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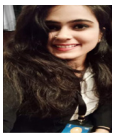
EVOLVING DYNAMICS OF SPACE COOPERATION BETWEEN INDIA AND JAPAN



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The Asia-Pacific region is widely involved in developing space activities, and a lot of nations from the region have acquired space capabilities for various reasons. Activities such as commercial and security space activities are paramount for countries. Most countries aim at looking into unique capabilities and aspects of outer space by promoting space exploration and science. A study conducted by the University of Tokyo and the National Institute of Advanced Studies (NIAS) explored the commonalities in space policies between India and Japan. Both India and Japan possess major spacefaring capabilities in the Asia-Pacific region which enhances their capability to access space. Subsequently, both nations have developed a variety of space systems for applications such as remote sensing, navigation, communication, and meteorology. Both nations have been vital and similar in their space policy orientations. India has been focussing on the use of space for national development for a long time under the space policy set by Dr Vikram Sarabhai, whereas, Japan began its space activities in the 1950s with the development of a pencil rocket by Professor Hideo Itokawa.[1]

The 2015 Space Policy seeks to strengthen space security and promote the use of space for national as well as international security.

Space policy of Japan and India: Brief Background

In 1964, at the University of Tokyo, the Institute of Space and Aeronautical Science (ISAS) was established, which marked the beginning of the Japanese space policy. In the 1990s and 2000s, the US-Japan trade conflict rose and Japan faced condemnation from

the US regarding the policy of the Japanese government to protect the domestic space industry through unfair satellite protocols. Eventually, Japan established the 'Basic Space Law' in 2008, which defined the policy orientations of Japan's space activities.[2] These policy orientations included improving the lives of citizens, encouraging Japan's space industry, strengthening national and international security, promoting international cooperation, and advancing science and technology.

The space activities in both India and Japan have been developed predominantly for the development of scientific disciplines.

The Japanese government had devised the 'Basic Plan on Space Policy' and in 2015, the plan was reformed by the strategic headquarters for space policy.[3] The 2015 Space Policy seeks to strengthen space security and promote the use of space for national as well as international security. It further attempts to work towards ensuring stability of outer space in the long run through Space Situational Awareness (SSA), efforts to create norms of behaviour in space, and improving critical space systems. Space security has also been mentioned under the guidelines for US-Japan defence cooperation. It is believed to be a vital part of the US-Japan alliance.

For India, the administrative domain for space comes directly under the Prime Minister and gives space activities a high level of authority. The Indian Space Research Organisation (ISRO) is organised into centres that address areas of space technology that include rocket development, satellite design and manufacture, launch complex, mission operations, remote sensing applications, and space science.[4]

Space cooperation between India-Japan

Japan and India show similarities in their respective space policy orientations, and the emphasis has been on promoting space applications for the benefit of society. India has been focused on the development and use of space for its national development. The space activities in both India and Japan have been developed predominantly for the development of scientific disciplines . Over time, the space activities of India have become more widespread in terms of including scientific missions and planetary exploration, like the Chandrayaan-1, Mars Orbiter Mission (MOM-1) and Chandrayaan-2.[5] India has also shown its keen interest in developing human spaceflight in the near future with its Gaganyaan programme. Japan possessed experience in scientific missions and planetary exploration ever since it launched its first satellite, Ohsumi.[6]

In the 2008 Joint Declaration between the Prime Ministers of both the countries,

there was a special mention about the cooperation between the space organisations of the two nations, viz. the Japan Aerospace Exploration Agency (JAXA) and ISRO.[7] Both agencies aim to cooperate in the field of disaster management. JAXA was created in 2003 and its main objective was to set up the new Japanese space policy consisting of launchers and satellites.

SSA has the ability to track and identify objects in outer space, and international cooperation for SSA information sharing would improve this ability in every nation. Both nations are also looking at the potential for the privatisation of space with regard to investment and ownership of space in the private sector.

There is growing integration between space and security in India and Japan in the recent times. The Basic Space Law of Japan opened opportunities for using space for national and international security. At the same time, India's space activities have also evolved and now includes the security aspects as ISRO has launched space assets that will help in contributing towards the national security of India. In the India-Japan Joint Statement of the 'Vision 2025: Special Strategic and Global Partnership', PM Narendra Modi and Shinzo Abe expressed their views that strategic partnership requires broad-based cooperation in fields of defence, security, culture, and economy. The future-oriented goals and partnership of the two nations aim to focus on infrastructure, high technology, civil nuclear energy, space, biotechnology, rare earth, and advanced materials.

There are several areas of potential space cooperation between India and Japan. Both nations recognise that the legal and policy regimes are vital for regional and global cooperation. India and Japan have huge capabilities for satellite building and satellite launching. Both countries can perhaps hold joint missions in space science instruments, launch systems, and human spaceflight technology for further planetary explorations.

The critical areas of space cooperation between India and Japan are the following:

1. Satellite positioning and navigation systems: Both countries attempted to develop regional satellite position systems through the Quasi-Zenith Satellite System (QZSS). This would also offer operational positioning services to countries in the Asia-Pacific region.

2. Disaster management is an area where both nations can cooperate in the utilization of space. Japan is highly prone to natural disasters and experienced the Great East Japan Earthquake in 2011, which showed the importance of space technology in disaster response.[8] Emergency satellite observation helped the Japanese government in understanding the damage that occurred in the affected areas. Space cooperation

could also enable the nations to update the disaster prevention map and also understand climate change.

3. Since both India and Japan have programmes for space science and planetary exploration, it would require robotic technology and automation for future missions. Therefore, space robotics could be an area of interest for both nations. The collaboration should be aimed at creating joint missions for the India-Japan space robotics mission.

The uniqueness and commonalities in the space policies of India and Japan provide an opportunity for space collaboration between the two in the near future. Their space cooperation would contribute to the overall social development in the Asia-Pacific region by enhancing regional space capabilities.

4. India and Japan also share a deep potential for space cooperation in the maritime domain. Space-based Maritime Domain Awareness (MDA) and Space Situational Awareness (SSA) are areas where both nations can enhance their cooperation through information sharing. Both nations work towards securing Sea Lanes of Communication from the Middle East through the Indian Ocean to the South China Sea and the East China Sea. Therefore, Japan and India have made efforts to understand the MDA in the area of maritime security. It is tough for any nation to achieve an understanding of the maritime situation all alone. Therefore, cooperation with other countries and collaboration for information sharing and satellite information is vital. Japan-India cooperation in sharing space-AIS data will expand the international cooperation and improve the MDA in the Indo-Pacific region too.

SSA has the ability to track and identify objects in outer space, and international cooperation for SSA information sharing would improve this ability in every nation. Furthermore, both nations are also looking at the potential for the privatisation of space with regard to investment and ownership of space in the private sector. Since Japan is the world's third-largest economy, its industries possess the capacity to develop whole systems of satellites and launch vehicles. However, India is yet to develop this since industries are in a sub-system mode. Japan's potential to use the Indian space capability arena through industry involvement at the space agency level could be immense.

Recent Endeavours

In March 2021, the then chairman of ISRO, Dr. K Sivan, held a meeting with Dr. Hiroshi Yamakawa, President of JAXA, wherein the two sides decided to cooperate further on lunar cooperation, satellite navigation, and agreed to explore the potential for cooperation in the area of SSA[9]. Both space agencies signed an implementing

arrangement for collaborative activities on rice crop area and air quality monitoring using satellite data.

In 2019, the first India-Japan Space Dialogue was held where the space agencies focused on surveillance and MDA in the South China Sea and the Indian Ocean[10].

The space dialogue between New Delhi and Tokyo is widely driven by China's aggressiveness and the consequences of China's rise. India and Japan cannot compete with China's growing military power in outer space as well. Both India and Japan can, together, bring some changes in the emerging space security dynamics. Moreover, the changing nature of warfare in the international community is also one of the challenges ahead for space cooperation between the two nations.

In November 2021, the 2nd Space Dialogue was held virtually between India and Japan, and both space agencies discussed their space policies and priorities.[11] They also focused on increasing cooperation in the areas of space security, navigation satellite systems, SSA, and bilateral cooperation between ISRO and JAXA.

The uniqueness and commonalities in the space policies of India and Japan provide an opportunity for space collaboration between the two in the near future. Their space cooperation would contribute to the overall social development in the Asia-Pacific region by enhancing regional space capabilities. Both nations have not indulged in the militarisation of space for their space policy orientations. An India-Japan joint space mission could prove to be efficient in the areas of earth observation, planetary mission, space robotics, and this would give a boost to space activities at the international level.

Notes:

[1] Ryojiro Akiba, "A passion for Rocketry", Japan Aerospace Exploration Agency, https://global.jaxa.jp/article/interview/2013/vol77/index_e.html. Accessed on February 26, 2022.

[2] Yuichiro Nagai, "Policy Analysis: Space Programmes of Japan and India", 66th International Astronautical Congress, Jerusalem, October 2015. Accessed on February 27, 2022.

[3] Ibid.

[4] Department of Space, Indian Space Research Organisaton, https://www.isro.gov.in/sites/default/files/article-files/node/8696/1-organisation_fuction_.pdf. Accessed on February 26, 2022.

[5] "Chandrayan-1", *Indian Space Science Data Centre*, https://www.issdc.gov.in/chandrayaan1.html. Accessed on February 27, 2022.

[6] "The 10 countries most active in space", *Aerospace Technology*, December 21, 2015 https://www.aerospace-technology.com/features/featurethe-10-countries-most-active-in-space-4744018/. Accessed on February 28, 2022.

[7] "Joint declaration on Security cooperation between India and Japan", Ministry of Foreign Affairs, October 22, 2008, https://www.mofa.go.jp/region/asia-paci/india/pmv0810/joint_d.html.s Accessed on February 28, 2022.

[8] Kazayu Kaku, "Space-based response to the 2011 Great East Japan Earthquake: Lessons learnt from JAXA's support using earth observation satellites", I*nternational Journal of Disaster Risk Reduction*, Vol 12, June 2015. Accessed on March 01, 2022.

[9] T.E. Narasimhan, "ISRO, Japanese space agency join hands to monitor air quality", *Business Standard*, March 11, 2021, https://www.business-standard.com/article/current-affairs/isro-japanese-space-agency-join-hands-to-monitor-air-quality-121031100865_1.html . Accessed on February 28, 2022.

[10] "First India-Japan space dialogue", Ministry of External affairs, March 8, 2019, https://www.mea.gov.in/press-releases.htm?dtl/31133/First_India__Japan_Space_Dialogue. Accessed on February 28, 2022.

[11] Aanchal Nigam, "India-Japan hold 2nd Space dialogue virtually; discuss space policies and priorities", *Republic World*, November 2, 2021, https://www.republicworld.com/world-news/rest-of-the-world-news/india-japan-hold-2nd-space-dialogue-virtually-discuss-space-policies-and-priorities.html. Accessed on February 28, 2022.

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