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INDIA'S SPACE LEADERSHIP IN THIRD WORLD: TODAY AND BEYOND

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ABSTRACT

Compared to the traditional space powers of the West, India opted for the civilian dimension rather than the military dimension of space possibilities and capabilities. With this approach, the Indian Space Research Organization has made its mark among the world's top ten space agencies. India's space success rate is second only to China among developing countries. However, one fact that establishes India to the forefront is a space program dedicated to transparent, accountable and socio-economic development. On the model of which India is working for the betterment of the global society and the nation by establishing continuous contact of space services with the third world by combining space science and technology for development. Continuity of these efforts encourages India to lead the third world by laying the foundation of a new international technological order as a space alternative. This article mainly analyzes the Indian space program as a Third World leadership role with the help of secondary sources and qualitative data and reinforces the practicality of leadership by providing a roadmap for future initiatives.

KEYWORDS : *Space Programme, Space leadership, Third World, New International Technology Order*

INTRODUCTION

India's rise as the world's leading space-aspiring nation began with the creation of the Indian National Committee for Space Research (INCOSPAR) on February 23, 1962, through a government initiative. As its successor, the Government of India formally established the Indian Space Research Organization (ISRO) in 1969. In the chronology of India, the infrastructural development of the nation and the socio-economic development of the citizens was the main challenge in front of the independent India from colonial rule. Taking that into consideration, Dr. Vikram Sarabhai laid the foundation of India's space program with the conviction that India can 'leapfrog' over decades of scientific and industrial backwardness by using the tools of the latest advances in space science and technology, particularly in areas like communication, education, health, planning, disaster management and optimal resource utilization by remote sensing techniques (Aravamudan, 2020). However, this approach also generated criticism for India both domestically and internationally because of the nation's limited financial resources and the apprehensive success and hazy future of the space industry. Despite this, India has advanced in its pursuit of space science and technology and is currently building all types of remote sensing and communication satellites indigenously. On February 15, 2017, ISRO created a unique record by jointly launching 104 satellites (101 foreign) through its horsepower Polar Satellite Launch Vehicle (PSLV). (Johnson & Sinha, 2017) In addition, India became the first country to successfully execute two deep space missions beyond Earth's orbit - Chandrayaan-1 (2008) and Mars Orbiter Mission (2014) in its maiden attempt.

According to the Space Competitiveness Index released in 2014 by the Furton agency, India ranks 6th in the global space sector on the basis of three combined dimensions – government, capital, human and industry dimensions (Furton, 2015 & Radhakrishnan, 2014). However, as per Dinshaw Mistry, it was only after the first flight of GSLV in 2001 that India emerged from the developmental phase of its space program and joined the ranks of the world's five most advanced space agencies through the development of GEO capability (Mistry, 2001). Today, India has developed its own model for national development through space, which includes the pride of building indigenous space capability, international prestige with high technology achievement, regional leadership and balancing national security with external insecurity. And other space faring nations like South Africa and Kazakhstan can balance India's internal and external experience with their space programme (Christensen, et al., 2009). That is, by achieving international recognition and high status in the space sector, India is providing non-western Indian space alternative equivalent to the third world. Under which India's steps and initiatives to reach the countries of Asia, Africa and Latin America are strengthening India's claim of space leadership in the third world. And in future steps, India is expected to give birth to a 'New International Technology Order' for the third world.

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THIRD WORLD AND THE NEW INTERNATIONAL TECHNOLOGYICAL ORDER (NITO)

The term Third World was used by Alfred Sauvy in 1952 to refer to the Third Estate or the common people before the French Revolution. Which is mainly marginalized politically, economically and socially. Over time, this concept emerged in the form of post-colonial states after the Second World War, then in the ideological world of the Cold War, as a third block apart from the capitalist and communist blocks, and finally through the Non-Aligned Movement. (Thomas,1999) India became the main founder and flag-bearer leader of this non-aligned movement. It has fueled the idea and debate of a new international economic order since the early 1970s through the efforts of the Non-Aligned Movement conferences and the Group of 77. The developing nations along with India involved in both the forums implemented mutual cooperation in contrast to the exploitative and unequal policies of the developed nations in the international economy to make the international economy equal and optimized. As a result of which the "Declaration and Program of Action on the Establishment of a New International Economic Order" was formally adopted at the Sixth Special Session of the United Nations General Assembly in May 1974 (Murray, 1982).

Equivalent to this, India can give rise to the international technology order parallel to the international economic system in terms of the relevance of forums like the New Non-Aligned Movement and G-77. Because the space program of developing countries is divided into three tiers (categories) based on their success and advancement and India is included in the first tier along with China and Brazil. The first tier countries have the production capacity of space technology through autonomous efforts and are equipped with indigenous launch systems. In the second category, countries like South Africa, Israel, Iran were included whose national space agencies are giving direction to their space program by establishing cooperation with advanced space agencies. However, they have limited or sounding rocket launching facilities available. The third tier includes developing countries in Africa, Asia, and Latin America that have some form of dependence on foreign space powers for their space requirements (Harding, 2016, pp. 78–79). India's idea of a new international technology order pertains to the third tier of nations, who are aware that access to space encourages earth development. An example of which is the African Union's adoption of Africa's first space policy in 2016 and Africa's outer space program to be part of the long-term framework of Agenda 2063: The Africa we want (Offiong, 2022). That's why India should establish NITO, In which standards should be set by India itself with its indigenous space capability and efforts by making a helping hand in front of third world countries. The basis of which should be the social and economic development dimension in the form of the Indian space model. The vision of the Indian leadership in this new international technology order should include the following goals:

- Promote Techno-diplomacy (Space-diplomacy) in achieving national goals.
- Keep the option of space commercialism open at the bilateral relations.
- Promote space initiatives at multilateral level and fora.
- Promote Technocracy for socio-economic development.
- Promote Techno-globalization in South-South cooperation.
- Promote space as a common asset and benefits for all.
- Also make space a part of its soft power matrix to connect with the world easily.

After all, why should India try for a new international technology system from its perspective?

- To counter and control China's space leadership expansion.
- For expansion of the Indian space industry and contribution to GDP.
- To become the non-Western alternative in space technology.
- To mature the grouping at the regional and global level.
- To increase the number of its scientific goodwill ambassadors in the world.
- Take SDG Goal 17 - 'Global Partnership for Sustainable Development' as a space technology service extension.

HISTORY OF INDIA'S SPACE INITIATIVES IN THIRD WORLD NATIONS

Since the early 1970s, India began to share and promote its growing technological know-how and experiences with third world countries. All these efforts include government to government, organization to organization, institute to institute and student to student contact and relationship i.e. from first track to second track diplomacy. Which has access to South Asia, South-East Asia, Central Asia, Africa, Latin America and developing European countries. The following list of well-liked initiatives is discussed:

- **Indian Technical and Economic Corporation (ITEC) Program** - It was established on September 15, 1964, on the basis of bilateral relations and cooperation, to share the lessons of India's social, economic, political, technological

development with the developing countries which India has been imbibing. Today, more than 280 courses are being conducted under this program in 47 education and training institutes of India. In which two short courses for very basic knowledge of space - Remote Sensing and Geoinformatics are being organized by Indian Institute of Remote Sensing, Dehradun.Today the program is sharing Indian development experiences with over 160 partner countries that come from Asia and the Pacific, Africa, Latin America and the Caribbean, and Eastern and Central Europe ("50 Years of ITEC," 2014 & IIRS, Dehradun).

- **Experimental Satellite Communications Earth Station-** India established an Experimental Satellite Communications Earth Station (ESCES) at Ahmedabad in 1967 in the developmental phase of its space programme. Whose objective was to explore the potential of outer space and artificial satellites in the field of communication and broadcasting. And under which to act as a training center for international scientists and engineers mainly from developing countries along with Indians in satellite broadcasting. For this purpose, the Indian Space Research Organization also received financial assistance from the United Nations Development Fund and the International Telecommunication Union (Singh, 1988 & Chitnis, 2020).

- **SHARES Initiative -** In the meeting of the second United Nations conference on peaceful uses of outer space (UNISPACE-82) held in 1982, India put forward a proposal that India is ready to share its space technology and its application experience with developing nations.Which was implemented under the name SHARES - sharing its experience in space applications program. In the very beginning, more than 50 people from developing countries were helped to gain experience in Indian space centers. In the very beginning, more than 50 people from developing countries were helped to gain experience in Indian space centers (Kasturirangan et al., 2009). Under this, regular courses, being a part of space related programs or participating in selected missions, development and transfer of remote sensing equipment etc. are included. Free courses and training materials and tools were also provided to the participants. It is worth noting here that India is a democratic country and its space program is also dedicated to civilian capabilities, so it used to invite anyone to participate as an open platform.

- **Centre for Space Science and Technology Education in Asia and the Pacific-** CSSTEAP was established in 1995 by the United Nations Office for Outer Space Affairs, with India's Department of Space declared as the host and nodal agency. Today it includes seventeen member countries from the continent of Asia – India, Bangladesh, Sri Lanka, Nepal, Myanmar, Iran, Thailand, Philippines, Malaysia, Indonesia, Mongolia, North Korea, Kazakhstan, Uzbekistan and Nepal etc. It offers post-graduate education and training programs in remote sensing, communication and meteorological satellites, atmospheric sciences and navigation. For which Indian Institute of Remote Sensing (Dehradun), Space Applications Center and Physical Research Laboratory (Ahmedabad) and U.R. Rao Satellite Center (Bangalore) is responsible for the main academic program and training courses (Five Years PROGRESS REPORT, 2016 & CSSTEAP: A journey of 25 years, 2020).

- **Pan African e- network -** The project was conceived by the former President Honorable Dr. APJ Kalam in 2004 to operationalize Tele-Education Services and Tele-Medicine Services. It was launched in 2009 with an amount of ₹500 crore (US$125 million) with Ministry of External Affairs as the nodal ministry and Telecommunications Consultants India Limited (TCIL) as the implementing agency. The project aims was to establish satellite and fiber optical connectivity between 53 African nations and India. Over time, its services have expanded to include project e-governance, e-commerce, infotainment, resource mapping and meteorological services. For which, a part of the US$ 600 million grant made by India during the 3rd India-Africa Forum Summit in 2015 was also earmarked for the expansion of the Pan African e-Network (Mullen & Arora, 2016). The project was funded by India, whose services were discontinued by the Government of India in July, 2017 and handed over to the AU Commission (Mishra, 2018).

- **South Asia Satellite -** On May 5, 2017, ISRO launched the dedicated South Asia Satellite (GSAT-9) for communication and meteorology of South Asian countries from Satish Dhawan Space Centre, Sriharikota. After the successful flight, PM Ashraf Ghani of Afghanistan said, "South Asia today has taken a giant step towards regional integration... If cooperation through land is not possible, we can connected through space"(Annadurai, 2017). In fact, the idea of this satellite built and launched entirely by ISRO was mooted by Prime Minister Modi at the 18th SAARC summit held in Nepal and after its successful flight was declared as a 'priceless gift' to the neighbors.The satellite with 12 Ku band transponder is providing services like satellite DTH television, tele-education, tele-medicine and disaster management (Venkatasubramanian, 2017). Today all the members of SAARC are benefiting from it except Pakistan.

- **e- VidyaBharti and e-ArogyaBharti Network Project-** Both these initiatives are a modified expansion of the Pan African e-network in 2018 as the immense contribution of the old project led to its revival with new objectives.This 5-year program, which is abbreviated as e-VBAB, will be fully funded by India. Under which to provide higher education to 4000 students annually through tele-education services and to provide medical education to 1000 doctors and nurse staff annually through tele-medicine services (Saroha,2019).

- **UNNATI (UNISPACE NANO SATELLITE ASSEMBLY & TRAINING)-** India reiterated its international space cooperation pledge in June 2018, on the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50) in Vienna, as part of the new UNNATI Programme. Under which ISRO through its UR Rao Satellite Center (URSC) will provide training to space aspiring countries through a combination of theoretical courses on development of nano satellites and assembly, integration and testing (AIT) by 3 batches for 3 years. Reaching out to benefit 45 countries, the first batch started on January 17, 2019 with 30 participants from 17 countries in Asia, Africa, Latin America and Europe (UNNATI Introduction, 2022).

- **Space ground stations in ASEAN-** India and ASEAN also included the space sector in the Action Plan for 2010-2015. In which cooperation and capacity building in space technologies, from sharing satellite data for natural disasters to launching small satellites and scientific instruments, prepared a strategy. As a result of which India has successfully launched the satellites of Singapore, Indonesia, Malaysia. India is building a mega ground space station in Vietnam in a new nexus of space cooperation and relationship with the Association of South-East Asian Nations. The station is being built on four hectares of land at My Phuoc 3 Industrial Park in Binh Duong Province, Vietnam to provide remote sensing service to all 10 ASEAN countries. However, in 2015 itself, Prime Minister Narendra Modi presented its concept at the India-ASEAN meeting in Nay Pyi Taw, Myanmar (Kumar, 2021). Also such an effort was in 2018 to establish a telemetry, tracking and command (TT&C) station between Brunei and India for orbiting satellites and launch vehicles. The same first agreement is already between Indonesia and India, under which India is taking service from the ground station located in Biak, Indonesia (Sarma, 2019).

Among the well-liked projects in addition to all of these initiatives, India has space cooperation agreements with countries in Latin America, including Mexico, Argentina, Bolivia, Brazil, Chile, Peru and Colombia, which ISRO intends to expand. And ISRO foreign satellite launch club also includes Brazil (Amazonia-1), Mexico (Nano Connect-2), Chile (Suchai-1), Argentina (Pehuensat-1), Colombia (Facsat-1).

FUTURE ROADMAP FOR THE NITO

To lead the third world, India will have to concentrate on few key long-term initiatives to bring this new international technology order to the ground, including the following:

- Establishment of space wing at SAARC organization or BIMSTEC level.
- To organize regular ASEAN-India Space Dialogue.
- Creating an official African Union-India Space Services forum.
- Establishment of Central Asia-India Space Support and Training Centre.
- Working on the Latin America-India Space Dialogue Initiative.
- Promotion of differential launch rates for third world governments, universities and companies for satellite launch through PSLV.
- Separately promoting space tourism for students from third world countries.
- Indian private companies will have to be brought together for manufacturing small or nano satellites.
- Including a portion of its space budget as "Global Space Partnership for Capacity Building".

CONCLUSION

Based on the 2021-2022 Economic Survey of India report, India accounts for about 2 percent of the total global space economy of US$ 447 million (Economic Survey, 2022). And with this India is the seventh largest contributor to the global space economy (Space foundation, 2021). India can raise its global share by extending its more cost effective space programme to third world nations, but the execution is also difficult due to the need for sufficient financial resources, availability of more scientific and engineering personnel, China's expanding space programme, and other factors. Despite this, India will have to include the geopolitical landscape in its first under-construction space policy, particularly the future strategy and ambitions for the third world in the Indo-Pacific. Because this region is more disaster prone, abundance of resources, trade activity, sensitive to security, regional leadership and balance of power equation. Finally, the backing and alliance of peripheral countries are now more pivotal for nations aiming to global and regional influence due to the changing international scenario and structure. Therefore, the NITO approach of India, where on one hand it will work to bridge the development gap through space technology for the peripheral country, on the other side it will make India a choice of decisive role in international politics and economy.

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