestrial communications network.

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China's digital ambitions have long been far-ranging, spanning investments in physical infrastructure (e.g., cables) and cyberspace (software, cloud computing) to outer space (satellites) and the integration of military/civilian fusion technologies. As the domestic market for digital and space-based technologies has become increasingly competitive, Chinese companies have responded to, and benefitted from, growing demand from developing countries for telecommunications infrastructure and space capabilities. This note provides an overview of China's growing investment in commercial and dual use (i) satellite technology and infrastructure, (ii) launch services and facilities, and (iii) telecommunications and space-based activities (satellite internet, Earth observation) in Africa.

1.1 Context

- African countries view space technologies as increasingly vital for achieving development goals and the objectives of the African Union's Africa 2063 strategy. The development of satellites and related infrastructure opens up solutions to critical challenges in agriculture, national resource management, disaster response, and connectivity. Recent data shows that the African space economy is valued at over US$19 billion and is projected to grow by more than 16% by 2026, suggesting that Africa is seen as a new market frontier for the financing and development of space infrastructure by international contractors (Space in Africa, 2022).

- In the last decade, China has emerged as a key player supporting several countries in developing their space programs through financial and technical assistance and training. China's National Space Administration (CNSA) has signed over 170 cooperation agreements or memorandums of understanding with more than 50 countries, space agencies and international organizations (Xinhua, 2023).

- The 14th Five Year Plan includes ambitions to "build a highly efficient communications, navigation, and remote sensing space infrastructure network with a global coverage, as well as establish commercial space launch sites" (Xinhua, 2021). More specifically, a 2022 Space Program White Paper highlights the important role of space cooperation for the Belt and Road Initiative (BRI), particularly through the creation of a Space Information Corridor (SCIO, 2022).

- This expansion represents an interesting evolution in China's space footprint. Until 2014 China's space activities were dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC), the latter being a key defence contractor producing launch vehicles and missile systems (Patel, 2021). In 2014, policy reforms under Xi Jinping's Document 60 allowed private capital and commercial companies to enter the space sector. Significant players now include China Academy of Space Technology (CAST) and China Great Wall Industry Corporation (CGWIC). CGWIC is the only commercial organization authorized by the Chinese government to provide international commercial launch services and satellite product exports.

1.2 Cooperation on disaster risk management and weather forecasting

- Over the years, meteorological collaboration has been an integral part of the China-Africa relationship. Since 2018, the China Meteorological Agency (CMA) has been expanding data access to Fengyun satellites to over 30 African countries.

- The Fengyun-2H satellite provides atmospheric and disaster monitoring services for countries and regions participating in the Belt and Road Initiative. China has established an emergency support mechanism for disaster prevention and mitigation for international users of the Fengyun meteorological satellites, and data from China's meteorological satellites have been widely used in 121 countries and regions (SCIO, 2022).

- A significant development in this programme has been the construction of a dedicated FY-2H satellite direct receiving station in Mozambique, substantially enhancing the country’s meteorological and disaster monitoring capabilities (see Figure 2).

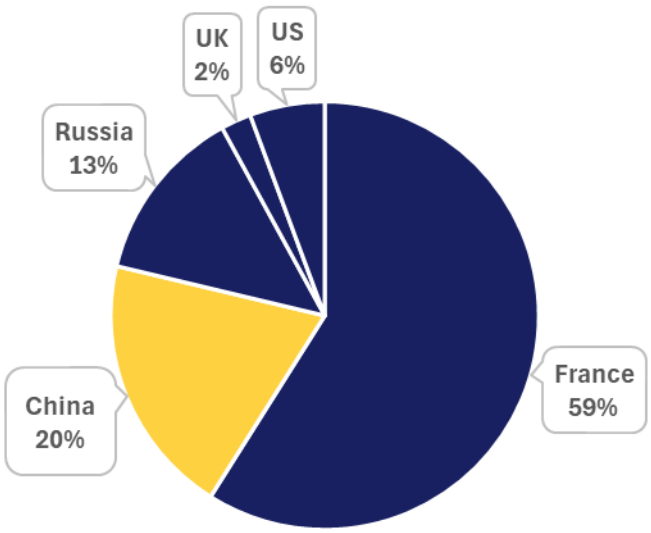
- At COP29 China published its Action Plan on Early Warning for Climate Change Adaptation (2025-2027). The objectives of the plan include enhancing high-frequency information sharing and promoting open regional early warning cooperation in African, Asian and Pacific countries. China also announced plans to launch three Fengyun geostationary meteorological satellites in the next two years (China Meteorological News Press, 2024).

1.3 China’s satellite manufacturing and launches in Africa

- As of November 2024, 62 satellites have been launched by 17 African countries (Spacehubs Africa, 2024). Only a handful of nations – such as Egypt and South Africa – have satellite manufacturing capabilities, but they still rely on foreign-built rockets and overseas launch sites, typically in Russia, China, Kazakhstan, France and the United States. These satellites predominantly target downstream segments of the space sector for socio-economic development uses such as Earth observation (EO) and communications.

- Most satellite activity in Africa is funded by African institutions. In the last decade, China has intensified its space collaboration with the continent through BRI and is a major player, but Chinese companies compete with European, Russian and American firms to win contracts. Between 2005 and 2023, approximately 20% of foreign contracts awarded for acquiring and manufacturing satellite technology in Africa were awarded to Chinese entities (Klinger and Oniosun, 2023).

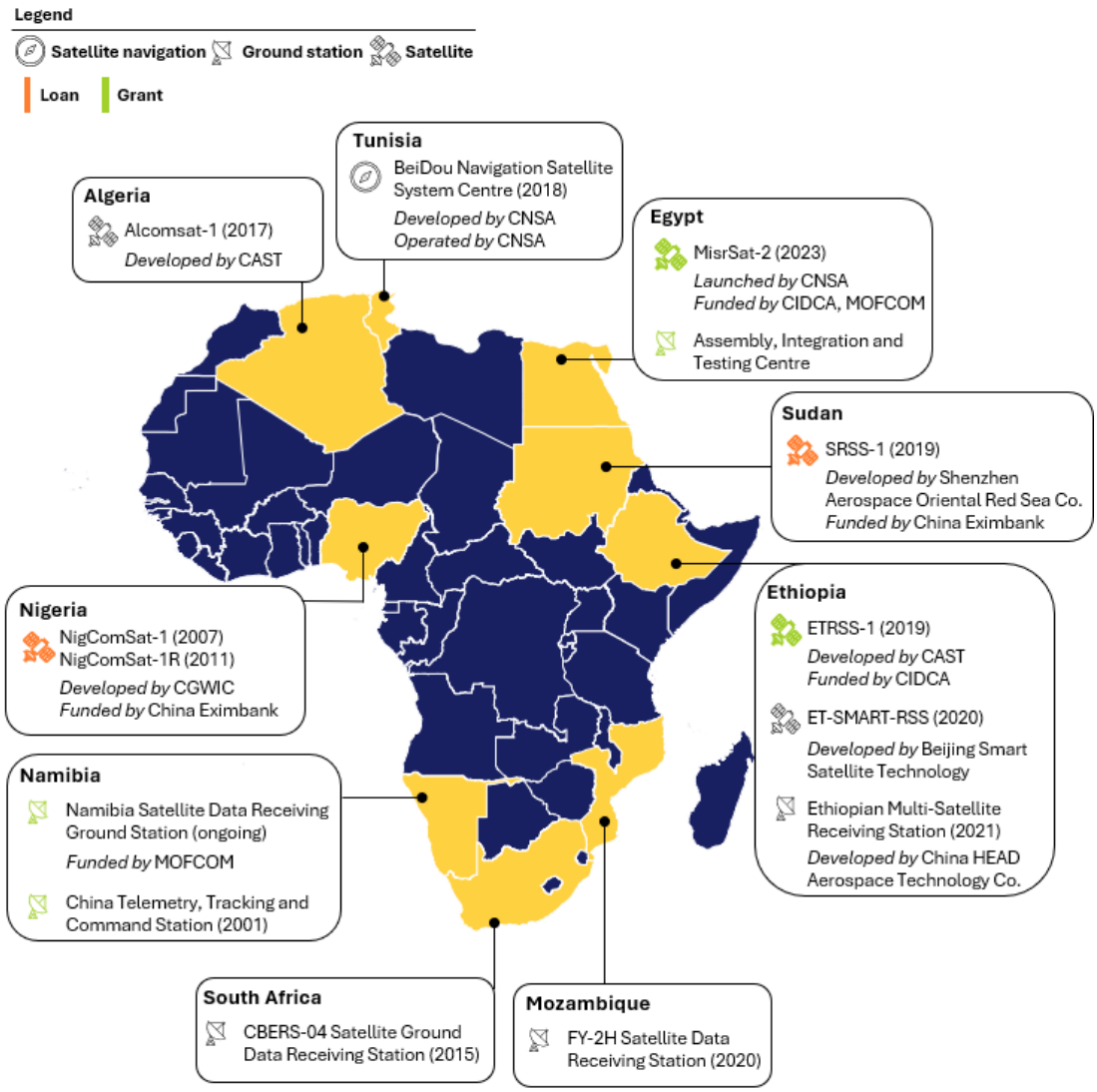
Figure 1 Proportion of contracts awarded for acquiring and manufacturing satellite technology in Africa, 2005-2023



Source: authors' elaborations based on (Klinger and Oniosun, 2023)

- In the last two decades, China has launched satellites for several African countries (see Figure 2) using the Long March rockets operated by the China Aerospace Science and Technology Corporation (CASC), the main contractor for China's space program.

Figure 2 Satellites, ground stations and space-related projects developed by China in Africa



Note: Several projects are jointly funded or operated in partnership with local actors. This map includes information only on Chinese developers, implementing agencies and funders. CNSA: China National Space Administration, CGWIC: China Great Wall Industry Corporation; CIDCA: China International Development Cooperation Agency; MOFCOM: China Ministry of Commerce; CAST: Chinese Academy of Space Technology. Source: authors' elaborations based on AidData (2023), Space in Africa and press search.

1.4 China's ground station infrastructure in Africa

- China is also assisting African countries in the development of ground station infrastructure. Egypt's first satellite assembly, integration and testing (AIT) centre was financed by a Chinese grant. The MisrSat-2 remote sensing satellite launched in 2023 was constructed by the AIT centre. In Ethiopia, China unveiled a multi-satellite ground receiving station at the Entoto Observatory and Space Science Research Centre in Addis Ababa in 2021 (see Figure 2).

- Africa is also important to China's own Tracking, Telemetry, and Command (TT&C) system. China maintains a number of TT&C ground stations outside of China located in BRI countries. The only operational TT&C station in Africa is based in Swakopmund, Namibia and has been operational since 2001. It is mainly used for tracking the re-entry of China's manned space vehicles and for deep space and lunar exploration projects.

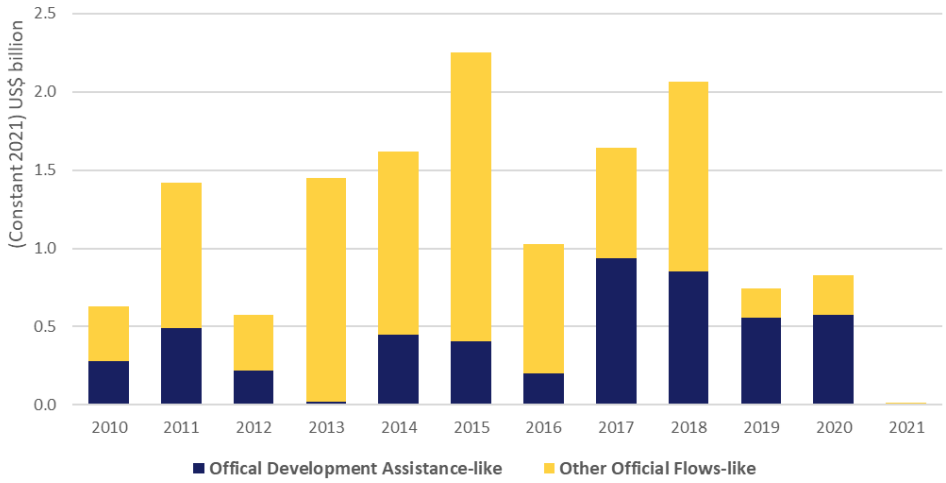
- In 2023, it was announced that Djibouti had signed a memorandum of understanding with Chinese Hong Kong Aerospace Technology for the construction of a US$1 billion spaceport project, the first on the continent (Douet, 2023).

- China has also significantly expanded the global reach of its BeiDou Navigation Satellite System (BDS), a positioning, navigation and timing system which is a direct competitor to the US-developed GPS. Central to this effort is the establishment of the China-Arab BeiDou Centre near Tunis, Tunisia in 2018 to promote the system's use in Africa (China's first overseas BeiDou centre).

1.5 China's telecommunications and satellite internet investments in Africa

- Since 2015 China's Digital Silk Road (DSR) initiative has fostered partnerships in several countries to build mobile networks and data centres, upgrade digital infrastructure, and provide high-tech surveillance equipment. In Africa, 'smart cities' have been defined as a priority area in several Forum on China-Africa Cooperation (FOCAC) plans. Official Chinese lending to Africa's communications sector also reached US$15 billion between 2010 and 2021 (see Figure 3).

Figure 3 China's official communications sector lending to African countries, 2010-2021



Source: authors' elaborations based on AidData (2023).

- While government policy is important in driving China's participation in the global digital market, the globalisation of China's digital

companies began prior to the DSR announcement, with the expansion of private companies, rather than state-owned enterprises. Chinese companies such as Huawei and ZTE now dominate Africa's terrestrial telecommunications infrastructure. Up to 70 percent of Africa's 4G network infrastructure is estimated to have been built by Huawei (Young and Thadani, 2022).

- At the same time, the civilian market for satellite internet is growing due to increasing demand for reliable, low-cost and high-speed data transmission in underserved and remote areas where the extension of terrestrial fiber and wireless networks is challenging. Low Earth Orbit (LEO) satellites orbit much closer to the planet than the traditional geostationary (GEO) satellites and operate a revolving network ("constellation") of multiple satellites to provide continuous internet coverage.

- Leadership in LEO broadband could bring greater control over international communications networks. China is now entering the race for Low Earth Orbit (LEO) satellite internet technology, which is currently dominated by SpaceX's Starlink and Eutelsat OneWeb.[1] Starlink is currently available in 13 African countries but has faced regulatory hurdles.[2] China has an opportunity to enter the satellite internet market in Africa by leveraging its DSR relationships – strengthening BRI cooperation on communication satellites is one of the key priorities outlined in the 2022 Space Program White Paper (SCIO, 2022).

- China has recently proposed several projects with ambitions to launch mega constellations of satellites in Low-Earth Orbit (LEO) for satellite internet access domestically and in underserved markets across the globe. Recently announced projects include the state-backed 13,000 satellite Guo Wang mega-constellation and Qianfan's 14,000 satellite project. Qianfan saw its first 18 satellites launched in August 2024, and plans to fly more than 600 satellites by the end of 2025. Guo Wang is yet to send any satellites into space. These services aim to be direct competitors to Starlink, the US-based and currently most advanced LEO satellite internet provider.[3] Overall, China aims to launch 40,000 LEO satellites in the next decade (Feldstein, 2024).

[1] SpaceX is based in the United States. Eutelsat OneWeb is a recent merger between French Eutelsat and UK-based OneWeb, with headquarters in the United Kingdom. It is the first fully integrated GEO-LEO satellite operator.

[2] Starlink is available in Nigeria, Rwanda, Mozambique, Kenya, Malawi, Benin, Zambia, Eswatini, Sierra Leone, South Sudan, Madagascar, Botswana, Ghana.

[3] As of November 2024, SpaceX has deployed 6,714 operational satellites in orbit and has applied for licenses to send more than 40,000 satellites (Pultarova and Howell, 2024). Eutelsat OneWeb has 654 LEO satellites in orbit (Rainbow, 2024). According to project officials, the Qianfan factory in Shanghai can produce up to 300 spacecraft per year, which is still far behind its Western competitors (Clark, 2024).

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