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INDIA-AFRICA PARTNERSHIP IN THE SPACE SECTOR:

A Strategic Perspective

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India-Africa Partnership in the Space Sector: A Strategic Perspective

Introduction

The bond between India and Africa is a tapestry woven from centuries of shared experiences, mutual understanding, and collaborative efforts. This partnership spans numerous domains, from culture to commerce. Recent years have witnessed a remarkable upswing in economic interactions, with trade figures hitting $90.5 billion[1] in 2022-23 - a testament to the growing synergy between these regions. India's vision for the future is bold, aiming to push this trade to a staggering $200 billion by 2030.[2] Interestingly, the final frontier of space has become a new playground for joint innovation, adding an exciting dimension to this age-old relationship.

India's role in Africa's economic landscape is significant, ranking as the continent's third-biggest trade partner and second-largest creditor. Indian investments in Africa have reached about $74 billion.[3] Key trade pacts like the CECPA with Mauritius and ongoing talks for a PTA with SACU signify the growing economic ties. The DFTP scheme, benefiting 27 African LDCs, is being reviewed for possible expansion to boost trade further. These efforts show both regions' dedication to strengthening economic bonds. The partnership between India and Africa could potentially impact a third of the world's population, driving global economic and social progress. This collaboration spans various sectors, reflecting the deepening economic connections between the two regions.

Global issues like climate shifts, food shortages, and clean energy needs, make India-Africa teamwork in space tech vital. By joining forces and using their unique skills, both sides can boost teamwork and build a better tomorrow for all. This partnership aims to create a world that's fair, rich, and open to everyone. Africa's economic strides and India's growing global role make their space teamwork a key driver of South-South ties. Space projects can boost both regions' world standing. Working together in space helps fulfil their cosmic dreams and builds global peace. It strengthens their bond while tackling big challenges across both lands.

This partnership shows how different parts of the world can join hands to reach for the stars and solve earthly problems.

Africa's space sector is rapidly advancing, with the establishment of the African Space Agency and increased satellite investments. This progress aligns well with India's established space capabilities. Both regions bring unique strengths to the table - India's expertise in satellite manufacturing and launch services complements Africa's innovative space applications and growing infrastructure.

India and Africa continue to strengthen their bonds, with space cooperation playing a key role. During its G20 leadership, India championed the inclusion of the African Union as a permanent G20 member. This move reflects India's commitment to broadening global discussions and ensuring developing regions have a stronger voice in international forums. It's a step towards more balanced and inclusive world dialogues, where diverse perspectives shape important global decisions.

At the 15th BRICS Summit in Johannesburg, South Africa, Indian Prime Minister Narendra Modi made a significant proposal: "We are already working on the BRICS satellite constellation, but to move a step further, we should think about establishing a BRICS space exploration consortium." India demonstrates its capability to lead independent and innovative space projects. India's decision is dictated by the terms of a more equitable and cooperative environment. For Africa, this presents an opportunity to collaborate with a neutral, influential partner in shaping the future of its space economy.

India and Africa: Driving Collaborative Measures in Space Sector

India has forged several strategic partnerships with African nations in space, focusing on satellite technology, Earth observation, and capacity building. These collaborations highlight the growing synergy between India and the countries of Africa in leveraging space technology for mutual benefit and addressing pressing global challenges.

[1] https://www.orfonline.org/expert-speak/time-for-a-new-chapter-in-india-africa-relations
[2] https://www.outlookbusiness.com/economy-and-policy/india-sets-200-billion-expansion-target-in-ecommerce-exports-by-2030#:~:text=India%20Sets%20%24200%20Billion%20Expansion%20Target%20in%20Ecommerce%20Exports%20by%202030,-India%20aims%20to&text=Commerce%20Secretary%20Sunil%20Barthwal%20said,to%20%24200%20billion%20by%202030.
[3] https://raisinahouse.org/africa-rising/f/examining-the-impact-of-indian-investments-in-africa#:~:text=In%20the%20last%20few%20years,amount%20of%20investments%20from%20India.

- In June 2024, India and Kenya announced a strategic alliance to expand Africa's space capabilities to monitor and predict extreme weather events in response to climate change. This partnership, showcased at the Kenya Space Expo & Conference held on June 18-20 2024, includes plans to build geospatial information networks and establish an Earth Observation Centre and an International Training Centre for Space Education in Kenya.

- India's maiden human spaceflight, 'Gaganyaan,' is currently in progress, with India also exploring collaboration opportunities with South Africa in this domain.[4] This builds on the existing MoU signed on 26 July 2018, which focuses on potential areas of cooperation, including space applications like earth remote sensing, satellite communication, satellite-based navigation, space science and planetary exploration, spacecraft and ground systems, and the application of space technology.[5]

- The Space Cooperation Agreement signed between ISRO and Algeria's Space Agency (ASAL) on September 19, 2018, focuses on areas such as crop forecasting application using satellite imagery; methodology for solar energy assessment; Bhuvan platform for Algeria; and disaster management systems.[6] This agreement, effective since its ratification, builds on previous collaborations, including the launch of Algerian satellites by India in 2016.

- India and Nigeria formalised their partnership on August 13, 2020, through a Memorandum of Understanding (MoU) aimed at enhancing space cooperation for peaceful purposes. This MoU covers satellite technology, ground stations, and research, supporting Nigeria in sectors like agriculture and connectivity, and builds on a history of collaboration involving the training of Nigerian nationals in India.

- Discussions between India and Ethiopia, which began in October 2017, explored potential space cooperation to support Ethiopia's ambitions of developing its own space launch vehicle and satellites for national security and disaster management.

- Additionally, India and Morocco signed MoUs on September 25, 2018, focusing on space cooperation and cybersecurity, reflecting a broader Strategic Partnership that includes defence and economic collaboration.

These initiatives underscore the importance of space technology in addressing socio-economic and environmental challenges in Africa.

India and Africa's other collaborations

India-Africa Science and Technology Partnership: The India-Africa Science and Technology Partnership promotes joint research and technological advancements between the two regions. It includes collaborative projects, technology transfer, and the establishment of research centres in fields like space science and biotechnology, aimed at enhancing scientific and technological capabilities in Africa.

PAN Africa eNetwork Project by TCIL : The Pan Africa eNetwork Project, initiated by Telecommunications Consultants India Limited (TCIL) in 2004, connects 53 African nations through a hybrid fiber optic and satellite network. It provides tele-education from 7 Indian and 5 African universities and telemedicine from 12 Indian and 5 African hospitals. Extended due to its success, the project includes the e-VidyaBharti and e-ArogyaBharti phases, offering free tele-education and medical training.

Indian Technical and Economic Cooperation (ITEC) Programme: The Indian Technical and Economic Cooperation (ITEC) Programme offers training and capacity-building for African professionals in governance, technology, and management. This initiative has equipped thousands of individuals with skills essential for their countries' development.

India-Africa Project Partnership Fund: The India-Africa Project Partnership Fund supports development projects in infrastructure, health, education, and agriculture. It provides crucial funding for road construction, water supply, and educational institutions, advancing sustainable growth across Africa.

[4]https://theprint.in/world/india-ready-to-partner-with-south-africa-in-space-exploration-says-consul-general-mahesh-kumar/1337512/
[5]https://www.pmindia.gov.in/en/news_updates/cabinet-approves-mou-between-india-and-south-africa-on-cooperation-in-the-exploration-and-uses-of-outer-space-for-peaceful-purposes/
[6]https://www.indianembassyalgiers.gov.in/page/india-algeria-relations/#:~:text=Bilateral%20Agreements&text=(iii)%20Space%20Cooperation%20Agreement%20signed,th%20September%202018%20at%20Bangalore.

Defence Cooperation : India has enhanced defence cooperation with Africa through various initiatives, including signing MoUs with Indian Ocean Rim nations, hosting India-Africa Defence Dialogues, and launching the Trilateral Maritime Exercise with Tanzania and Mozambique in 2022 to strengthen maritime collaboration.

Africa-India Agriculture Innovation Network: The Africa-India Agriculture Innovation Network boosts agricultural productivity and food security in Africa. It involves sharing agricultural technologies, building farmer capacities, and developing climate-resilient crops to support sustainable food systems

India-Africa Health Sciences Platform (IAHSP): The India-Africa Health Sciences Platform enhances healthcare capacity in Africa through strategic partnerships. It provides medical equipment, training programs, and infrastructure support, significantly improving healthcare access and quality in countries like Kenya and Tanzania.

Indian Solar Energy Initiatives: India's solar energy initiatives focus on expanding renewable energy across Africa.[7] Notable initiatives include the SolarX Grand Challenge[8] and OSOWOG launched by the ISA, along with other efforts aimed at reducing fossil fuel dependence across more than 35 African countries.[9] Projects in Rwanda and Ethiopia aim to increase solar capacity, promoting sustainable energy solutions and improving energy access across the continent.

India, an ideal strategic partner for Africa's Space Sector Transformation

India's significant advancements in space technology, driven by ISRO's pioneering efforts and a rapidly growing private sector, underscore its position as a formidable global player. The country's ambitious targets for economic growth, technological innovation, and international collaboration position it as an ideal strategic partner for Africa. India's space sector transformation, including the expansion of satellite manufacturing, launch services, and space applications, aligns with Africa's growing space ambitions.

India space capabilities and reforms

Like every other country, India's space sector has also undergone a significant transformation in recent years, evolving from a government- space agency led activity to a vibrant ecosystem with active private-sector participation. The market growth has been substantial, with the Indian space economy expected to grow at 16% CAGR to reach $44 bn. This growth is driven by advancements in satellite technology, launch capabilities, and space applications, particularly in areas like Earth observation, telecommunications, and navigation.

The private sector in India has become a key player in this transformation, with numerous start-ups and MSMEs (Micro, Small, and Medium Enterprises) contributing to the development of innovative space technologies. Several start-ups are leading the charge in areas such as small satellite launches, hyperspectral imaging, and space exploration. The government's recent policy reforms, including the opening up of the space sector to private players and the establishment of the Indian National Space Promotion and Authorisation Center (IN-SPACe), have further accelerated this growth. India is mirroring the trajectory of paving the way for its own SpaceX or Blue Origin in the near future, where many private players are leading the charge to commercialise India's space sector and bolster its status as a space pioneer.

Prime Minister Narendra Modi has emphasised the need for bold reforms to make India self-reliant in space technology. His vision includes leveraging the private sector's potential to drive innovation and growth in the space sector. The Prime Minister's call for a self-reliant India (Aatma Nirbhar Bharat) underscores the importance of creating a conducive environment for private companies to thrive and contribute to national development.

Potential collaboration between India-Africa

India can partner with Africa in achieving the goals of STISA 2024[10] (Science, Technology, and Innovation Strategy) as part of African Union's agenda 2063,[11] in which space is the key driver, by supporting and strengthening the space economy. This collaboration can drive an increase in per capita income and GDP, while addressing Africa's

[7] https://apnews.com/article/solar-energy-india-seed-fund-africa-climate-change-renewables-cop28-3d757a463ad39eda71d4186cf8a24faf# [8] https://www.investindia.gov.in/team-india-blogs/solar-energy-african-connect#:~:text=African%20nations%20have%20shown%20great,an%20emerging%20sector%20in%20Africa. [9] https://www.wider.unu.edu/publication/india%E2%80%99s-development-cooperation-africa
[10] https://au.int/en/documents/20200625/science-technology-and-innovation-strategy-africa-2024
[11] https://au.int/en/agenda2063/overview

socioeconomic development needs and building a knowledge-based economy to improve the continent's global competitiveness.

The African Space Policy,[12] a major driver of Agenda 2063, aims to address critical goals such as climate change, environmental management, rightful ownership of space and ocean resources, and promoting development, empowerment, and employment. It focuses on integration, infrastructure, resource management, knowledge banking, innovation, and safety. The strategy includes creating a regulatory framework for a responsible space program, leveraging space-derived products for decision-making, and fostering indigenous space capabilities in both the private and public sectors. India can contribute to these goals by facilitating joint ventures, offering training programs, sharing technological expertise and resources, and investing in infrastructure development.

India and African nations can collaborate to advance the development of indigenous space technologies and services, fostering African-led innovation in space-derived solutions. This partnership can support African initiatives addressing key challenges such as poverty reduction, disaster risk management, agricultural enhancement, transportation improvement, and sustainable development. By working together, both India and African countries can contribute their unique strengths to create space-based applications tailored to Africa's specific needs and priorities, ensuring local ownership and implementation of these critical solutions.

Space as Driver of Agenda 2063

The African Space Policy also stresses intra-continental cooperation, promoting regional collaboration to develop a space industry that meets African market needs. India's involvement can facilitate this by fostering public-private partnerships that align with both Africa's and India's objectives. Moreover, Africa's policy integrates gender equity and youth involvement, similar to India's focus, promoting inclusive growth in the space sector.

A key factor in ensuring the success of the India-Africa partnership lies in adopting an **incremental development approach** mentioned in the STISA.

This involves focusing first on foundational capabilities, then scaling up based on capacity. This proven strategy, which has guided India's space sector evolution, ensures that the partnership remains feasible, sustainable, and scalable over time. As both regions build a future centered on space-based solutions, collaboration between India and Africa can unlock new opportunities for growth, innovation, and technological advancement. India's growing space sector is not only a testament to its ambition but also a valuable resource that can help Africa achieve its goals of space-enabled development and economic transformation.

Additionally, investing in human capital is essential for a thriving space sector. India's first overseas IIT campus in Tanzania aims to strengthen technical education.[13] Over the years, Indian private companies have actively invested in cutting-edge technologies to foster growth across African nations,[14] collaborative initiatives like the Pan African University Space Science Institute in Nigeria could greatly benefit from India's educational methodologies and research practices. Expanding joint training programs, R&D programs and student exchange initiatives—such as those previously organized by ISRO for 33 various countries—to include African countries would help develop a skilled workforce. India has already contributed significantly to Africa's digital and technical education, supporting IT education in Kenya,and Botswana, and providing high-end computers to Ghana, Tanzania, and Uganda. These efforts, coupled with grants and lines of credit,

[12] https://www.unoosa.org/documents/pdf/psa/activities/2019/UNChinaSymSDGs/Presentations/SALEY_African-Space-Policy-and-Strategy.pdf
13 https://www.financialexpress.com/business/defence-bridging-continents-indias-first-foreign-iit-campus-in-tanzania-to-empower-education-and-foster-african-development-3151702/
14 https://www.thehindu.com/business/Industry/reliance-jio-arm-tech-mahindra-bag-orders-from-ghana-for-building-4g-5g-telecom-infrastructure/article68221385.ece

demonstrate India's commitment to empowering Africa's technological and educational growth.

Strengthening regional coordination in Africa can optimise resource use and avoid duplication of efforts. India's experience in regional space collaborations, such as its support for South Asian nations through the South Asia Satellite initiative, could be extended to Africa. Strategic partnerships could involve joint development of technologies like the Astrosat, India's first dedicated multi-wavelength space observatory, which could be adapted for use in African space programs to enhance regional capabilities in space research and monitoring. The G20 satellite further presents an opportunity for all the G20 members including Africa to contribute payloads for weather and climate observation, ensuring global data accessibility for use in weather modelling and scientific research.[15]

Another important segment is bridging digital divide

Africa stands at the cusp of a digital revolution, with immense potential to leverage satellite technology for widespread connectivity. The continent's unique geography and diverse population distribution present an opportunity to leapfrog traditional infrastructure challenges through innovative satellite communications.

Africa, much like India, faces a significant digital divide with internet penetration rates lowest in rural and hard-to-connect areas. Despite steady progress, Africa's broadband internet access in 2022, is less than 40% across the continent. India, faced with similar challenges has prioritized bridging its own digital divide through initiatives like BharatNet, one of the largest rural telecom projects globally.Initially reliant on optical fiber cable (OFC), BharatNet mission faced challenges in meeting its targets.

The Indian government has since incorporatedgsat satellite technology into its strategy, offering a more effective solution for connecting remote and underserved areas.

India's advancements in satellite communications, combined with its comprehensive policy roadmap, provide valuable insights for Africa. By integrating satellite-based ICT solutions, Africa can effectively address its own connectivity gaps, particularly in rural and landlocked regions. This would enhance public services, governance, and critical sectors such as healthcare, education, and agriculture.

The rapid adoption of mobile internet across Africa highlights the continent's readiness to embrace new technologies. Building on this foundation, satellite-based broadband can further accelerate digital growth, empowering communities and driving socio-economic development across Africa.

Satellite technology offers a promising solution to rapidly expand internet access across Africa, particularly in rural and landlocked areas. By embracing this technology, African nations can:

- Accelerate digital inclusion, bringing millions of people online and unlocking economic opportunities.
- Enhance public services through e-governance initiatives, improving efficiency and accessibility.
- Boost critical sectors such as education, healthcare, and agriculture through satellite-enabled applications.
- Foster regional integration and cross-border collaboration through improved connectivity.

The partnership between African nations and countries with advanced satellite capabilities, such as India, can catalyse this digital transformation. By combining Africa's growing tech ecosystem with cutting-edge satellite technology, the continent can create tailored solutions that address its specific needs and aspirations.

As broadband infrastructure continues to expand, satellite communication can complement these efforts, ensuring comprehensive coverage and bridging remaining gaps. The rapid adoption of mobile internet across Africa demonstrates the continent's readiness to embrace new technologies. Building on this foundation, satellite-based broadband can further accelerate digital growth, empowering communities and driving socio-economic development across the continent.

The rising global and domestic demand for satellite data and space technology is evident across sectors such as Infrastructure Development, the National Infrastructure Pipeline (NIP), the National Hydrology

[15] https://www.thehindu.com/news/national/india-proposes-g-20-satellite-for-climate-observation/article67289618.ece

Project (NHP), the Gati Shakti National Master Plan, the SVAMITVA scheme, and the AMRUT Smart Cities Mission. These applications demonstrate how space-based data drives innovation and supports India's developmental goals.

India's GSAT-20, a cutting-edge communications satellite developed by ISRO, will launch this year to provide high-speed broadband internet across hard-to-reach regions. With a throughput capacity of 48 Gbps, it will significantly enhance connectivity and support initiatives like the Smart Cities Mission and broader digital development goals. Similarly, Africa could improve its communication infrastructure by developing its own satellites, ground stations, and data centers, aligning with the African Space Policy and Strategy through partnerships with India.

Africa could enhance its communication infrastructure by establishing its own satellites, ground stations, and data centers.

This aligns with the African Space Policy and Strategy's focus on improving space infrastructure through collaborations with India. Space applications are crucial for achieving over 90% of the strategic objectives across the eight departments of the African Union Commission (AUC). Leveraging space-based products and services to provide critical spatial data will be instrumental in driving progress toward the Sustainable Development Goals (SDGs), just as they would have for the Millennium Development Goals (MDGs).

Africa's diverse nations are poised to harness the transformative power of space technologies, tailoring applications to their unique geographical and economic landscapes. From the vast Sahara to lush rainforests, from coastal regions to landlocked countries, satellite-enabled solutions offer immense potential across various sectors.In education, VSAT terminals can connect remote desert schools in Algeria and Sudan to urban centers, while forest-rich nations like the Democratic Republic of Congo can provide continuous learning in isolated communities. Healthcare delivery can be revolutionised through telemedicine, allowing mountainous countries like Ethiopia and Rwanda to link remote clinics with city specialists, and enabling Sahel nations to respond swiftly to disease outbreaks. Agricultural productivity can be enhanced through Earth observation data, benefiting breadbasket nations like Kenya and Zimbabwe with precision farming techniques, while Saharan countries can better manage water resources and predict droughts.

Moreover, space applications can drive sustainable development across the continent. Mineral-rich countries such as South Africa and Botswana can optimise mining operations using satellite imagery, while forested nations like Cameroon, Congo and Ghana can monitor and prevent deforestation. Coastal countries can leverage satellite data for responsible offshore resource exploration and marine conservation. In disaster management, cyclone-prone nations like Madagascar and Mozambique can implement early warning systems, while countries along the Great Rift Valley can monitor seismic activity. Urban planners in rapidly growing cities across Nigeria and Ethiopia can use high-resolution satellite imagery for efficient development, and major infrastructure projects can benefit from optimised planning and monitoring. By embracing these space-based solutions, African nations can address their specific challenges, foster pan-African collaboration, and position themselves as significant players in the global space economy, driving progress from the Sahara to the southern tip of the continent.

India's Space Industry Market Overview

The Indian space economy is currently valued at around ₹6,700 crore ($8.4 billion), holding a 2% share of the global space economy. The domestic market share stands at ₹6,400 crore ($8.1 billion), while exports account for ₹2,400 crore ($0.3 billion).

According to IN-SPACe's decadal vision projections, India's space economy has the potential to reach ₹35,200 crore ($44 billion) by 2033, achieving about an 8% share of the global market. The goal is to increase the domestic share to ₹26,400 crore ($33 billion) and the export share to ₹88,000 crore ($11 billion), supported by an envisioned investment of ₹17,600 crore ($22 billion) over the next decade.

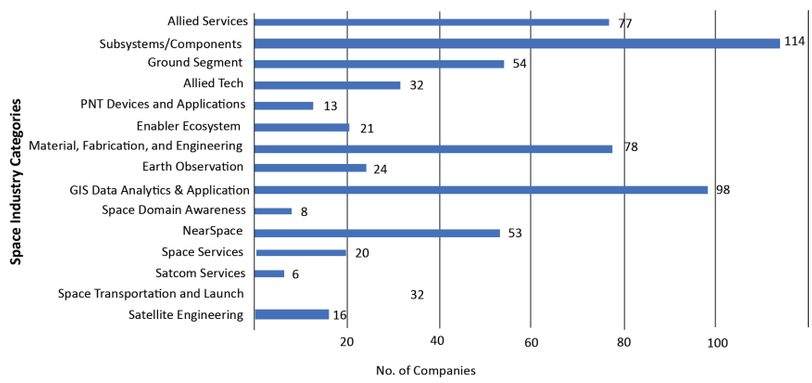
India's space sector is governed by a dynamic and forward-looking policy framework that aims to stimulate growth and attract international collaboration. The Indian Space Policy 2023 emphasises the role of private and foreign entities in space activities, fostering an environment conducive to innovation and investment.

The policy encourages partnerships in satellite manufacturing, launch services, and space applications. A significant highlight is the liberalisation of foreign direct investment (FDI) regulations, allowing up to 100% FDI through the automatic route in satellite components and ground systems, and up to 74% in satellite manufacturing and operations. Additionally, the Indian government supports global partnerships through strategic space cooperation agreements, facilitating joint ventures and knowledge exchange. These measures collectively position India as an attractive destination for international space collaborations, aligning with global trends and addressing shared challenges in space technology and applications.

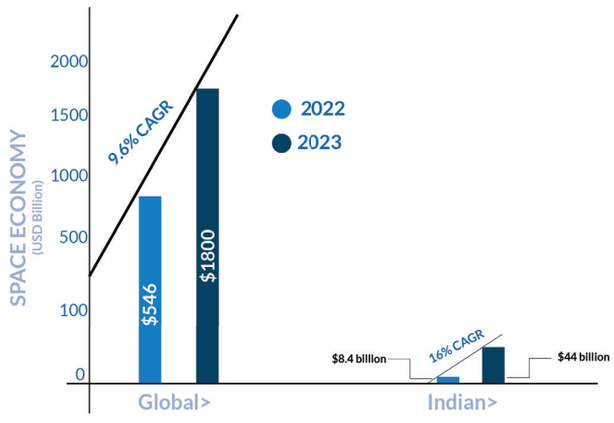
Over the past five decades, ISRO has successfully developed an indigenous end-to-end capability in space technology and activities. This achievement has fostered the growth of Indian industries, with over 500 MSMEs, PSUs, and large private companies significantly contributing to the space programme, creating jobs for approximately 45,000 people across the country. Currently, India is home to more than 200 space startups.[16]

In 2023, India's space startups received $123.90 million in funding, bringing the total to $380 million. Significant milestones include the launch of India's first privately developed rocket, capable of multi-orbit and interplanetary missions, and a mission featuring the world's first single-piece 3D-printed semi-cryogenic rocket engine. These achievements have significantly strengthened investor trust in the Indian market. Additionally, the partial survey mapping of Indian space tech companies depicted in the figure below, provides a clearer understanding of the Indian market;

SIA-India Partial Mapping of India's Space Tech Companies by Verticals (2024)



India's Space Industry Market Overview



Space sector ambition for India across domain

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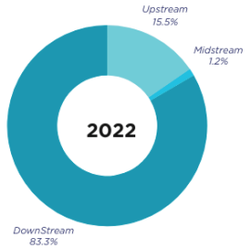
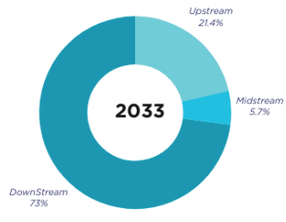


USD-8 Billion (2% of global market share)



USD-44 Billion (8% of global market share)

16 https://www.isro.gov.in/UNLOCKING.html

Satellite Launch capabilities

India's satellite launch capabilities have evolved remarkably, establishing the country as a key player in the global space launch market. Led by ISRO, India's launch vehicle program is renowned for its cost-effectiveness and reliability. ISRO has launched over 400 satellites since its inception, with a strong track record of successful missions .

The Polar Satellite Launch Vehicle (PSLV) is particularly noteworthy, having gained international acclaim for its versatility and impressive success rate. It has successfully deployed over 300 foreign satellites for 30 countries, including a record 104 satellites in a single launch in 2017 . This positions India strategically in a market projected to see over 1,000 satellite launches annually by 2027 .

The Geosynchronous Satellite Launch Vehicle (GSLV) enhances India's capabilities for launching heavier payloads, supporting a range of applications including communication and disaster management. With payload capacities of up to 4,000 kg, the GSLV plays a crucial role in advancing India's space infrastructure .

The newly introduced Small Satellite Launch Vehicle (SSLV) meets the growing demand for rapid and flexible launch options. Designed for quick turnaround times, it can deploy payloads of up to 500 kg into low Earth orbit (LEO) within 72 hours of receiving a satellite. This vehicle positions India well in a market projected to grow by 20% annually .

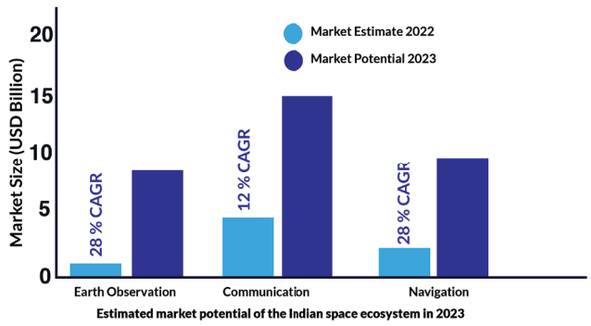
India's satellite launch market is estimated to reach $3.5 billion by 2033, up from approximately $720 million in 2022 . This growth is fueled by the affordability of India's launch options, particularly the PSLV, which costs between $21-31 million per launch, significantly below the global average of around $50 million . The SSLV, priced at about $3.7 million per launch, offers additional cost-effective options .

Private enterprises are revolutionizing India's launch landscape by leveraging advanced technologies to reduce costs and enhance accessibility, potentially increasing the country's share of the global launch market from 2% to 8% by 2030 .

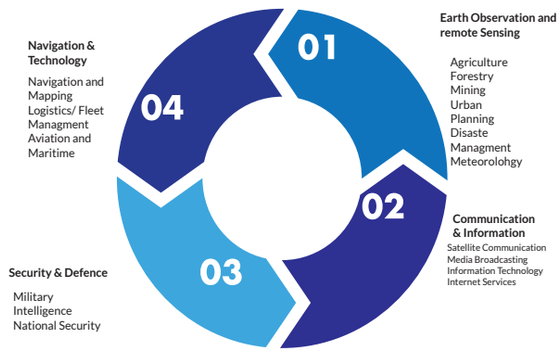
With 77 government space agencies worldwide and only 16 with launch capabilities, India stands out by offering affordable satellite launch solutions, particularly through the SSLV. ISRO's ability to provide launches at up to 50% lower costs than competitors makes it an attractive partner for developing nations .

The future of India's launch capabilities looks promising, supported by initiatives aimed at developing green fuel solutions and facilitating human space missions. Planned investments of approximately ₹17,600 crore ($2.1 billion) over the next decade will enhance India's space infrastructure and capabilities .

Satellite Capabilities for Communication, EO and PNT



Estimated market potential of the Indian space ecosystem in 2023



Communication Satellites: The INSAT and GSAT series are pivotal for telecommunication, broadcasting, meteorology, and emergency communication, expanding broadband access and connectivity in remote areas. The India Satellite Communication Market size is expected to reach USD 5.80 billion by 2029.[17]

Earth Observation Satellites: The IRS, Cartosat, Resourcesat, and RISAT series provide critical data for resource management, urban planning, agriculture, and disaster management. The geospatial market's growth, projected to reach approximately ₹63,000 crore by 2025, underscores the importance of these

17 https://www.mordorintelligence.com/industry-reports/india-satellite-communication-market

capabilities.[18]

Navigation Satellites: NavIC enhances navigation accuracy for various sectors including transportation, logistics, and precision agriculture. The introduction of the Satellite-Based Toll Collection System exemplifies its impact on improving traffic management and operational efficiency.

Scientific and Exploration Satellites: India's missions, including Chandrayaan, Mangalyaan, Aditya L1, XPoSat, and Astrosat, showcase advancements in lunar, Martian, solar, and celestial studies, highlighting India's role in space science and technology.

India's Space Leadership: Regional Partnerships and Private Sector Impact

India as a founding member of the South Asian Association of Regional Cooperation (SAARC) has authorised SAARC nations to use its NAVIC regional positioning system. Three international stations in Brunei, Indonesia, and Mauritius are served by the ISRO Telemetry, Monitoring and Command Network (ISTRAC). As a member of the International COSPAS-SARSAT program, India provides satellite-aided search and rescue services to Bangladesh, Bhutan, Maldives, Nepal, Seychelles, Sri Lanka and Tanzania.

As a core component of India's foreign policy, 'neighbourhood first' policy focuses on peaceful relations and collaborative synergetic co-development with its South Asian neighbours in economic, technology, research and education, connectivity (digital, surface and air transport, energy grid connectivity, logistic 6chains, etc), space program, defence-security, environment and climate challenge etc. SAARC satellite is aligned with India's neighbourhood first policy to support communication, broadcasting and Internet services, disaster management, telemedicine, tele-education, and weather forecasting in the entire South Asian region. Looking ahead, African nations are poised to benefit from international space initiatives and India's diplomatic networks.

The success of Chandrayaan-3 can be largely attributed to the private sector, which contributed around 80% of the mission's efforts. This collaboration has established the private sector as a key player in advancing space initiatives. The upcoming projects such as Gaganyaan, NISAR, Chandrayaan-4, the Indian Space Station (Bharatiya Antariksha Station), and AstroSat-2 are set to further increase private sector involvement. The Indian government has earmarked $2.7 billion to boost private participation in ISRO's missions, including $2.7 billion for Chandrayaan-4, $1.3 billion for the Gaganyaan crewed mission, $985 million for the Next-Generation Launch Vehicle, and $150 million for the Venus Orbiter Mission.[19]

Beyond investment and industrial-scale development, the private sector is driving disruptive innovations and accelerating progress through innovative business models. The rampant increase in private sector engagement in India opens doors for African startups and companies to collaborate inadvancing space technologies.

In alignment with Africa's development and sustainable action goals, India is ideally positioned to foster partnerships that advance mutual growth and technological innovation in the space sector.

Conclusion

The strategies outlined here mark the beginning of dynamic collaborations between India and the diverse countries of Africa in the space sector. These partnerships promise to unlock unique opportunities tailored to each country's specific needs, from enhancing Earth observation in forest-rich regions to developing telemedicine solutions for remote desert communities. By respecting the distinct identities and priorities of each nation, these alliances can leverage individual strengths to drive progress and foster economic growth across both India and the African continent.This approach to collaboration sets a new standard for international space cooperation, recognising the sovereignty and potential of each participating country.As these relationships evolve, they pave the way for a future where space technology benefits are accessible to all, regardless of geographical or economic boundaries. The prospect of groundbreaking discoveries and life-changing applications grows ever more promising, exemplifying a truly global scale of respectful, mutually beneficial innovation.

18 https://www.newindianexpress.com/web-only/2023/Dec/28/indias-national-geospatial-policy-analysing-progress-and-charting-the-future-2645728.html#:~:text=The%20policy's%20people%2Dcentric%20and,USD%20206.93%20billion%20in%202030.

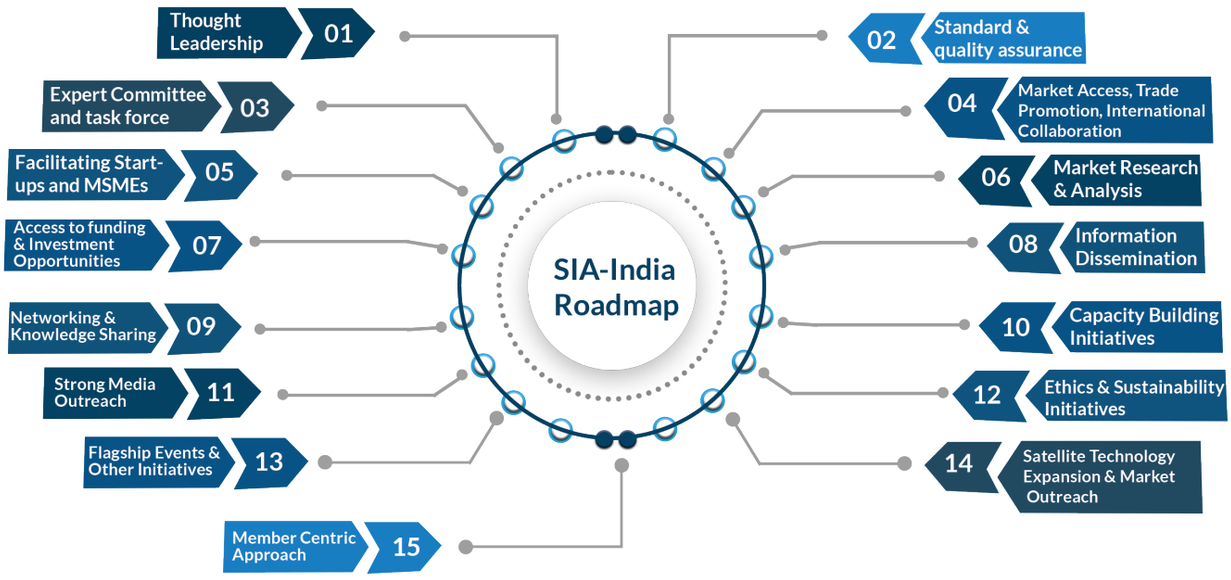
19 https://timesofindia.indiatimes.com/etimes/trending/cabinet-approves-funds-for-four-major-space-missions-details-inside/articleshow/113556955.cms

About SIA-India

SIA-India, a dynamic, not-for-profit space sector association, SIA-India is dedicated to advancing sectoral interests, accelerating industry growth, and catalysing innovation through strategic engagements with key governmental and global stakeholders, policymakers, regulatory bodies, and standardisation entities, aiming to create a vibrant and innovative ecosystem within the space.

SIA-India 15-point program

The SIA-India 15 Point Program is a comprehensive strategy designed to advance the Indian space industry by focusing on innovation, collaboration, and growth. It emphasises fostering partnerships, enhancing technological capabilities, and expanding market access for Indian space enterprises. Through targeted initiatives and supportive policies, the program aims to facilitate b2b collaborations and position India as a global leader in space technology and exploration.



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