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# Astropolitics for the Indo-Pacific: Motives behind Space Collaboration between Japan and India

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# *Astropolitics for the Indo-Pacific: Motives behind Space Collaboration between Japan and India*


## *Abstract*

Dopo la Seconda guerra mondiale, dagli anni Sessanta del ventesimo secolo, lo spazio extraatmosferico acquisì un'importanza fondamentale per gli Stati Uniti d'America e l'Unione Sovietica: la strategia di mutua deterrenza nucleare generò infatti un grande richiesta da parte militare di missili balistici intercontinentali (ICBM) e di satelliti spia. La competizione spaziale tra Stati Uniti e URSS, iniziata il 4 ottobre 1957 con la messa in orbita del satellite sovietico *Sputnik* in occasione dell'Anno Geofisico Internazionale 1957/1958, generò grande progresso scientifico e nuovi ambiti di cooperazione internazionale nel contesto delle Nazioni Unite, con la fondazione della Commissione per gli Usi Pacifici dello Spazio (United Nations Commission on the Peaceful Uses of Outer Space – UN COPUOS) nel 1959. Tuttavia, la prima Corsa allo Spazio portò anche alla formulazione, da parte dei governi degli Stati Uniti e dell'URSS, di strategie di difesa innovative in cui, per la prima volta nella Storia, lo spazio extraatmosferico figurò come quarta dimensione fisica della sovranità nazionale. Tali considerazioni, evidenti soprattutto nella politica statunitense, derivano dalla particolare rilevanza data dall'Amministrazione Truman allo sviluppo scientifico e tecnologico, secondo la teoria realista delle relazioni internazionali fortemente associato alla manifestazione di potenza dello Stato. Per ciò che concerne lo spazio, dalla fine degli anni Cinquanta del secolo scorso questa assunzione premette, in totale opposizione all'internazionalismo scientifico basato sulla cooperazione internazionale e sovrannazionale delle comunità di ricerca, l'utilizzo di asset e innovazioni tecnologiche per l'esplorazione spaziale come mezzi per l'ascesa e il mantenimento del potere politico nell'arena internazionale.

Parzialmente collegato alla concezione realista di sviluppo scientifico e tecnologico è il concetto di *smart power*, che nel contesto della storia dell'esplorazione spaziale ha acquisito particolare importanza per la sempre maggiore diffusione di sistemi satellitari ad utilizzo duale, da cui sicurezza nazionale e società civile dipendono sempre più fortemente. La capacità di acquisizione e utilizzo di nuove conoscenze e informazioni per migliorare le tecnologie di difesa dello Stato e creare un modello di società positivo sia per la comunità interna che nel contesto internazionale (ciò che per Ernest J. Wilson III è, appunto, lo *smart power*) è diventata, a partire dagli anni Ottanta del ventesimo secolo, la finalità dei programmi spaziali nazionali più avanzati, che a partire dagli anni Sessanta hanno popolato lo spazio con satelliti e missioni interplanetarie.

Tra i programmi spaziali nazionali stabiliti durante e nel periodo immediatamente successivo all'Anno Geofisico Internazionale 1957/1958, il caso giapponese e quello indiano si distinguono per origini e regione geopolitica di appartenenza e, pertanto, il loro sviluppo e la recente cooperazione spaziale tra Tokyo e Nuova Delhi sono oggetto del presente elaborato. La storia dei programmi spaziali di Giappone e India, così come i cambiamenti delle politiche spaziali nipponica e indiana, sono infatti lo specchio di mutamenti più ampi dell'attitudine di Tokyo e Nuova Delhi nei confronti della comunità internazionale e di partner e potenziali avversari in Asia e nel Pacifico. Pertanto, il presente studio considera la cooperazione scientifica tra il programma spaziale giapponese e quello indiano, iniziata ufficialmente tra il 2016 e il 2017 e attualmente concentrata su una missione di esplorazione del polo meridionale della Luna prevista per l'estate del 2023, come primo esito della trasformazione delle politiche spaziali giapponese e indiana, avvenuta all'inizio del ventunesimo secolo in risposta alla crescente assertività della Repubblica Popolare Cinese, in ambito spaziale e di difesa.

Questo elaborato si concentra sull'evoluzione dei programmi spaziali nazionali di Giappone e India, i primi due Stati del continente asiatico a dedicarsi all'esplorazione spaziale. Il programma spaziale giapponese ebbe origine negli anni Cinquanta del ventesimo secolo, dopo l'abolizione del divieto di progettazione e costruzione di aeroplani e missili giapponesi a seguito dell'entrata in vigore del Trattato di San Francisco nel 1952. L'ideatore del programma spaziale nipponico fu Itokawa Hideo, docente presso l'Istituto di Scienze Industriali dell'Università di Tokyo, che nel 1954 fondò l'Avionics and Supersonic Aerodynamics Research Group (AVSA). Il successo dei prototipi missilistici dell'AVSA, i primi interamente progettati e assemblati da ingegneri giapponesi, convinsero il governo nipponico della validità scientifica ed economica del progetto di Itokawa e dei suoi ricercatori; di conseguenza, nel 1959 le attività di studio ed esplorazione spaziale dell'Università di Tokyo furono riunite nell'Institute of Space and Aeronautical Science (ISAS). A supervisione dell'ISAS e delle future missioni del programma spaziale giapponese fu istituito un ente governativo, la National Space Development Center of the Science & Technology Agency. Tuttavia, negli anni Sessanta una serie di lanci falliti da parte dell'ISAS e la proposta statunitense di utilizzare un missile americano per mettere in orbita il primo satellite giapponese causarono l'autolicenziamento di Itokawa e la ristrutturazione da parte di Tokyo del programma spaziale in due agenzie tra loro indipendenti e rivali: l'ISAS dell'Università di Tokyo, che mantenne viva l'idea di Itokawa di sviluppare tecnologia spaziale nipponica senza il patrocinio e l'ausilio statunitensi e si dedicò prettamente a missioni scientifiche, e la nuova National Space Development Agency (NASDA), ente governativo supervisionato dall'Ufficio di Gabinetto del Primo Ministro e in stretta collaborazione con la NASA. Il supporto statunitense ai progetti della NASDA per lo sviluppo del settore delle

telecomunicazioni satellitari, così come l'avanzamento degli studi missilistici dell'ISAS, furono però legati dalla Dieta Nazionale al rispetto dell'Articolo 9 della Costituzione giapponese, prevenendo di fatto qualsiasi sviluppo di tecnologie dual use nel settore spaziale fino all'inizio del ventunesimo secolo.

Il programma spaziale indiano ha avuto origini e fini di pura utilità civile per volere del suo creatore, Vikram Sarabhai, fisico di fama internazionale e vicino al Partito del Congresso di Jawaharlal Nehru. Il Premier indiano sponsorizzò i primi progetti spaziali del Physical Research Laboratory (PRL) di Sarabhai in corrispondenza dell'Anno Geofisico Internazionale 1957/1958. Come Itokawa Hideo, che collaborò con il programma spaziale indiano nei primi anni Settanta, Vikram Sarabhai credeva nella necessità per l'India di sviluppare tecnologie spaziali proprie e completamente autonome per risolvere i problemi economici, ambientali e sociali delle popolazioni indiane attraverso programmi televisivi educativi trasmessi per via satellitare. Inizialmente sotto l'autorità dell'Atomic Energy Authority, nel 1969 l'Indian National Committee for Space Research (INCOSPAR) acquisì totale indipendenza dal programma nucleare indiano e fu fondata l'Indian Space Research Organization (ISRO), sotto la direzione di Vikram Sarabhai fino alla sua morte improvvisa nel 1971. Come voluto da Sarabhai, tutte le missioni satellitari e di esplorazione dello spazio profondo di ISRO hanno scopi puramente scientifici ed educativi per la popolazione indiana; inoltre, il programma spaziale indiano ha beneficiato, a partire dalla sua fondazione, di aiuti internazionali da parte di Stati Uniti, URSS e Stati europei, con il supporto del Programma per lo Sviluppo delle Nazioni Unite. Nondimeno, dalla fine degli anni Settanta del secolo scorso, il governo di Nuova Delhi ha progressivamente avvicinato di nuovo le ricerche di ISRO al programma nucleare indiano, approvando progetti di studio in campo missilistico in collaborazione con la Defense and Research Development Organization (DRDO), organo istituzionale per lo sviluppo di tecnologie militari.

I programmi spaziali di Giappone e India, fondati con scopi prettamente civili, hanno acquisito prestigio internazionale nel corso del ventesimo secolo per i numerosi traguardi scientifici e, soprattutto nel caso indiano, il grande contributo alla modernizzazione del proprio Stato di appartenenza. Ciononostante, all'inizio del ventunesimo secolo, con l'evidente successo del programma spaziale della Repubblica Popolare Cinese e lo sviluppo da parte di Pechino di asset spaziali con tecnologie ad uso duale (particolarmente importanti quelle antisatellite o ASAT) parallelo ad una sempre maggiore assertività della Cina in Asia e nelle relazioni internazionali, Tokyo e Nuova Delhi hanno sentito l'esigenza di ristrutturare e riorganizzare i propri programmi spaziali anche per rispondere alle nuove esigenze politiche di sicurezza nazionale e prestigio dei propri Stati vis-à-vis la crescente preponderanza cinese.

In Giappone, la Basic Space Law del 2008 ha, di fatto, superato i divieti imposti al programma spaziale nipponico dalla Dieta Nazionale; di conseguenza, la Japan Aerospace Exploration Agency (JAXA), fondata nel 2003 dall'unione di ISAS e NASDA, pur continuando ad avere scopi essenzialmente di ricerca scientifica e divulgazione, ha potuto sviluppare nel corso degli ultimi decenni tecnologie spaziali dual-use per il Ministero della Difesa (MOD) giapponese. La collaborazione tra JAXA e MOD è stata inoltre favorita, a partire dal 2012, dall'allora Premier nipponico Abe Shinzō, il cui governo ha proposto una interpretazione più blanda dell'Articolo 9 della Costituzione giapponese per poter applicare la strategia nazionale per un "Free and Open Indo-Pacific" nel continente asiatico e nel Pacifico. In tale contesto, Tokyo ha sin da subito individuato Nuova Delhi come un alleato fondamentale nella regione.

Da parte sua, dal 2014 l'India, con la premiership di Narendra Modi, ha sempre più fortificato il legame tra ISRO e DRDO favorendo programmi di ricerca comuni e lo sviluppo di lanciatori dual-use, non promulgando tuttavia alcuna normativa federale per regolare il settore spazio indiano. Tale confusione interna al sistema spazio di Nuova Delhi, unita alla spiccata modernizzazione e al potenziamento della difesa indiana grazie ai programmi congiunti tra ISRO e DRDO, ha reso la *space diplomacy* dell'India poco convincente in Asia e tra gli Stati dell'Indo-Pacifico, legati in ambito spaziale all'Asia-Pacific Regional Space Agency Forum (APRSAF), fondato dal Giappone nel 1993. La maggiore popolarità della *space diplomacy* nipponica nel continente asiatico e a livello internazionale, anche grazie alla stretta collaborazione tra Tokyo e il COPUOS, ha certamente facilitato la cooperazione spaziale tra JAXA e ISRO, fortemente promossa dai governi di Abe e Modi nel 2016 per legare ulteriormente Giappone e India nella competizione regionale con la Repubblica Popolare Cinese. Il primo risultato della cooperazione spaziale tra Tokyo e Nuova Delhi è una missione congiunta di allunaggio ed esplorazione del polo meridionale della Luna, dove una precedente missione di ISRO ha individuato tracce di acqua lunare ghiacciata. La missione, denominata LUPEX, è prevista per l'estate del 2023 e, se di successo, restituirà ai programmi spaziali nipponico e indiano (e di conseguenza ai rispettivi governi) quel prestigio a livello regionale e internazionale offuscato nel corso dello scorso decennio dalle conquiste del Chinese Lunar Exploration Program (CLEP), aprendo una nuova era di corsa allo spazio in Asia.

## *Introduction*

Space has been considered the final frontier of human exploration for over a century. The Russians were among the first to be fascinated by the possibility of navigating the cosmos. The almost legendary rocket scientist Konstantin Tsiolkovsky published pioneering research papers in the late 19th and early 20th centuries[1]. However, at the end of World War II and during the 1960s, rocket science acquired pivotal importance in the minds and strategies of the American and Soviet governments, with mutual nuclear deterrence fueling the military request for intercontinental ballistic missiles and spy satellites. The Space Race not only highly encouraged scientific research but also became the inspiration for security strategies and political discussions that are still being applied and implemented nowadays.

The number of states part of the discourse around space exploration has increased over the decades. Indeed, several countries joined the US and Russia in the scramble for space. Among them, Japan, the People's Republic of China, and India distinguished themselves for early and impressive rocket developments and subsequent launches dating back to the 1960s and 1970s. By studying the outstanding progress and failures of the American and the Soviet space programs and progressively affirming their respective positions in the global arena, Japan, the PRC, and India absorbed and reinterpreted the two main analytical frameworks of Space Politics.

Such strategic foundations, namely realism and scientific internationalism, appear on the opposite sides of a broader range of political interpretations of space exploration and are frequently labeled mutually exclusive. The realist theory focuses on the military use of Space. In contrast, scientific internationalists praise space cooperation in all degrees and appeal for sharing research information and findings on a global scale. Specifically, the realist view on space exploration originates from the consideration by the Truman administration that science and technology are among the most influential national indicators of strength; this perspective is still indisputably the foundation of the US' *Astropolitik* at the present day, as well as the maintenance of global leadership[2]. By contrast, scientific internationalism designates science and technology as a unifying force for humankind and, therefore, space exploration as a turning point for the engineering world society[3]. Consequently, it

[1] J. T. Andrews and A. A. Siddiqi (edited by), Into the Cosmos. Space Exploration and Soviet Culture. Pittsburgh, University of Pittsburgh Press, 2011.

[2] E. Dolman, Astropolitik: Classical geopolitics in the space age. London, Frank Cass, 2002.

[3] D. Stroikos, Engineering world society? Scientists, internationalism, and the advent of the Space Age. In: *International Politics*, 2017.

seems questionable that such different approaches to space exploration could find common ground and verily serve one another's purposes, leastwise on a theoretical level.

However, the tense analytical discussion can occasionally be refuted by actual policies and strategies. Particularly in the case of space exploration, the present work will cover the lasting space cooperation between Japan and India, highlighting the anti-Chinese intent of the more recent Japanese Space Strategy and its aim to further captivate India in the Free and Open Indo-Pacific plan through scientific cooperation.

In the remainder of this production, the Japanese Space Program, its ties to the Free and Open Indo-Pacific strategy, and the purpose given by Tokyo to space collaboration between Japan and India will be analyzed. Finally, to further prove the object of this output, a brief deconstruction of the Chinese Space Program and the renewed American Pivot to Asia will be presented. The present work bases its findings on previous illustrious studies on space exploration, space politics, and diverse sources, which will be clarified in the following section.

## *Research Theory and Methodology*

This chapter introduces the research methodology for this mainly qualitative study on space cooperation between Japan and India and its ties to the Japanese Free and Open Indo-Pacific strategy. Such perspective allowed for a deeper understanding of the historical collaboration between Japan and India in developing space technologies and a captivating analysis of space exploration's role in the anti-Chinese strategy that Japanese governments have put forward since the early 2000s.

### *Research Question*

This study wishes to identify the most reasonable interpretation of 21st-century Japanese Space Politics, explicitly considering the scientific cooperation between Japan and India in space exploration, which deepened in 2017 through the signing of an Implementation Arrangement for a joint lunar polar exploration mission between the Japanese and the Indian national space agencies. Furthermore, the present work focuses on foregrounding the ties between the Japanese Space Politics of the last 20 years and the Free and Open Indo-Pacific initiative, which has shaped Japanese security diplomacy since 2013. Finally, India's Look East and Act East policies are also analyzed to highlight the political motives behind New Delhi's adhesion to Tokyo's proposition of a cooperative lunar expedition project.

### *Theoretical Framework*

This study offers a window into Japanese Space Politics and their solid relationship with Tokyo's stance in the international arena, especially concerning India and the region indicated by the term "Indo-Pacific." By investigating the link between space exploration and the forming alignment between Japan and India in Asia vis-à-vis a growing Chinese technological power globally and in the region, the present work hopes to underscore the strategic role that space, hence scientific diplomacy, has acquired since the beginning of the 21st century, particularly for Asian international politics, given that Japan, India, and the People's Republic of China are considered space powers in all effects by the international community. Moreover, as several ASEAN Member States and South Asian countries have been developing their national space programs with Japanese or Chinese assistance, this study desires to serve as a base for further research on Asian developments in space exploration and regional space policy, which we believe will critically affect future global space, and especially Moon exploration and utilization.

The present investigation aims to analyze the evolution of the Japanese Space Policy and scientific diplomacy and the less normatively organized Indian Space Policy in the 21st century through an eclectic approach. For what concerns the governmental approach to space exploration and space

policy, this work identifies the realist interpretation as the most fitting. Realism has crucially influenced the practice of international politics worldwide and emphasizes the omnipresence of power and the competitive nature of the relationships among States. Moreover, realist theory argues that land, sea, and skies are the main three dimensions of national security; therefore, States consider them and all their related resources a primary factor when shaping national strategies and security policies[4]. Following this path, space has been considered the fourth dimension of state security since the launch of the Soviet satellite *Sputnik-1* in 1957, leading to the translation of realist geopolitical tactics to the exploration of the cosmos[5]. In the 21st century, space has become even more relevant for national security due to the inherently dual use of space technologies and the massive use of space-based services in all aspects of life in modern States.

Furthermore, the global dependency on space services justifies the conception of science and technology as indicators of national power and prestige, also considered by the present investigation. In 2007, Joseph Nye and Richard Armitage chaired a Center for Strategic and International Studies (CSIS) project to define smart power. The research concentrated on the practical interpretation of smart power as a variety of tools designed to legitimate the State's actions underscoring the need to combine hard power and soft power mechanisms to achieve specific foreign policy objectives[6]. Besides, as indicated by Ernest J. Wilson, III, in his article titled *Hard Power, Soft Power, Smart Power* (2008), for industrial and post-industrial States, power growingly resides in a nation's ability to produce and use knowledge and information in a way that can enhance and progress its defense capabilities while also targeting domestic and international populations with an appealing societal and cultural model[7]. Regarding space exploration, the USSR and the United States first used smart power when assessing their respective national space programs and indicating the objectives of their space endeavors. They favored internal propaganda and international prestige and implemented their military assets with new technologies and advantages. As the world has entered a new space race since the beginning of the 21st century, other space nations have been exceptional users of smart power for advantage in domestic policy and shaping the global governance of space. Among these States, Japan has been remarkably consistent in not only presenting itself as a highly-technological and science-committed country to the international community but also in employing its space program to modify its security strategy and its political stance in Asia, as this study wishes to convey

[4] H. Morgenthau, 1962, via A. Zimelis, Human Rights, the Sex Industry and Foreign Troops: Feminist Analysis of Nationalism in Japan, South Korea and the Philippines. In: *Cooperation and Conflict*, 2009.
[5] E. Dolman, 2002.
[6] Y. Heng, Smart Power and Japan's Self-Defense Forces. In: *The Journal of Strategic Studies*, 2015.
[7] E. J. Wilson, III, Hard Power, Soft Power, Smart Power. In: *The Annals of the American Academy of Political and Social Science*, 2008.

with an analysis of Japanese domestic space law and Japanese dedication to regional and international space governance structures as a relevant part of Tokyo's foreign policy.

The application of smart power in space has significant links with Astropolitics. This framework has been increasingly influencing international relations with the discovery of primary resources on the Moon and other celestial bodies, such as water and lunar dust or regolith. Everett C. Dolman defines Astropolitics as 'the study of the relationship between outer space terrain and technology and political and military policy and strategy development[8].' Since the first scramble for space in the 1960s, research has generally focused on Astropolitics behind prominent rivalries for global hegemony, such as the one between the United States of America and the USSR and, more recently, between the US and the People's Republic of China. Nevertheless, little attention has been paid to the Astropolitics of the Asian continent in general and, more specifically, to space diplomacy's effect in shaping alliances and balancing strategies in the area since the early 2000s. A branch of science diplomacy, space cooperation typically happens between national space agencies, following international conventions and ad hoc agreements for scientific and technical exchanges and collaboration between the participant States. It was adopted first by Japan in Asia, with China and India following during the 2010s and receiving diverse responses from their regional and international partners. In viewing space as a pivotal driver of Japanese and Indian foreign policies in the 21st century, the present work interprets Tokyo's and New Delhi's space diplomacy as a device to create and enforce stable alliances in Asia to maintain power and contrast Chinese influence.

Indeed, to examine Asian space collaboration, this study heeds the multifaceted definition of science diplomacy given by Bhaskar Balakrishnan in his article titled *Science and Technology Dimensions of Indian Foreign Policy* (2019). Here, science diplomacy is defined as the full integration of science and technology into a country's diplomatic and foreign policy framework; in line with the *New Frontiers of Science Diplomacy* declaration[9], Balakrishnan further divides science diplomacy into three components: science in diplomacy, diplomacy for science, and science for diplomacy. The science and diplomacy aspect regards the relationship between the country's science and technology experts and policymakers, which aims to respond more efficiently to international challenges through internal coordination. The diplomacy for science facet involves external collaboration to a State's foreign policy by its science and technology experts, who should acquire or expand the national scientific knowledge, hence smart power, by participating in international discussions and exchanges on discoveries and technological advancements. Lastly, the science for diplomacy side concerns national adhesion and the promotion of large-scale international scientific projects that would

[8] E. Dolman, 2002.

[9] C. Kaltofen, M. Acuto, Science Diplomacy: Introduction to a Boundary Problem. In: *Global Policy*, 2018.

assemble equips from fundamentally different, and in some cases politically distant, countries to initiate diplomatic dialogue, potentially leading to cost-sharing and information acquiring[10]. This composite definition of science diplomacy perfectly suits space cooperation, given that, as the present work will delineate, space exploration missions have been a means for Japan and India to establish national prestige domestically and in Asia and to promote their respective national strategies opposite to the growing Chinese technological and political power. Particularly regarding the current state of scientific space cooperation between Japan and India, the present investigation follows Balakrishnan's view of science diplomacy, as the Japanese and the Indian scientific communities are directly involved in international exchanges and collaboration between Tokyo and New Delhi, hence acting as a foreign policy agent. Verily, in gathering and examining detailed official sources on space cooperation projects between the Japanese and the Indian space agencies, we noticed that many valid documents were technical reports and scientific statements that formally authenticate the ongoing joint mission in international scientific conferences and among the global space governance actors.

Finally, this work used the analytical typology of minilateral security cooperation offered by Paik Wooyeal and Park Jae Jeok[11] to frame Japanese attitude toward the People's Republic of China and the Quadrilateral Security Dialogue or QUAD in its two iterations, in 2007 and 2017. The authors describe the QUAD as deriving from multiple minilateral security alliances or coordination policies, defined as 'meetings between small subsets of nations, typically three or four, designed to address common security interests in a more focused setting[12].' These groups can be divided into three categories, depending on their purposes. Group 1 augments existing multilateral cooperative institutions within the institutions' structure; Group 2 is usually created to contrast or resolve a specific contingency and is not supported nor controlled by any institution; lastly, Group 3 constitutes a more complex structure apt to cover broader agendas, with pre-selected members and the goal of impacting regional orders and international relations in general. Paik Wooyeal and Park Jae Jeok explain that the three minilateral security groups can expand into three types of multilateral security cooperation, with Type 1 aiming to strengthen Group 1's or Group 2's targets, Type 2 focusing on assessing issues related to the principal purposes of either Group 1 or Group 2 and Type 3 coveting to create a bloc or to influence regional order[13]. Type 1 and Type 2 multilateral security cooperation is typically fostered by the need for the minilateral groups to tackle their growing agendas more

[10] B. Balakrishnan, Science and Technology Dimensions of Indian Foreign Policy. In: *Indian Foreign Affairs Journal*, 2019.
[11] W. Paik, J. J. Park, The Quad's Search for Non-Military Roles and China's Strategic Response: Minilateralism, Infrastructure Investment, and Regional Balancing. In: *Journal of Contemporary China*, vol. 30, no. 127, 2021.
[12] U.S. Department of Defense via W. Paik, J. J. Park, 2021.
[13] W. Paik, J. J. Park, 2021.

efficiently through coordination with other actors with similar interests. Type 3 is a state-driven process intentionally designed to target a regional or a global rival. However, the authors warn that States part of Type 3 multilateral cooperation frameworks often promote them as Type 2 collaboration to avoid condemnation from the targeted State and potential partners. Then, Paik Wooyeal and Park Jae Jeok categorize QUAD as a Type 3 expansion of Group 2 and Group 3 minilateral security alliances between Japan, the United States, Australia, and India[14]. The present study acknowledges this categorization and considers the minilateral security cooperation between Tokyo and New Delhi part of Group 3, especially since 2014, when Narendra Modi won the general elections for Prime Minister in India and Abe Shinzō started his third mandate as the Japanese Premier. In examining the Japanese approach toward the QUAD in 2017, we also briefly mentioned the Chinese perception of the Quadrilateral Security Dialogue, which coincides with the classification operated by Paik Wooyeal and Park Jae Jeok and endorsed by this investigation. We did so in the hope of conveying a more detailed presentation of the composite relationship between Japanese foreign policy and Asia, which, from our perspective, is essential to understanding the political meaning of space cooperation between Japan and India.

***Methodology***

The present study predominantly relied on qualitative sources to describe historical events and examine political theories to achieve a scientifically accurate analysis. Therefore, previous academic work on the history of space exploration, international politics, and geopolitics of the Asian continent has been selected together with sectorial magazine and newspaper articles. Furthermore, engineering and quantitative astrophysical studies by national space agencies from the countries considered have also been scrutinized for a broader comprehension of deep space exploration and the lunar missions mentioned in this investigation.

The present work intends to analyze the space cooperation between Japan and India in the 21st century from a historical approach, focusing on the history of the Japanese and the Indian Space Program and their recent developments vis-à-vis the numerous accomplishments achieved by the Chinese Space Program since the early 2000s. In this context, research has been conducted using secondary literature on the history of Asian national space programs and official documents from the National Diet of Japan, the Ministry of Defense of Japan, and the Ministry of Foreign Affairs of Japan. All the official documents from Japanese institutions considered in this study have been examined in their official English translations. Regarding the Indian Space Program, news articles from the Prime Minister's

[14] W. Paik, J. J. Park, 2021.

Press Office and national newspapers such as The Hindustan Times. Moreover, Japanese and Indian "Indo-Pacific" strategies have been analyzed based on secondary literature and publications by Abe Shinzō during his years of political activity since the beginning of the 21st century to bestow historical motivations for the configuration of space cooperation between Tokyo and New Delhi. In this sense, the evolution of the US approach to Asia and the "Indo-Pacific" framework has also been presented together with a brief recapitulation of the theoretical transformation of the geopolitical meaning of "Indo-Pacific" via consultation of secondary literature and official documents from the White House and the White House Presidential Archives. Official records from the Association of Southeast Asian Nations (ASEAN) have also been consulted. Finally, working materials and official communiqués from the United Nations Office for Outer Space Affairs (UNOOSA), the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), and the United Nations General Assembly (UNGA) have been examined to establish a short history of Japanese and India space diplomacies, together with scientific documents and mission schedules from the websites of the Japan Aerospace Exploration Agency (JAXA), the Indian Space Research Organization (ISRO), the National Aeronautics and Space Administration (NASA), the Vietnam Academy of Science and Technology, and the State Council of the People's Republic of China. All the official documentation considered by the present investigation has been studied in its official English translation when English was not the official language of the institutions that issued the abovementioned records.

***Conclusions***

The present chapter introduced the methodology behind the research for this study, which wishes to identify the most reasonable interpretation of 21st-century Japanese Space Politics and Tokyo's space cooperation with New Delhi by relying on several analytic frameworks, including the realist conception of space, Astropolitics and the use of smart power, and science diplomacy, which have rarely been applied to the Asian space and political arena, if not in comparison with the United States and other Western space powers such as France and the United Kingdom. Furthermore, to offer a more comprehensive examination of our research inquiry, this work also uses the minilateral security agreement categorization operated by Paik Wooyeal and Park Jae Jeok to explore Japanese foreign policy in Asia in the 21st century, particularly during Abe Shinzō's terms as Prime Minister, which coincide with extensive reforms in Tokyo's space governance and the deepening of the partnership between Japan and India.

Considering that national space policies and Space Politics are inherently connected to national space agencies, the first and following chapter of the present investigation will focus on the history of the Japanese and Indian space programs from their establishment during the second half of the twentieth

century until the early 2000s, when the People's Republic of China attained to the status of Asian space power that Japan and India had enjoyed for decades.

## *Chapter 1: Asia's Space Powers*

A growing Asian influence in international relations in the last thirty years has stimulated great political attention to the main actors of this vibrant region. The involvement of the most relevant Asian economies in the international marketplace and the resurgence of global interest in the evolving strategic assets in Asia might also be considered the results of Japanese, Indian, and Chinese national efforts to obtain general recognition in several vital sectors, including science and technology. In this sense, space activity is an essential piece of the puzzle.

Indeed, Asian curiosity in space and rocket technology reverts to the Sanskrit *Rig Veda* (some dated before 1000 B.C.), where it is possible to find the earliest known written description of an object resembling a rocket[15]. Similarly, ancient Chinese astronomers refined their scientific system during the Shang dynasty (c. 1600 B.C. – 1045 B.C.). Several Asian civilizations, including the Chinese, the Indians, and the Koreans, used small projectiles and incendiaries from the thirteenth to the nineteenth centuries for various purposes[16]. These advanced technologies eventually improved the military assets of the British Empire and the other Western States which colonized Asia in the eighteenth and nineteenth centuries. The first half of the twentieth century saw the West and the Soviets leaping toward vanguard missiles.

In contrast, Asian countries lacked these technologies because of insufficient resources, colonialization, or internal conflicts. However, this condition slowly changed during the second half of the twentieth century, with Japan, the People's Republic of China, and a newly independent India developing increasingly dependable and modern rockets for their national space efforts, which generally have been sponsored well by the countries' respective governments. Nowadays, the Japanese Aerospace Exploration Agency (JAXA) and the Indian Space Research Organization (ISRO) are among the most active national space agencies globally, with international cooperation programs also promoted within the United Nations framework and achieving high scientific and social relevance. This unconventional focus of JAXA's and ISRO's programs on intense global cooperation and socially applicable scientific achievements can be explained by the political history of the Japanese and the Indian space programs, which will be the central theme of this chapter.

However, China's rise as a regional power, and the official start of the second space age with the first crewed flight of the Chinese Space Program in 2003, triggered a change in both Japanese and Indian political approaches to space exploration, now more linked to major strategic concerns and the

[15] B. Harvey, H. H. F. Smid, T. Pirard, Emerging Space Powers – The New Space Programs of Asia, the Middle East, and South America. Chichester, Springer-Praxis Publishing Ltd., 2010.

[16] J. C. Moltz, Asia's Space Race – National Motivations, Regional Rivalries, and International Risks. New York, Columbia University Press, 2012.

growing rivalry between the PRC and the US in Asia[17]. These significant shifts will be analyzed in the final part of the present chapter.

***The Japanese Space Program: from the Genius of Itokawa Hideo to the ISS***

The Japanese Space Program's roots can be traced to World War II when between 1944 and 1945, the Imperial Navy attempted to manufacture a rocket frame and engine, following the German blueprints for the rocket-propelled fighter Messerschmitt 163, or *Komet*[18]. The results, however, were inadequate, for the Mitsubishi-made Tokuro-2, or *Shunsui* crashed landed on its first test flight and exploded on its second, killing the pilot in both cases[19]. A considerably more successful rocket-propelled kamikaze plane was the *Okha* ("cherry blossom"), last used in the battle for Okinawa in April and May 1945[20]. Mitsubishi and Kawasaki developed several other projects for liquid-fueled and air-to-surface guided missiles, yet none reached mass production.

The father of the Japanese Space Program, Itokawa Hideo (1912 – 1999), led the engineering team of the Nakajima Industries, which developed the *Hayabusa* ("hawk"), one of the most efficient Fighter aircraft models in service during World War II. Despite the numerous victories of the *Hayabusa* series, Itokawa was soon reassigned as an engineering professor at the University of Tokyo and could not participate in constructing Japan's rocket fighters. After the end of World War II, Itokawa studied the American and Soviet developments of the German V2 rockets, which were first tested in the atmosphere in the mid-1950s, hoping for Japan to reach similar achievements after the lift of the legal restriction on airplanes and rocket development in the San Francisco Treaty, in 1952. The Japanese government finally became interested in Itokawa and his Avionics and Supersonic Aerodynamics Research Group[21]'s studies on rocketry in 1954, when the International Geophysical Year (IGY) was announced. AVSA received ¥3.3m (€23,011) from the Ministry of Education and the Ministry of International Trade and Industry (MITI), with a supplement from Fuji Precision company, to expand its research on rocketry at the University of Tokyo and engage with the global scientific community as the representer of Japan. The first result of AVSA's efforts for the IGY was the solid-fueled rocket *Pencil*, first launched publicly on 12th April 1955 in a Tokyo suburb. The *Pencil* rocket was minuscule by international modern rocketry standards, for it was just 23 cm long with a diameter of 1.8 cm. Its first public launch gathered little but mostly enthusiastic domestic

[17] J. C. Moltz, 2012.
[18] The Imperial Japanese Navy was provided with the *Komet*'s blueprints under the Japan-Germany Technical Exchange Agreement (1943) to build an effective air defense asset against the Americans, who had planned to bomb Japan with heavy artillery.
[19] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[20] J. C. Moltz, 2012.
[21] From now on, AVSA.

public attention. After *Pencil*, AVSA developed *Pencil 3000* and its derivative *Baby*; both were tested in August 1955 at the new launch site established at Michikawa, in Akita province northwest of Honshu Island. These models were slightly bigger than the *Pencil* and proved to be a significant improvement toward Japan's first sounding rockets[22].

Itokawa and the AVSA received a second authorization from the Science Council of Japan to further pursue their research in 1956, with another ¥17.4m (€121,469) from the Japanese government to develop the first series of sounding rockets, the *Kappa*, which was launched between 1958 and 1961. One of these missiles, the *Kappa 6*, became the Japanese contribution to the IGY, with a substantial domestic public interest, which was surpassed only by the Soviet Union's astonishing *Sputnik* orbital flight in October 1957. After many successful launches of the *Kappa* series, exported to Yugoslavia and Indonesia during the 1960s, the Japanese government duly sponsored the buildout of Japan's next sounding rocket, the *Lambda*.

Itokawa founded the Japanese Rocket Society (JRS), the Japanese affiliate of the International Astronautical Federation (IAF), in 1956 to better engage with the international scientific community. In 1958, the Prime Minister's office established a National Space Activities Council (later renamed Space Activity Commission) to support space research. AVSA's activities were further enhanced with the Institute of Space and Aeronautical Science (ISAS) creation in 1959. ISAS became the new national organization for space research and remained under the University of Tokyo, where Itokawa's research started in the early 1950s. Itokawa's ambition was for Japan to develop its rocket technologies without the patronizing support of foreign national space agencies and investors. For this reason, when the United States offered a launcher to put the first Japanese satellite into orbit after multiple disastrous failures of the *Lambda* rockets in 1966, Itokawa resigned from his position as the head of ISAS and JRS after harshly criticizing Japan's dependence on the US.

After Itokawa departed from the Japanese Space Program, the Japanese government elevated the Space Activities Commission (SAC) under the Prime Minister's office as the senior advisory body for space policy coordination in 1968. It substantially transferred to the newly created National Space Development Center of Science & Technology Agency (NASDA, founded under Law #50, 23rd June 1969[23]) all the most crucial projects, including satellite development and the operation of launch facilities. ISAS was left to develop other programs for scientific research at the doctoral and post-doctoral levels under the Ministry of Education. The new structure of the Japanese Space Program reflected the post-Itokawa Japanese space policy, which welcomed international scientific and economic cooperation to ease Japan's space efforts, most notably with the United States.

[22] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[23] *Ibidem*.

Nevertheless, this new approach to space cooperation and NASDA's first talks with NASA for acquiring American technology for liquid-fuel rockets – more potent than Itokawa's solid-fuel missiles – found an impending obstacle in Article 9 of the Japanese Constitution. Indeed, the Diet feared a possible military drift of Japanese rocket science since all of NASA's missile series originated, in effect, from the Intercontinental Ballistic Missile (ICBM) Program. Therefore, a parliamentary resolution limiting Japan's Space Program to non-military purposes only and through non-military means was promulgated in 1969[24]. In addition, the US required NASDA officials and the Japanese government to sign a clause forbidding them from transferring launch technology to third parties.

Law No. 50, June 23, 1969, and NASDA's agreement with the US on rocket technologies institutionalized the partitioning of the Japanese Space Program both practically and theoretically. In truth, Japan developed two divergent, parallel approaches for its first 30 years of activity in space, although both conducted research for civilian purposes. While NASDA's programs followed the post-1966 Japanese space policy and quickly developed its fleet of liquid-fuel rockets following American blueprints, ISAS' scientists strongly opposed foreign-made technologies, opting to pursue Itokawa's dream for Japan to create homemade space probes. As a result, NASDA's share of Japan's space exploration budget grew to 80%, whereas ISAS eventually fell to acquiring less than 8% of it[25]. Moreover, the rivalry between the two Japanese space agencies increased academically, with ISAS literature not mentioning the works of NASDA's scientists and vice versa[26].

As ISAS conquered space, making Japan the fourth country in the world to orbit a satellite[27] around the Earth with the light-weighted *Ohsumi* being launched by a *Lambda* rocket from the Uchinoura Space Center in 1970, SAC expanded Japan's space cooperation by reaching a binding agreement with the European Space Agency (ESA) on a set of cooperative projects in 1972. Furthermore, in a further break with ISAS, the Japanese government and NASDA joined forces with Mitsubishi Heavy Industries and various American companies – such as the airframe manufacturer McDonnell-Douglas, and Honeywell – in the early 1970s to accelerate the production process of liquid-fuel rockets, as well as modern telecommunication satellites, therefore shifting the focus of the Japanese Space Program further into the telecommunications side[28]. Finally, in 1977, with a cost of 6 billion yen (approximately 42 million euros) for the American licensed liquid-fuel rocket N-I alone, NASDA successfully launched the first Japanese satellite from the new Tanegashima Space Center to reach

[24] J. C. Moltz, 2012.
[25] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[26] *Ibidem*.
[27] Japan came after, in chronological order, the USSR, the United States of America, and France.
[28] J. C. Moltz, 2012.

geostationary orbit, *Kiku 2*, making Japan the third country in the world to achieve this result. NASDA's accomplishment was particularly striking, for geostationary rotation allows a set of just three satellites placed in front of each other to observe the entire Earth up to approximately 70° north or south latitude[29]. Therefore, although *Kiku 2* only lasted six months before its last communication with ground control, Japan now considered itself among the few space powers of the first space age. Nonetheless, this loud political impudence was deemed inappropriate by a part of the Japanese scientific community, which was confident that NASDA wouldn't have orbited a satellite in such a difficult position as geostationary orbit without the licensed American launch system. The debate over Japan's extended dependency on the US for space exploration lasted well into the 1980s. In the meantime, SAC announced a revision of a 1978 15-year plan for Japanese human space activities, which in 1984 became linked to a Japanese space laboratory as part of the American Space Shuttle Program, with equipment operated by Japanese astronauts; and the participation of NASDA in a future American space station to study interstellar probes. NASDA further committed to collaborating with NASA and US enterprises by developing the H-I rocket, another licensed vehicle. The N-I, N-II, and H-I series proved essential for NASDA's missions during the 1980s, as Japan's first indigenous telecommunication satellites were all launched using the rockets mentioned above. Yet, the licensing arrangement between NASDA and the US cost Japan the prevention from marketing the H-I rockets commercially, partially leaving the Japanese government outside of the growing international space economy[30].

For its part, ISAS continued its development of Japanese scientific space programs through the 1980s, becoming an independent, national research institute and changing its name to the Institute of Space and Astronautical Sciences (also ISAS) in 1981. With a considerably restricted budget, ISAS introduced the made-in-Japan solid-fuel rockets *Mu*, a launcher for various satellite series, in the late 1970s and early 1980s. ISAS' most successful mission in these years consisted of a two-probe launch in 1985 to study the solar wind and the passage of the comet Halley - the two satellites, renamed *Sakigake* ("pioneer") and *Suisei* ("comet," also the Japanese name of the planet Mercury) once they were successfully launched from the Uchinoura Space Center, completed Japan's first deep space mission in less than a year, attracting substantial domestic public interest partly because of 16 television programs made on the topic by the Tokyo Broadcasting Service (TBS)[31].

Despite the absolute triumph of ISAS' scientific uncrewed deep space missions, the Japanese Space Program suffered from a severe crisis during the 1990s due to NASDA's scientific and international

[29]E. C. Dolman, Astropolitik – Classical Geopolitics in the Space Age. New York, Frank Cass Publishers, 2002.
[30] J. C. Moltz, 2012.
[31] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

issues and the 1997 Asian financial crisis, which stripped NASDA of most of its funding. NASDA's first incident occurred in 1994 when an H-II – the first liquid-fuel rocket wholly made in Japan – failed to send the *Kiku 6* satellite into geosynchronous orbit, beginning a run of ill-fated missions that put the Japanese Space Program on a significant setback for the rest of the 1990s. Moreover, the tragic explosion of the *Challenger* over Cape Canaveral on 28th January 1986 suspended the American Space Shuttle Program[32], leaving the first NASDA Space Shuttle astronaut Dr. Mohri Mamoru and the *Fuwatto*/*Spacelab J* mission on hold until September 1992, when NASA's Shuttle *Endeavor* finally brought Dr. Mohri in space for eight months[33]. As successful as the *Fuwatto* ("weightless") mission was, NASDA failed to get the first Japanese to space, for this primate went to TBS journalist Akiyama Toyohiro, who flew aboard the Soviet Shuttle *Mir* ("world" or "peace") in 1990[34]. Undeniably, Akiyama's flight cost immense embarrassment to NASDA and the Japanese government, which had to confront domestic critiques of Japan's space dependence on the US, and US indignation for a Japanese national broadcaster collaborating with the USSR. With the approval of SAC, NASDA attempted to overcome its excessive reliance on its participation in NASA's programs by publicly announcing in 1994 a research project for developing a Japanese reusable space plane, *Hope*. Yet, this project proved extraordinarily costly and was abandoned in the following years due to Japan's financial struggles in the late 1990s. Thus, Japanese astronauts kept flying aboard American Space Shuttles for the remainder of the decade.

During the same years, the Japanese government took a more proactive role in the international space arena, advocating for space cooperation in Asia at the Asia-Pacific International Space Year Conference in 1992 and establishing the still successful Asia-Pacific Regional Space Agency Forum (APRSAF) in 1993[35]. Although APRSAF officially saw the commitment of both NASDA and ISAS, more relevance was given to NASDA in a successful attempt to restore the international prestige of the Japanese Space Agency with Japanese-led technical training programs and regional data exchange. Nonetheless, APRSAF's popularity among the Asian scientific community in the late 1990s did not save NASDA from the H-II and H-IIA rockets' fiascos, leaving Japan with incomplete and over-expensive missiles impossible to market in international civil commerce.

The success of Japan-led space cooperation in the 1990s was again attached to the American Space Program, this time in the form of the Space Station plan. Initially announced by President Ronald

[32] The Shuttle *Challenger* exploded at the beginning of its tenth flight, killing its 7-members crew aboard; the incident most likely occurred due to record low temperatures at launch time, which caused severe technical issues to *Challenger*'s deployment system.

[33] As previously noted in this chapter, the 1984 modification of SAC's 15-year space plan linked all the Japanese crewed space missions to the success of NASA's Shuttle Program and the American Space Station *Freedom*.

[34] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

[35] J. C. Moltz, 2012.

Reagan in 1984 as the *Freedom* project for an American Space Station, the enterprise came to include Japan, ESA, and the Soviet - later Russian - Space Agency as prime partners of the US; however, *Freedom* went through a countless series of redesigns which delayed the launchings and exhausted NASA's budget for the project, causing frustration among the Japanese, who had already constructed their modules for the space station. Finally, the first module of the renamed International Space Station (ISS), the Russian *Zarya* ("sunrise"), was launched in 1998, and the Japanese Space Program could follow with its probe *Kibo* ("hope"), deployed by NASA in 2007. Progressively, *Kibo* has become the leading research center of the ISS, and Japan has partnered with the UN Office for Outer Space Affairs (UNOOSA) to enable developing countries to produce a cube satellite and have it deployed from the Japanese module of the ISS[36].

While developing *Kibo* and achieving other crucial scientific results with ISAS' deep space missions, the Japanese Space Program encountered motivating strategic challenges that triggered the Japanese government to change the configuration of Japan's space agencies and modify its national and international space policies.

Part three of this chapter will assess the reorganization of Japan's space program and the motivations behind this process.

***The Indian Space Program: Science & Technology for the People***

As Itokawa Hideo created the Japanese Space Program in the 1950s, Vikram Sarabhai (1919 – 1971) took India into the space arena during the same years. Sarabhai was the son of a wealthy and politically active family with progressive views and close ties to Mahatma Gandhi; an awarded physic and mathematician, Sarabhai returned to a newly independent India from the United Kingdom in 1947 and founded the Physical Research Laboratory (PRL), which Prime Minister Jawaharlal Nehru would officially inaugurate in 1954. Sarabhai shared with Nehru the idea of harnessing science to shape modern India by fusing ancient Indian scientific knowledge with the latest discoveries and technologies[37].

The right stimulus that triggered modern Indian research on rockets and missiles came, similarly to the Japanese experience, with the International Geophysical Year (IGY) in 1957-1958. After the Soviets launched *Sputnik-1* in 1957, Sarabhai consulted several international colleagues, including Itokawa Hideo, to determine the right path for an Indian Space Program and finally presented a proposal to the Indian parliament in 1961, advocating for a modest but highly socially focused project.

[36] https://www.unoosa.org/oosa/en/ourwork/access2space4all/KiboCUBE/KiboCUBE_Index.html lastly visited on 2nd December 2022.

[37] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

Notably, Sarabhai suggested developing an Indian satellite system to improve the diffusion of telecommunication and educative television formats in India's rural areas. As a result, the Indian government established the Indian National Committee for Space Research (INCOSPAR) under the Atomic Energy Authority in 1962 and nominated Sarabhai as its first chairperson. INCOSPAR first focused its research on sounding rockets at the Thumba Equatorial Rocket Launching Station (TERLS) under Sarabhai's directives, which included the development of indigenous technologies – a scientific approach he shared with Itokawa Hideo – and the non-participation of the Indian Space Program in the race to the Moon, due to INCOSPAR's precarious scientific and economic resources[38]. However, unlike Itokawa and ISAS, Sarabhai never refused to collaborate with the space powers and absorb knowledge from foreign and more advanced space programs. Indeed, India's first sounding rocket was launched from TERLS with the assistance of NASA and the French Space Agency (CNES) in 1963. Moreover, through Sarabhai's and Prime Minister Indira Gandhi's dedication, TERLS became an international equatorial sounding rocket facility under a United Nations agreement in 1968. Among INCOSPAR's new partners at TERLS were NASA, CNES, and the Soviet Hydro-meteorological Service, as a further testimony of India's non-alignment policy despite the pro-socialist tendencies of Nehru's and Gandhi's governments.

The first entirely domestically built sounding rocket was launched from TERLS in 1967; curiously, the name of India's first series of missiles, the *Rohini*, was suggested to Sarabhai by Itokawa Hideo during his service as an international advisor for the Indian Space Program in the late 1960s. From 1969, INCOSPAR used Indian-made propellants for its launchings while continuing to develop domestic rockets and hosting international lifts. Also, in 1969, the Indian government separated the national space program from the Indian Nuclear Energy Program. Moreover, it converted INCOSPAR into the Indian Space Research Organization (ISRO), which is still fully operative, guiding all Indian civil and scientific space activities nowadays. ISRO's detachment from the Atomic Energy Authority further encouraged the Americans and the Soviets to collaborate with the Indian Space Program, given the solely civil scopes of its missiles' launchings and satellite programs[39].

In fact, during the International Development Conference in Delhi in November 1969, the now chairman of ISRO Sarabhai unveiled one of the most important experiments of the Indian Space Program: SITE, the Satellite Instructional Television Experiment. In Sarabhai's vision, SITE was meant to be a part of a complex geosynchronous satellite-based telecommunication system able to reach even the most remote Indian villages. Through SITE and its expansions, people in the country's least developed areas would receive complete primary education and more insights on agriculture,

[38] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[39] J. C. Moltz, 2012.

family planning, hygiene, and simple technology. Sarabhai's project gained NASA's collaboration ever since its experimental phases. The American *ATS-F* satellite was planned to move to an appropriate orbit to send direct broadcasting to several underdeveloped Indian regions. Nippon Electric also provided transmitters and receivers to assist the United Nations Development Program (UNDP), which sponsored the SITE[40].

Indeed, Sarabhai's internationally recognized scientific authority as the first chairperson of the UN Conference On the Peaceful Use of Outer Space (COPUOS) in 1968 contributed to a global interest in ISRO's second extensive project, a remote sensing program to map India and prevent casualties caused by natural disasters[41]. Although Sarabhai and the Indian government had been advocating for the space independence of the developing countries, they were conscious of the necessity of international technological support for the Indian Space Program; therefore, ISRO initially relied on an American satellite, *Landsat*, and on data provided by the US National Oceanic and Atmospheric Administration (NOAA)[42].

ISRO's collaboration with international partners was not interrupted by Sarabhai's sudden passing in 1971, nor by the 1974 Indian nuclear test[43] – while the latter event certainly caused concern among the Nixon and the Ford administrations. Moreover, in 1972, despite ISRO's continuous efforts to develop more powerful rockets than the *Rohini* series, India reached a beneficial agreement with the Soviet Union to access Soviet launchers for its satellites. In exchange, the Soviets could access Indian ports with their space-tracking ships. In addition, other critical international associates, such as Japan, the UK, West Germany, and France, continued cooperating with the Indian Space Program for scientific and commercial purposes.

These fruitful exchanges allowed ISRO to pursue Sarabhai's original projects. Between 1975 and 1976, the SITE Program entered its operative phase by moving NASA's experimental *ATS-6* satellite over India, with the television programming being uplinked from the Ahmedabad ground station. SITE reached extreme success in all the villages hit by its broadcasting services, and Indian social scientists positively evaluated its cultural effects[44]. After SITE, with similar purposes, came STEP or Satellite Telecommunications Experimental Project (1977 – 1999) with the European satellite *Symphonie*. Meanwhile, ISRO developed the first Indian satellite, *Aryabhata*, launched by the USSR in 1972 and dedicated to studying stellar X-rays, neutron and gamma radiation from solar flares, and

[40] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[41] *Ibidem.*
[42] J. C. Moltz, 2012.
[43] Officially known as *Operation Smiling Buddha*, the detonation of a Pokhran-I bomb on May 18, 1974, was the first successful Indian nuclear test (http://nuclearweaponarchive.org/India/IndiaSmiling.html lastly visited on 10th December 2022).
[44] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

radiation fluxes in Earth's ionosphere. *Aryabhata* worked until 1980 and was followed by its backup models, later renamed *Bhaskhara-1* and *2*, in 1979 and 1981. Both satellites were launched by Soviet rockets from Soviet launch sites[45].

ISRO's first home-launched satellite was the *Rohini-1*, named like India's first sounding rockets series. *Rohini-1* was orbited in 1980 from the Sriharikota Island launch site, after several unsuccessful attempts, by an indigenous SLV rocket developed under the direction of Abdul Kalam (1931 – 2015), later President of India from 2002 to 2007. The *Rohini* satellite series was orbited during the 1980s and boosted India's scientific prestige globally, as well as ISRO's ties with Western space agencies such as CNES and the German Aerospace Agency (DLR).

Concurrently, the Soviet invasion of Afghanistan in 1979 and subsequent American cooperation with Pakistan led Indira Gandhi's government to side with Moscow over the conflict. This political shift prompted ISRO to accept the Soviet offer to train and fly India's first and thus far only astronaut, Aviation's Squadron Leader Rakesh Sharma, to the *Salyut-7* space station in 1984. The USSR also orbited the first generation of Indian Remote Sensing Satellites (IRS) using *Vostok* launchers between 1988 and 1991. Even so, in the early 1980s, the Reagan administration presented ISRO with the possibility for an Indian astronaut to participate in a space shuttle flight as a payload specialist and the offer to launch India's *Insat-3* communication satellite. Unfortunately, this cooperative effort was voided by the explosion of the *Challenger* in 1986, which further estranged NASA and ISRO.

India launched the *Insat-3* satellite series with French rocket technology in the first decade of the 21st century. The *Insat-3* satellite was the result of the technological progress made by ISRO since the above-mentioned first IRS series; during the 1980s and the 1990s, the Indian Space Program was dedicated to developing more advanced remote sensing systems as well as more efficient and wholly indigenous rockets to launch the upcoming IRS series. In the 1990s, American and European missiles launched the first and second series of *Insat* satellites. The INSAT system allowed Indian telecommunications to be available for ninety percent of the national population, with India triumphally entering the information technology sector of the international space economy. Moreover, with the *Insat-3A* and *Insat-4* satellites, ISRO provided extensive telemedicine development and an efficient alarm system against natural disasters and extreme climate events for villages and rural areas[46].

Simultaneously, ISRO's studies on indigenous rocket technologies have been paired since the second half of the 1980s with the work of the Defense Research Development Organization (DRDO), also initially guided by Abdul Kalam. Unlike ISRO, DRDO was a military institution whose primary

[45] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[46] *Ibidem.*

objective was the creation of ICBMs. For this reason, resources and personnel were borrowed from ISRO's civil and scientific programs to develop India's first ICBM, the *Agni-1*, successfully tested in 1989[47]. Nonetheless, ISRO continued its research under Kalam's guidance, and the Augmented Space Launch Vehicle (ASLV) orbited its payload in its final flight in 1994. After the ASLV, during the 1990s, ISRO developed the Polar Satellite Launch Vehicle (PSLV) following blueprints of the American *Delta* and the Japanese N-II rockets. However, DRDO's expansion in the missile sector triggered Washington, and consequently, Tokyo, to cease technological cooperation with India[48].

The collapse of the USSR in December 1991 caused further damage to the Indian Space Program, which now could not rely on Soviet technologies nor Soviet expertise. Furthermore, the same year's grave domestic economic crisis led the Indian government to privatization of key industrial sectors and severely cut state spending. The Department of Space created the Antrix Corporation in 1992 to prevent privatizing space technologies. Despite these complications, ISRO successfully developed and tested the PSLV, which by 1999 became a globally appreciated commercial launcher for polar orbit[49].

ISRO experienced additional bureaucratic and diplomatic challenges in the early 1990s to develop a missile to put a payload into geostationary orbit. Indeed, the George H. W. Bush administration sanctioned the Russian Space Agency Glavkosmos in 1992 over its agreement with India on sharing rocket technology, barring American firms from cooperating with the two space programs. The 1993 Clinton-Yeltsin summit in Vancouver eventually solved this inconvenience, allowing Glavkosmos to send to ISRO completed rocket boosters for geostationary launchers but not their blueprints. Therefore, the first Geostationary Satellite Launch Vehicle (GSLV) series rockets used Russian upper-stage engines, orbiting the *Gramsat* and *Edusat* educational satellites in 2001 and 2004 from Sriharikota. The first orbital test launch of a completely Indian-made GSLV, the Mark III, was successfully conducted by ISRO in 2017 from the Satish Dhawan Space Center[50].

Although the Indian Space Program was antagonized by the George H. W. Bush and the Clinton administrations, the 1990s still saw fruitful international agreements for ISRO and DRDO, particularly with Israel, which first cooperated with India in weapons development in 1992, then shared with the Indian government its satellite reconnaissance technology[51].

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[47] J. C. Moltz, 2012.

[48] *Ibidem.*

[49] Among the satellites launched by the PSLV are South Korea's *Kitsat-3* and Germany's *Tubsat* (J. C. Moltz, 2012).

[50] https://web.archive.org/web/20170618224933/http://economictimes.indiatimes.com/news/science/indias-bahubali-gslv-mk-iii-lifts-less-luggage-than-lighter-rockets/articleshow/59178611.cms lastly visited on 11th December 2022.

[51] J. C. Moltz, 2012.

A US-Indian rapprochement came after the terrorist attacks on the United States in September 2001 due to an unprecedented American strategic shift towards India. Regarding space cooperation, the two countries established the Indo-US High Technology Cooperation Group in 2002, which prepared the ground for the Next Steps in Strategic Partnership (NSSP) in 2004. In addition, the George W. Bush administration now looked favorably at DRDO's research, and the US and India started military-to-military talks for cooperation in the nuclear energy sector.

In the same years, India's space cooperation in the scientific and commercial sectors reached Europe and Asia. This idea blossomed among the Indian government and ISRO to partly answer crucial regional strategic and commercial challenges for the Indian Space Program, which emerged with the advent of the second space age in 2003 and further prompted DRDO's activities.

India's new interest in military space and Indian space security policies to assess current Asia's space race will be the object of the following section.

***JAXA and ISRO: Facing a Rising Dragon***

At the beginning of the 21st century, the international relations of outer space underwent a substantial evolution. During the first space age in the years of the Cold War, the United States and the Soviet Union led the scramble for space and the subsequent impressive scientific and technological progress. However, other actors in Europe and Asia emerged with advanced space programs, establishing a growing international space community. As narrated through this chapter, Japan and India came into the spotlight as Asian regional space powers through the 1970s and the 1980s, despite several setbacks and a progressive reformation of the Japanese and the Indian space programs. However, the rapid development of the Chinese Space Program and the concurrent rise of the People's Republic of China as a regional power in the early 21st century activated a decisive change in Japan's traditionally S&T-oriented space program, with a complete transformation of the Japanese space institutions and, more importantly, Japanese space policies and priorities. Simultaneously, India also completed reorientating its space program, which had already changed its focus from purely civil and scientific objectives to more strategic military development since the establishment of DRDO's missile program, as stated in the previous section. For the remainder of this chapter, the Japanese and Indian space policies for the new millennium will be analyzed.

As formerly mentioned, since the 1969 Diet Resolution, Japan's policy for space development accepted the pacifist spirit of the 1946 Japanese Constitution. This translated to the development of space-related Science Technology (S&T) for entirely peaceful purposes by Japanese space agencies NASDA and ISAS and since 2003, the Japan Aerospace Exploration Agency (JAXA), under the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Thus, Japan also shaped

its international space relations following the principles of the 1969 Diet Resolution, forging valuable partnerships with the United Nations and a wide range of countries, keeping these agreements strictly on scientific and commercial cooperation. However, such precondition, which the Lyndon Johnson administration had favored to protect American ICBMs blueprints and technologies indirectly, caused Japan not to be considered a strategic partner in space by the US for more than thirty years after adopting the Resolution. The changes in Japan's policy for space development were triggered by two main events which started the second space age: the 2003 *Shenzhou-5* mission, which made the People's Republic of China the third country capable of independent crewed space missions after Russia and the US, and, more importantly, the first Chinese successful direct-ascent antisatellite (ASAT) weapon test, which happened in 2007 and destroyed the defunct *Fengyun-1C* weather satellite with a derivative of the DF-21C ICBM[52]. The sudden change in Chinese space posture prompted the Japanese Diet to issue the 2008 Basic Space Law (henceforward, 'the 2008 Law'), which substantially reverted the 1969 Resolution. Indeed, Article 3 and Article 14 of the 2008 Law openly cite international peace and security and Japan's national security among the objectives of the Japanese Space Program[53].

Additionally, the 2008 Law allowed the establishment of the Strategic Headquarters for National Space Policy (SHNSP) within the Cabinet Office and the creation of the Committee on National Space Policy (CNSP) in 2012, also under the Cabinet Office. The SHNSP, which comprises all cabinet ministers with the Prime Minister as its director-general, is responsible for building a comprehensive national space policy. The CNSP, a scientific council guided by the bureaucratic National Space Policy Secretariat (NSPS), studies pivotal issues regarding space policies and the peaceful utilization of space, including guidelines for expense estimates. Following CNSP's advice, the Japanese government formulated the first Basic Plan on Space Policy in 2009, then implemented it in 2013 and 2015. The Basic Plans progressively changed the relationship between JAXA and the Ministry of Defense (MOD)/Self-Defense Force (SDF), which grew more vital, particularly during Abe Shinzō's last administration (2012 – 2020)[54]. In fact, in 2014, JAXA and the Acquisition, Technology, and Logistic Agency (ATLA), an independent structure affiliated with MOD, became partners, with JAXA personnel being borrowed by MOD after the agreement.

Moreover, in 2017 MOD and JAXA signed an accord for general cooperation on space situational awareness (SSA) systems, which would provide Japan with constant surveillance of space debris and suspicious satellites. Furthermore, in 2020, the Air Self-Defense Force (ASDF) established a

[52] H. Yoshimatsu, Japan's Asia Diplomacy – Power Transition, Domestic Politics, and Diffusion of Ideas. Singapore, Springer Nature, 2021.
[53] Basic Space Law (Law #43, 2008), effective from 27 August 2008.
[54] H. Yoshimatsu, 2021.

foundation for creating an ASDF space unit in coordination with JAXA. These fundamental changes, together with the development of Japan's GPS, the Quasi-Zenith Satellite System (QZSS), for improved positioning accuracy in the Asia-Pacific region, have enhanced Japan's strategic capabilities in space and have transformed it into a tactical, regional space partner for the United States in Asia. Japan's proactive attitude during Abe's 2012-2020 administration confirmed this new Japanese posture when the Japan-US Comprehensive Dialogue on Space annual conference and the Japan-US Space Security Dialogue were established and based on this institutional dialogue, the Japanese and the US governments concluded two agreements between 2013 and 2014 on information sharing and the start of a two-way SSA, and the establishment of the Japan-US Space Cooperation Working Group in 2015 for space-policy-related consultations between the two countries. Besides, between 2015 and 2018, Japan joined multilateral table-top exercises on SSA and cybersecurity organized by the US Strategic Command and the American Air Force, increasingly strengthening space cooperation and the role of JAXA as an essential bastion of the Japan-US security alliance[55].

For its part, the Indian Space Program was already mildly tied to India's nuclear energy program and the military since the establishment of INCOSPAR in 1962 and the creation of DRDO's missile program in the 1980s. However, similarly to Japan, the 2007 Chinese ASAT test refocused Indian attention on military space capability and a more proactive role of India in the international space arena. In 2008, the Integrated Space Cell was established within the Integrated Defense Service Headquarters to coordinate India's military space research and activities with ISRO and develop operational command capabilities for future strategic space missions. Creating the Integrated Space Cell was supposed to strongly impact India's traditional space policy, which advocated for the non-weaponization of space and the use of space for peaceful purposes[56]. Indeed, ISRO has engaged in its role as the Indian Space Agency with a bolder attitude, as demonstrated by the new definition of 'human security' proposed by ISRO, which amplifies the notion from its military origins and associates it with a broader range of threats, including the ones emanating from poverty and environmental degradation. This led to a new focus of the Indian Space Program on the distributional dimension of space exploration, generating issues with the United States and the other space powers on the United Nations Debris Mitigation Guidelines in 2007, with the Indian delegates accusing the US of cultural imperialism in Space Law.

Nevertheless, Indian intentions to create an anti-Chinese space deterrence system attracted the Obama administration in 2010, and the President of the US removed ISRO from the list of organizations requiring a US special license to engage in bilateral trade or other operations during his visit to India

[55] H. Yoshimatsu, 2021.
[56] J. C. Moltz, 2012.

that year[57]. Concurrently, India has improved its space communications and surveillance capabilities, with the *Cartosat-2A* satellite and its Israeli synthetic-aperture radar technology operating under the Indian Defense Intelligence Agency since the early 2010s and the completion of India's GPS, the NavIc System, between 2013 and 2018. These actions have been taken following the Defense Space Vision 2020, a military document that also envisioned a satellite for each of the three branches of the Indian Armed Forces provided by ISRO. Still, despite India's Defense Space Vision 2020, the Indian government has failed to promote a coherent national space policy due to the lack of proper national legislation on space exploration. This confusion among Indian space institutions has been caused by fierce bureaucratic competition between DRDO, the Department of Atomic Energy (DAE), the Prime Minister's Office, and the Indian military[58]. Indeed, both DRDO and DAE aim to reach further political independence from both civil and defense institutions to have more influence in shaping India's nuclear policy, indirectly compromising Indian space governance given that ISRO's missile program has been increasingly tied to DRDO's research on the *Agni* rocket series since the early 2000s[59]. More recently, Prime Minister Narendra Modi promised a new Indian policy for space development during his inauguration of the Headquarters of the Indian National Space Promotion and Authorization Center (IN-SPACe) on 10th June 2022[60]. Yet, this new national space law does not seem to include any strategic element, as it targets the emergent Indian private space sector.

***Conclusions***

Japan and India are the first Asian countries to have reached the status of regional space powers. In effect, both national space programs saw their origins during the 1950s due to the visions of the scientists Itokawa Hideo and Vikram Sarabhai, who believed that Japan and India needed to develop indigenous space technology capabilities. Itokawa and Sarabhai also shared the idea of creating national space programs solely for scientific and civil purposes. Nonetheless, while the Japanese Space Program grew inspired by Itokawa's scientific spirit and the pacifist Constitution of 1946, the Indian Space Program was gradually associated with ICBM development and the creation of DRDO's missile program in the 1980s. The two space programs assumed similar postures again after 2007, when the People's Republic of China officialized its first successful ASAT test. Still, the new

[57] J. C. Moltz, 2012.
[58] F. O'Donnell, H. V. Pant, Evolution of India's Agni-V Missile: Bureaucratic Politics and Nuclear Ambiguity. In: *Asian Survey*, 2014.
[59] The 2007 Chinese ASAT test indeed prompted this renewed collaboration between ISRO and DRDO; however, India has also been triggered by the establishment of the Pakistani Space Program with Beijing's help and constant cooperation (R. Q. Ahmed, M. Arif, Space Militarization in South Asia. In: *Asian Survey*, 2017).
[60] Press Information Bureau of the Government of India, 10th June 2022 (https://www.mha.gov.in/sites/default/files/HMInSpace.pdf ).

Japanese policy on space development appears coherent and specific to Japan's strategic needs. In contrast, India needs to elaborate an official space policy with tactical characteristics.

These different approaches to space deterrence are found in Japan's more assertive Asian Diplomacy under Abe Shinzō's impulse, which has encompassed India as the leading strategic partner for Japan in the "Indo-Pacific" area, with the Indian government left to adhere to Abe's policies simply, despite Modi's efforts in creating an original foreign policy. Therefore, the objectives of the following chapter will be the Japanese strategy for a Free and Open Indo-Pacific and India's subsequent Act East Policy under Narendra Modi.

## *Chapter 2: Strategies for the "Indo-Pacific"*

As was briefly mentioned in the previous chapter, the new grand strategy for a Free and Open Indo-Pacific which emerged during Abe Shinzō's second, third, and fourth mandate as Japan's Prime Minister (2012 – 2020), is crucial in the development of Indo-Japanese space cooperation to present days. Indeed, Abe's 2012 version of the Free and Open Indo-Pacific (FOIP 2.0) program is still the blueprint of Japanese diplomatic efforts to achieve a favorable regional balance. In this sense, Manjari Chatterjee Miller of the Council on Foreign Relations (CFR) noted that India joined Abe's vision as FOIP's protagonist with Japan, becoming a more assertive actor in global politics under Narendra Modi's Administration in the last decade[61]. Thus, this chapter aims to analyze Japan's FOIP strategy in its developments from Abe Shinzo's first administration in 2006 – 2007 until recent years and Narendra Modi's Act East Policy, which in the present work is considered a derivation of Abe's second and final rendition of FOIP.

However, albeit Japan and India picture themselves as the leading actors in the "Indo-Pacific" setting, other regional powers have developed their geopolitical definitions of the "Indo-Pacific" region, as well as their regional blueprints, which have influenced the relations between Japan and India and will continue having an impact in the future. Therefore, before investigating Japan's and India's grand strategies, a brief examination of the term "Indo-Pacific" and its most significant strategic definitions will be offered to frame better FOIP and the Act East Policy from a geopolitical perspective.

Finally, the concluding section of the present chapter will be dedicated to the United States' "Rebalance to Asia" and the recent developments of Washington's China policy. These doctrines are highly intertwined with the Japanese and Indian political stances.

### *Geopolitics and the Indo-Pacific: an unfolding reality*

In the last two decades, the concept of "Indo-Pacific" has been increasingly used in geopolitical and strategic disquisitions to indicate an area that combines the Indian and the Pacific Oceans into a sole frame[62]. Nonetheless, the origins of this term date back to the 1920s, when German general and geopolitician Karl Haushofer (1869 – 1946) first indicated a future resurgence to power in the Asian continent under the Chinese and the Indian civilizations, which at the time were separated by British-protected independent Tibet[63]. Indeed, Haushofer centered the peculiarity of the "Indo-Pacific" region on what the German author perceived as the convergence of the Chinese and the Indian cultures

[61] https://www.cfr.org/blog/indias-special-relationship-abe-shinzo lastly visited on 5th February 2023.
[62] Gurpreet S. Khurana, What is the Indo-Pacific? The New Geopolitics of the Asia-Centered Rim Land. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.
[63] Hansong Li, The "Indo-Pacific": Intellectual Origins and International Visions in Global Contexts. In: *Modern Intellectual History*, 2022.

among the peoples of Southeast Asia, which in the 1920s were still under Western colonial domination. Using these cultural ties and oceanography as the main justifications of his political theories, in the 1920s, Haushofer predicted the decolonization of the "Indo-Pacific" area and the affirmation of shared political and strategic aims among the "Indo-Pacific" people, guided by Indian and Chinese republican élites with a German philosophical and juridic background[64]. Formulating his theories after the Paris Peace Conference (1919 – 1920) and during the Weimar period (1918 – 1933), Haushofer infused his speculations on the geopolitical concept of the "Indo-Pacific" with adversity for the Anglo-American maritime domination in the area and the French colonization of Southeast Asia, therefore emphasizing the similar natural history of the Indian and the Pacific regions and the cultural and linguistic ties between the "Indo-Pacific" populations, against the unfamiliarity of the Anglo-Saxon and French political and philosophical control. Despite the heavily symbolic value of Haushofer's "Indo-Pacific" theory, it is worth highlighting that the German geopolitician rejected the traditional strategic dichotomy of terrestrial-versus-maritime powers – which is typical of the Anglo-American political and geographical schools - and classified China and India as peninsular or midway powers with maritime nomadic political and cultural origins, in a way transforming both States in modern-era Herodotean Athens[65].

After being coined by Karl Haushofer, the term "Indo-Pacific" achieved popularity among Australian scholars, who incorporated it in Canberra's two-oceans strategic policies and adapted Haushofer's speculations to Australia's geopolitical status as a maritime nation; nonetheless, there has not been any formalization of an Australian version of the "Indo-Pacific" theory until the beginning of the 21st century, when the establishment of the East Asia Summit (EAS) triggered Canberra to pursue a more proactive posture in the area[66]. In this context, Australia's strategy for the "Indo-Pacific" – the first to be formalized in official documents, diverged entirely from the German 1920s conceptualization, for it included the United States as one of the leading actors in the region balancing a rising People's Republic of China (PRC). In addition, Canberra considers Japan an essential strategic partner in the "Indo-Pacific," whereas Haushofer's theorization deemed it less influential, if not a minor player[67]. For its part, India continues to play a central role in Australia's vision of the "Indo-Pacific." In this case, New Delhi is the first recipient of Canberra's foreign development investments (FDIs) in the infrastructure sector[68]. Indeed, Australia's recent connection to India has been predominantly

[64] Hansong Li, 2022.
[65] *Ibidem*.
[66] Gurpreet S. Khurana, 2019.
[67] Hansong Li, 2022.
[68] J. Hemmings, Australia's Economic, Infrastructural and Security Objectives in the Indo-Pacific. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.

economic considering Indian Prime Minister Modi's refusal to initiate strategic cooperation with Canberra, which therefore could not send its troops to the US-Japan-India joined naval exercise in Malabar in 2018[69]. Mori's veto on security partnership led to the definition of an Australian strategy for the "Indo-Pacific" with predominantly ideological and economic characteristics. Particularly after the unveiling of PRC's Belt and Road Initiative (BRI) in 2013, Australian annual Defense White Papers have insisted on the preservation of democratic and liberal values in the "Indo-Pacific" area, linking the surviving of the San Francisco system against China's assertive posture to Canberra's FDIs in the region, with considerable attention to the ASEAN Member States. Hence, Australia's concept of the "Indo-Pacific" widely differs from Haushofer's original formulation.

Beijing initiated its strategic plan for the "Indo-Pacific" region in 2012 principally to prevent the PRC from being excluded from the maritime routes in the Indian Ocean, which are vital for the Chinese economy. The Chinese government has yet to formulate an official geopolitical definition of the "Indo-Pacific" region; nonetheless, Chinese scholars have offered two divergent visions of the significance of the "Indo-Pacific" concept for Chinese politics. On the one hand, the first analysis recommends that the PRC should cooperate with Japan, India, and the United States in promoting strategic objectives and norms for the "Indo-Pacific" region so that Beijing could benefit from the existing regional order[70]; on the other hand, the second evaluation suggests that the "Indo-Pacific" theory has been used by Japan and the US in explicit aversion to China, to elevate India to the detriment of the PRC[71]. Concretely, Xi Jinping has developed a Chinese strategy for the "Indo-Pacific" under three different but interrelated blueprints, namely, the String of Pearls in the Indian Ocean Region (IOR), China's assertive stance in the territorial disputes in the South China Sea with the Nine Dash Line and the East China Sea, and the Belt and Road Initiative (BRI). As these three frameworks all sprout from growing Chinese energetic and economic needs, the String of Pearl and the Nine Dash Line strategies equally serve the PRC's "1.5 war" doctrine, which revolves around building the military capability needed to withstand one significant conflict on one front – which in the People's Liberation Army's (PLA) perception could be either in the South China Sea or in the East China Sea against the US and its Asian allies, while containing the fighting operations arising on the other[72]. In this sense, Beijing has used BRI to build essential infrastructure across the String of Pearl and the Nine Dash Line territories, further strengthening the Chinese civil and possibly

[69] Although Australia became India's fourth strategic partner in Malabar exercises in 2020, India-Australia relations continues to lag for what concerns regional security (M. J. Green, Line of Advantage. Japan's Grand Strategy in the Era of Abe Shinzō. New York, Columbia University Press, 2022).

[70] M. Zhao, The Emerging Strategic Triangle in Indo-Pacific Asia. In: *The Diplomat*, 2013.

[71] Zhao Zebian (2013) via Gurpreet S. Khurana, 2019.

[72] You Ji (2016) via S. Miracola, The Indo-Pacific as a New Infrastructural and Economic-Trade Area: A Real Competition to BRI?. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.

military presence in the "Indo-Pacific" area. However, Xi has not deemed BRI utterly incompatible with Japan's FOIP 2.0 and India's Act East Policy, at least for what concerns mutual economic-trade benefits.

Lastly, mentioning the relationship between ASEAN and the "Indo-Pacific" framework is significant. Strategically, the ASEAN countries find themselves at the center of Haushofer's original theorization of the "Indo-Pacific" and all the present-day tactical constructions regarding this geopolitical area. Therefore, during the last two decades, the ASEAN member states have felt pressured to either take a position in the "Indo-Pacific" framework or to adequate their foreign policies to avoid a total eclipse of the ASEAN system. Indonesia has been particularly supportive among the ASEAN countries that openly adhere to the "Indo-Pacific" structure. For example, in 2013, Indonesia proposed an "Indo-Pacific wide treaty of friendship and cooperation" with the countries of East Asia, India, and Australia. Although such a proposition proved fruitless, in 2014, Indonesian President Joko Widodo reaffirmed the nation's commitment to the "Indo-Pacific" framework, noting that the Indonesian archipelago virtually controls all the most critical maritime communication points between the Indian Ocean and the Pacific Ocean.

Despite indirectly unfolding from Haushofer's ethnically and continentally centered 1920s geopolitical theory, all those mentioned above national strategic plans for the "Indo-Pacific" construction concentrate on the institutional and economic aspects of regional politics, which have been shaped during the second half of the twentieth century by Japan. Indeed, Japanese former Prime Minister Abe Shinzō was the first to reintroduce and popularize the "Indo-Pacific" geopolitical concept by proposing what would be later called the "QUAD" in his 2006 political manifesto *Toward a beautiful country*[73]. Furthermore, Abe further developed Japan's new grand strategy reframing multiple factors and contingencies which have tied Japan to the "Indo-Pacific" framework since the beginning of the last century, which will be explored in the next section along with Japan's internal balancing reforms for a Free and Open Indo-Pacific.

### *Japan's Grand Strategy for a Free and Open Indo-Pacific*

Abe Shinzō's rendition of the modern Japanese blueprint for the Indo-Pacific spurred from strategic necessity. If the Indo-Pacific maritime ways have always been Japan's chessboard for foreign politics, Japanese policymakers conserved a geographical perception of Asia that did not include India until the beginning of the 21st century. Michael J. Green argues that this conceptual map derived from Hachirō Arita's Greater East Asia Co-Prosperity Sphere and was followed to direct Japanese FDIs

[73] M. J. Green, 2022.

and regional institution building during the Cold War period[74]. However, what prompted a fundamental change in Japan's regional perspective was China's appropriation of the East Asian framework in the early 2000s. The PRC applied similar foreign policies to the region that Japanese policymakers had sponsored during the second half of the 20th century, yet to rebalance Western predominance in the international order[75]. Simultaneously, China's growing military assertiveness in the East and South China Seas and North Korea's nuclear threat actively rewired Japanese foreign politics to include India and search for other external balance in Asia with Australia and the United States, despite the latter's unclear policy toward the region at the time. Hence, the development of the "Indo-Pacific" framework by Abe and his supporters in the Liberal Democratic Party (LDP) essayed Japan's needs to reshape international relations in Asia for the 21st century.

Abe's Free and Open Indo-Pacific policy is not entirely detached from the past. Indeed, at the heart of Japan's modern grand strategy is the concept of line of advantage or *riekesen*, first introduced in Japanese military theory by Yamagata Aritomo in 1890[76]. Initially, *riekesen* indicated a maritime-turned-continental containment strategy against the Western powers and the Russian Empire and was the theoretical basis for the above-mentioned Greater East Asia Co-Prosperity Sphere, which had its line of advantage in continental China. When advocating for the FOIP strategy, Abe never mentioned *riekesen*. Nonetheless, Japan's "Indo-Pacific" framework draws a new geopolitical line of advantage, which returns to its maritime origins but is built on economic cooperation and shared political values within regional actors. Indeed, Abe's former Deputy National Security Advisor Kanehara Nobukatsu implicitly confirmed this reformulation of *riekesen* when expressing Japan's responsibility to make strategic decisions today to defend the liberal order, given the "tragically wrong choices"[77] that the Japanese Empire made in the 1930s.

Geographically, establishing a line of advantage appears necessary to Japan due to its characteristic as a narrow maritime State, with less terra firma and navigable waterways than other powerful island countries, such as the United Kingdom. This configuration creates an insufficiency of resources, which, together with Japan's archipelago's relatively wide distance from the continental territory, contributed to Japanese strategic vulnerability to isolation. In fact, since the Meiji Restoration, the economic relationship between Japan and Southeast Asia deepened to grant the growing Japanese industrial sector a market for its goods and a supply of raw materials that were difficult to obtain.

[74] M. J. Green, 2022.

[75] Although the PRC adhered to Western-led liberal institutions such as the WTO at the beginning of the 21st century, China became progressively critical of the liberal international order and advocated for multipolarism in international forums, thus proposing new regional conventions such as the Boao Forum for Asia in 2001, which aimed to substitute the Davos Forum.

[76] M. J. Green, 2022.

[77] Kanehara (2010) via M. J. Green, 2022.

Fukushima Yoriko puts these commercial needs on the Japanese side in relation to the expansion of the 1930s 'Greater East Asia Co-Prosperity Sphere' policy and indicates the use of geopolitical theories, such as Royama Masamichi's 'regionalism' and Haushofer's shared origins of all the peoples of the "Indo-Pacific" area to justify Japanese imperialism in Asia during the 1903s and the 1940s, given that both postulations promoted regional associations instead of an Anglo-Saxon-led international order[78]. Furthermore, Komaki Saneshige's *tennoism* and Ezawa Joji's geographical classification based on human predominance over nature were also used by Japan to justify its aggression against other Asian States[79]. Besides, FOIP's line of advantage also blooms from Japan's unique geographical conditions. Yet, it relies on a more comprehensive geopolitical panorama and Japan's economic and infrastructural reliability in the "Indo-Pacific" region.

As indicated above, Japan's prime opponent in Asia is the People's Republic of China. Since the late 19th century, Chinese territory became the ultimate target of Yamagata's *riekesen* and Japanese military conquest. In 1951, the Yoshida Doctrine emerged in newly-democratic Japan's foreign policy to establish friendly ties with Asia – and the PRC – under Article 9 of the Japanese 1947 Constitution. Remarkably, at the time, Japanese Prime Minister Yoshida Shigeru believed that history would eventually draw China to seek Japanese economic support and guidance in modernization and that, in turn, Japan would gain regional recognition for its sensational economic achievements[80]. In the late 1970s and early 1980s, the PRC would then be one of the "flying geese" following Japan in the new Asian development.

Nonetheless, China's economic reforms under Deng Xiaoping and his successors and its growing military assertiveness drastically changed Japanese policymakers' perception of national threats. Moreover, Chinese 1994 successful nuclear test, the Taiwan Strait 1995-1996 military crisis, and the PRC's growing ambitions in the East and the South China Seas, as well as its extending presence in IOR, induced an economic and fierce diplomatic rivalry between the PRC and Japan, further inflamed by unsettled historical issues from the time of the Japanese domination in China (1937 – 1945). Such predominantly political divergence induced Abe Shinzō, during his first term as Japanese Prime Minister between 2006 and 2007, to propose the first version of the Free and Open Indo-Pacific

[78] Royama's 'regionalism' derived from his strong critique of the League of Nations after the Washington Conference (1921-2), where the Western powers denied the Japanese Empire its interests in China. Royama promoted a capitalist 'regionalism' among the East Asian countries to better 'resolve conflicts' that the League of Nations had failed to assess correctly. As mentioned above, in incorporating Royama's 'regionalism' in the 'Greater East Asian Co-Prosperity Sphere' policy, the Japanese government integrated it with Haushofer's theories on the "Indo-Pacific" populations, also indicated in the first part of the present chapter. However, Tokyo chose isolationism instead of capitalism, which was Royama's preferred economic system (Y. Fukushima, Japanese Geopolitics and Its Background. What is The Real Legacy of The Past? In: *Political Geography*, 1997.

[79] *Ibidem*.

[80] Yoshida's convictions and American foreign politics toward Asia led Japan and the PRC to sign the 1978 Sino-Japanese Treaty of Friendship and Cooperation (M. J. Green, 2022).

framework, later denominated FOIP 1.0. Notably, in his 2006 political manifesto, Abe highlighted the importance of strengthening Japan's security partnerships with Australia and India, cultivated by his predecessor Koizumi Junichiro[81], and elevating the informal Japan-United States-Australia-India Quadrilateral Talks (QUAD) to a leaders' summit on defense in the "Indo-Pacific" region. Furthermore, India became the center of Abe's FOIP 1.0 agenda, emerging as the first beneficiary of Japan's official development assistance (ODA) in 2007.

Additionally, ties between Tokyo and New Delhi intensified when Japan participated for the first time in the Indian naval exercise at Malabar in 2006. Besides, Abe explicitly connected India to Japan's new strategic Asian framework in August 2007 in a speech before the Indian Parliament, stating the need to enhance security and geo-economic connections between the Pacific and the Indian Oceans, considering shared political values between Tokyo and New Delhi and for a peaceful future in Asia. Indeed, the leading factor for FOIP 1.0 was the convergence of Japanese and Indian strategic interests facing the PRC's growing political and military assertiveness, which would compromise Tokyo's Sea Lines of Communication (SLOCs) from the Persian Gulf through the Strait of Malacca and into the South China Sea, as well as New Delhi's predominance in the Indian Ocean[82].

Abe's first conception of the Free and Open Indo-Pacific framework further comprehended Australia as one of the four members of the QUAD and Japan's third security partner in the region, after Washington and New Delhi. However, as relations between Australia and India complicated Canberra's participation in QUAD's strategic exercises, Abe opted to elevate Japan's bilateral partnership with Australia by issuing a 'Japan-Australia Joint Declaration on Security Cooperation' with Canberra's then-Prime Minister John Howard in 2007. A similar comprehensive work plan for defense cooperation was then signed by Abe's Foreign Minister Asō Tarō with India later that year.

Completing FOIP 1.0 theorization, in 2006, Asō announced the 'Arc of Freedom and Prosperity,' which was supposed to be the diplomatic and logistic branch of Japan's new grand strategy to connect the QUAD with the rest of the Asian continent, creating a perimeter around China and the Russian Federation. However, despite being based mainly on Japan's FDIs in East Asian countries and supposedly shared political values between the QUAD members and the other participants, the Arc appeared to be a modern rendition of the 'Greater Asia Co-Prosperity Sphere,' thus catalyzing diffidence for FOIP 1.0 among the ASEAN States and Washington's National Security Council. Furthermore, Beijing perceived both the QUAD and the Arc as Group 3 minilateral security

[81] During his mandate as Japan's Prime Minister (2001 – 2006), Koizumi led a rapid Japanese response to the December 2004 Asian tsunami among a Quad task force created *ad hoc*, further strengthening Tokyo's bilateral strategic ties with New Delhi, Canberra, and Washington which Koizumi himself developed in his first years as Prime Minister (M. J. Green, 2022).

[82] Gurpreet S. Khurana, 2019.

cooperation strategies, intending to reshape Asian regional order (Type 3)[83], thus implementing PLA's modernization and becoming even more assertive in its East and South China Seas territorial claims, as well as vis-à-vis the Senkaku/Diaoyu Islands contention. Ultimately, Abe's first line of advantage subsided when Fukuda Yasuo of the Liberal Democratic Party (LDP) became Japan's Prime Minister in September 2007, restoring Tokyo's traditionally softer approach to foreign politics in line with the Yoshida Doctrine. Moreover, the Obama Administration in the United States and the Rudd Administration in Australia did not explicitly support QUAD's formalization into a summit. This led to its momentary demise between 2007 and Abe's return to leadership in Japan in 2012.

Nevertheless, Japan's *riekesen* had undoubtedly been modified by FOIP 1.0, given, for example, Tokyo's pivotal participation in the Delhi-Mumbai Industrial Corridor, which is expected to be completed in 2024[84]. This allowed Abe to resurrect the Free and Open Indo-Pacific framework during his second mandate as Japan's Prime Minister (2012 – 2014), firstly introducing the concept of a "democratic security diamond" connecting Tokyo, New Delhi, Canberra, and the Hawaiian archipelago without any explicit reference to QUAD[85]. Indeed, Abe's reiteration of FOIP's schemes, with enhanced infrastructure investments in Southeast Asia and Africa, and the restoration of the Quadrilateral Security Dialogue (QUAD 2) in 2017, was now favored by China's growing assertive policies in regional territorial and maritime disputes such as the South China Sea Arbitration 2103 case[86], and the 2010 Senkaku/Diaoyu boat collision incident between a Chinese trawler and Japanese Coast Guard (JCG) patrol boats, which sparked indignation and a wave of anti-Chinese sentiment among the Japanese population[87]. Hence, notwithstanding Abe's attempts to reconcile the economic-trade side of FOIP 2.0 with Xi Jinping's Belt and Road Initiative to counter Donald Trump's deranged US Asian trade politics, QUAD 2 was issued to defend Japan's new line of advantage and to implement Tokyo's national self-defense forces' responsiveness to external threat in collaboration with New Delhi, Washington, and Canberra, thus appearing to have kept its Group 3 Type 3 agreement characteristics[88]. Furthermore, Abe attempted to mitigate China's negative perception of QUAD 2 by engaging with Xi Jinping to improve bilateral relations despite the two leaders' "different views" on the above-mentioned territorial disputes and, more generally, the forming new Asian

[83] W. Paik, J. J. Park, The Quad's Search for Non-Military Roles and China's Strategic Response: Minilateralism, Infrastructure Investment, and Regional Balancing. In: *Journal of Contemporary China*, vol. 30, no. 127, 2021.
[84] https://dpiit.gov.in/programmes-and-schemes/delhi-mumbai-industrial-corridordmic lastly visited on March 18, 2023.
[85] Abe Shinzō, Asia's Democratic Security Diamond. In: *Project Syndicate*, 2012 (https://www.project-syndicate.org/magazine/a-strategic-alliance-for-japan-and-india-by-shinzo-abe lastly visited on March 18, 2023).
[86] S. V. Scott, China's nine-dash line, international law, and the Monroe Doctrine analogy. In: *China Information*, vol. 30(3), 2016.
[87] After the incident, Abe Shinzō accused China of engaging in *lebensraum* and trying to Finlandize Japan and South Korea, prompting the Japanese National Security Strategy to warn about the PRC's actions in the East and South China Seas in 2013.
[88] W. Paik, J. J. Park, 2021.

regional order[89]. However, as tensions between Tokyo and Beijing persisted, Abe used FOIP 2.0 and pre-existing regional and international forums and institutions to multilateralize "the China problem" by building external consensus to Japan's more proactive approach to foreign politics in ASEAN Plus, the United Nations General Assembly (UNGA), the United Nations Office for Outer Space Affairs (UNOOSA), the World Trade Organization (WTO), the G-7, and the OECD. In these contexts, Abe carefully highlighted Japan's commitment to democratic and liberal values to shift the Tokyo-Beijing competition on an ideological plan and therefore captivate those States which maintained tight economic ties with the PRC but whose national institutions were more related to democracies.

Lastly, Japan's direct competition with the PRC on technologies is a novel and crucial aspect of Abe's final rendition of the Free and Open Indo-Pacific framework. On the domestic side, Tokyo barred Huawei, ZTE, and supplementary Chinese telecommunication companies from participating in Japanese 5G bandwidth in 2015[90]. Moreover, in 2019 the Ministry of Economy, Trade and Industry (METI) released administrative guidance to Japanese corporate compliance officers not to undertake tech transfers or important business deals with Huawei, prompting a revision of Japan's Foreign Exchange Law to limit Chinese tech import in Japan the same year. On the international side, the 2019 redrafting of the Foreign Exchange Law and the ongoing trade war between the United States and China led Japanese tech firms to reshore their supply chains from the Shanghai Municipality to India, Australia, and ASEAN countries such as Vietnam and Thailand[91], whose markets were relatively safe from the US-PRC trade war and whose strategic significance for FOIP 2.0 was evident. Besides, Tokyo's decision to bar Chinese telecommunication firms from the Japanese domestic market felt necessary to prevent Beijing from acquiring sensitive information on technologies and security planning, as Washington and Ottawa first denounced Huawei's political espionage in 2018. These protectionist measures correlate with extensively diffused technonationalism that started at the beginning of the 21st century, progressively triggered by the bittering competition between the United States and the People's Republic of China. Commonly, technonationalism indicates public policies that direct consistent investment and support toward strategic domestic hi-tech industries to strengthen their competitiveness vis-à-vis foreign scientific and technological advancements[92]. Since 2012, the Japanese government has worked to increase Tokyo's coordination with the US in S&T

[89] One example of Abe's attempted "personal diplomacy" with Xi is the 2014 bilateral meeting in Beijing (https://www.reuters.com/article/us-china-japan-idUSKCN0IU08420141110 lastly visited on March 19, 2023).
[90] M. J. Green, 2022.
[91] https://www.ispionline.it/en/publication/japans-initiatives-secure-supply-chains-and-its-key-challenges-34186 lastly visited on March 19, 2023.
[92] J. L. Schoff, U.S.-Japan Technology Policy Coordination: Balancing Technonationalism With a Globalized World. In: *Carnegie Working Papers*, 2020 (https://carnegieendowment.org/files/Schoff_US-Japan.pdf).

policy, partially halted during the 1980s and the 1990s due to American protectionist acts towards Japanese hi-tech firms; the Abe administration also aimed to deepen American-Japanese cooperation in developing dual-use technology. Indeed, the Standing Senior Liaison Group for Space, established in 1979, transformed into the Comprehensive Dialogue on Space in 2013, mentioned in the first chapter of the present study. Then, in the 2015 revision of the Guided Lines for US-Japan Defense Cooperation, the US-Japan Systems and Technology Forum for defense-applicable scientific collaboration was elevated to a 'bilateral enterprise' guided by the US Department of Defense and the Japanese Ministry of Defense[93]. The primary goal of the US-Japan Systems and Technology Forum is 'to promote mutually beneficial cooperation in areas of systems and technology in support of the bilateral security relationship' by pursuing joint use of the best technological capabilities from both the United States and Japan and enhancing interoperability between American and Japanese systems[94]. In other words, the Forum aims to amplify American and Japanese smart power to compete more efficiently with the PRC and possibly prevent Chinese industrial and military espionage. Apart from being in line with FOIP 2.0 and the 1960 Treaty of Mutual Cooperation and Security between the United States and Japan, such Japanese proactiveness in preserving and increasing Tokyo's smart power since Abe's second term as Prime Minister reflects the fundamental role that science and technology have in post-World War II Japanese national identity[95], hence in Japan's foreign policy towards Asia and, more generally, the whole international community. In this sense, the Free and Open Indo-Pacific strategy shows a sense of continuity with Tokyo's past, albeit the purpose of not simply competing but containing Beijing's technological power remains pristine.

Nonetheless, although the Free and Open Indo-Pacific framework serves Japan as an external balancing regional blueprint and modern *riekesen*, China's growing military threat and North Korea's periodic provocations augmented Abe's urgency to accommodate the interpretation of Article 9 of the Japanese Constitution to create political and strategic internal balancing vis-à-vis a changing regional environment and an unclear American approach to Asia[96]. This necessity blossomed in a Constitutional Debate over Article 9 and in Parliamentary Arguments over if and how to upgrade the Self-Defense Force's (SDF) ability to deter external aggressiveness, especially after the escalation of the Senkaku/Diaoyu dispute during the mid-2010s. Abe and his faction strongly affirmed the urgency

[93] *Ibidem*.

[94] https://japan2.usembassy.gov/pdfs/wwwf-mdao-stf-brief.pdf lastly visited on May 27, 2023.

[95] Science and technology were pivotal for the reconstruction of Japan after the end of WWII. Furthermore, S&T also contributed to preserving certain Japanese cultural traditions, such as the involvement of the State in promoting homogeneity and uniformity in Japanese society. Morris Low defines this process as 'friendly authoritarianism' (M. Low, Displaying the Future: Techno-Nationalism and The Rise of The Consumer in Post-War Japan. In: *History and Technology*, 2003.

[96] Sheila A. Smith, Japan Rearmed – The Politics of Military Power. Cambridge, Harvard University Press, 2019.

of improving the SDF's deterring capability in this context. Furthermore, they advocated for more efficient means to cope with North Korea's missile launches toward the Sea of Japan and persistent incursions into national waters by Chinese submarines[97]. This enhanced defense system would also guarantee Japan immediate defense and relative security independence from the United States, thus allowing Tokyo to escape from the Thucydides' Trap generated by the 1947 Constitution and, more visibly, by the 1952 San Francisco Treaty[98].

Consequently, since his second term as Japan's Prime Minister, Abe proposed a new interpretation of the US-Japan alliance, equalizing Tokyo and Washington as "defenders of democracy in Asia" and adhering to President Obama's 2013 Trans-Pacific Partnership (TPP) project, thus reassuring the United States of the benign Japanese intentions behind LDP's new National Security Legislation proposals and the reinterpretation of Article 9, which resulted in a new legislative package in 2014. These reforms introduced relaxing restrictions on integration in the use of force with an ally – which allows Japanese SDF troops to support the US military with consistent logistical aid and to actively participate in the Malabar QUAD annual exercises as a full partner -; a coordinated Maritime SDF-JCG and American Navy response to "grey zone" coercions by the PRC that are not classified as "armed attacks" against Japan; and finally, reduced restrictions of the use of force by SDF for the aim of rescuing attacked personnel during UN peacekeeping missions and similar operations[99]. The 2014 legislative package on national defense amplified the smart power of the SDF, as Heng Yee-Kuang argues in her study about the Japanese Self-Defense Force and how it increased the use of smart power in its international activities. For instance, Heng notes that more active participation of the SDF in the US Navy's Pacific Partnership Program (PP) in South Pacific and Southeast Asia, with an incrementation of SDF's "international civilian assistance activity"[100] in the Philippines and Cambodia, as well as the deployment of the amphibious Self-Defense Force's vessel, the *Kunisaki*, for the 2014 PP exercise, has affected positively the US impression of not only the SDF itself but of Japan as an independent and trustworthy ally. Furthermore, SDF's more evident contribution to PP has attracted target audiences in Southeast Asia and South Pacific toward Tokyo's program to multilateralize and asses the Chinese territorial claims in these areas through cooperative frameworks and legislative measures[101].

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[97] S. A. Smith, 2019.

[98] Michael J. Green argues that the Treaty, which is primarily based on the UN Charter, established a fear of entrapment and, at the same time, of abandonment by the United States in Japanese policymakers, which conditioned Japan's international stance for decades after the signing of the Treaty (M. J. Green, 20222).

[99] *Ibidem*.

[100] Y. Heng, Smart Power and Japan's Self-Defense Forces. In: *Journal of Strategic Studies*, 2015.

[101] *Ibidem*.

Eventually, Abe's internal balancing to FOIP 2.0 culminated in establishing a National Security Council (NSC) system in 2014 composed of staff from the Foreign Affairs and Defense ministries and SDF officials. During Abe's terms as Prime Minister, the Japanese NSC successfully shaped US strategic politics toward Asia by restoring the QUAD despite Trump's frequently destabilizing personal initiatives, and it helped coordination between the three branches of the SDF – Ground, Maritime, and Air forces – and overall jointness between civilian and uniformed administration[102].

As tensions continue growing in the "Indo-Pacific" region, present Japanese Prime Minister Kishida Fumio seeks to maintain certain internal balancing aspects of Abe's grand strategy, such as the increased defense budget and Japan's strive for a more efficient deterrence system towards the North Korean threat. However, Kishida's NSC appears less influential than its predecessor, given the Biden administration's more assertive approach toward Asia and a rising US-India bilateral friendship. Nonetheless, Kishida seems committed to conserving Japan's modern line of advantage in the "Indo-Pacific," enhancing FOIP 2.0's economic aspects, and fortifying Tokyo's ties with New Delhi, Washington, and Canberra through political and investment cooperation[103].

Japan's dedication to the "Indo-Pacific" framework in the first decades of the 21st century undoubtedly substantially impacted India, which became Japan's preferred partner in the region. Indeed, Tokyo's influence on New Delhi's recent foreign politics is evident in Prime Minister Narendra Modi's Act East Policy, which this study will center on in the next section.

### *India: Acting East*

After the disintegration of the USSR in the early 1990s, India's foreign policy shifted to accommodate incumbent national economic and strategic necessities. Indeed, to prevent isolation from the then-forming unipolar international order, New Delhi abandoned its traditional non-alignment and adopted a welcoming and engaging stance towards Asian regionalism, which was starting to grow in relevance at the time[104]. Moreover, to further signal India's new benevolent approach to Asia and international relations, the government led by Prime Minister P. V. Narasimha Rao promoted macro-economic, structural reforms to convert the Indian economy to an open, private-driven model vis-à-vis New Delhi's historical economic autarchy[105]. Hence, India inaugurated its "Look East" policy in 1992 to pursue stable economic ties with the countries of ASEAN and the East Asian States, aiming to

[102] *Ibidem*.
[103] For example, https://www.japantimes.co.jp/news/2023/03/17/national/politics-diplomacy/kishida-india-indo-pacific/?utm_source=pianoDNU&utm_medium=email&utm_campaign=72&tpcc=dnu&pnespid=9e6BmIVFuvXHo6S0vhaspuUN5A0S8nRsgAB5GkFsoEqVTd9ZnayQOA_R2DUIiiwyH.F2vQ (lastly visited on March 19, 2023).
[104] A. Malhotra, India in the Indo-Pacific. Understanding India's Security Orientation towards Southeast and East Asia. Opladen, Barbara Budrich Publishers, 2022.
[105] *Ibidem*.

progressively associate economic partnerships with a mutual political and strategic understanding through internal coordination between the Ministry of Commerce and Industry and the Ministry of External Affairs. Singapore and Japan responded enthusiastically to India's political and economic shift. Accordingly, Singapore supported New Delhi's participation in ASEAN as a Sectoral Dialogue Partner in commerce, tourism, investment, and science in 1992 and as a Full Dialogue Partner in 1996. But, unfortunately, the relations between India and other ASEAN Members did not reach meaningful outcomes then[106].

On the other hand, New Delhi's substantial economic reforms attracted Tokyo, a top foreign investor in India in the 1990s[107], despite the severe challenges posed by the 1997 Asian financial crisis. Japanese involvement in New Delhi's new market-driven economy officially began in 1995 when Tokyo's then Minister of International Trade and Industry, Hashimoto Ryutaro, visited India[108]. Furthermore, given the at-time-weakened security partnership between the United States and Japan[109], Tokyo attempted to introduce a strategic component to the bilateral dialogue with New Delhi. Nonetheless, India's nuclear tests in 1998 distressed Japan and momentarily foiled the relationship between Tokyo and New Delhi, with the Japanese government temporarily recalling its ambassador and freezing its grant aid to India in all sectors except for humanitarian assistance[110].

As New Delhi sought to be globally recognized as an 'emergent power' in the 2000s, the Indian government opted for a multi-aligned foreign policy and more proactiveness in international institutions to foster prime and complementary bilateral strategic partnerships. In this context, the ties between India and Japan revived after growing diplomatic understanding between New Delhi and Washington with the Talbott-Singh Dialogue[111]. In the mid-2000s, India was favored by Abe's new approach to Japanese foreign and security policies, becoming an indispensable ally in Tokyo's strategic vision for the Asian continent. Moreover, Abe's interest in Indian culture and history served well India-Japan relations, as Indian Prime Minister Manmohan Singh visited Japan in 2006 at Abe's invitation and addressed the National Diet. During Singh's official Japanese sojourn, the two Prime Ministers also advanced the 'India-Japan Global Partnership,' established at the beginning of the 21st century, to a 'Strategic and Global Partnership' status[112]. Importantly, Abe chose its institutional visit

[106] *Ibidem*.
[107] A. Malhotra, 2022.
[108] https://www.mofa.go.jp/region/asia-paci/india/data.html lastly visited on May 31, 2023.
[109] During the 1990-91 Gulf War, when Japan could not contribute its troops to the United States-led forces due to constitutional restrictions, a domestic debate over Tokyo's unimportance in international crisis and excessive reliance on the US resuscitated and gained further relevance after the North Korean nuclear tests emergency in 1993-4, as the United States considered the possibility of a military confrontation with Pyongyang that could have involved Japan and the other Asian partners of the United States.
[110] A. Malhotra, 2022.
[111] *Ibidem*.
[112] *Ibidem*.

to India and its address to the Indian Parliament in 2007 to formally present FOIP 1.0 and speak of the "confluence of the two seas" to highlight the interdependent nature of Japanese and Indian leading roles in the "Indo-Pacific" region[113]. Shared economic interests and common strategic concerns over growing Chinese assertiveness reinforced Abe's message in New Delhi, with Prime Minister Singh actively working with Tokyo to improve the bilateral partnership, as well as India's foreign policy toward the ASEAN countries, in the hope to fully integrate them into a peaceful and prosper "Indo-Pacific" region under Indian and Japanese guidance.

Indeed, when Indian Prime Minister Narendra Modi was first elected in 2014, he promptly unveiled India's new foreign policy, "Act East, " to strengthen the ties between New Delhi and the ASEAN countries and expand India's maritime influence on the Pacific Ocean by enhancing economic and security cooperation with the Pacific Islands Countries (PICs). However, albeit Modi presented the Act East Policy as a continuation of India's historic non-alignment behavior in international relations, it is confirmed that New Delhi has taken significant steps toward official positioning with the other QUAD members, especially Japan. In fact, since 2012, Tokyo has carefully intercepted India's growing concerns over China's extension of the BRI and its military presence to Central Asia and the Indian Ocean, shaping India's foreign policy strategy to converge with FOIP 2.0[114]. Moreover, India's extending dependence on international trade has contributed to New Delhi's sensibility toward Beijing's assertiveness in the South China Sea, specifically in the Malacca Strait area, leading Modi to seek Abe's cooperation to secure maritime routes in the region and establish a more proactive Indian military stance[115]. In this context, ASEAN Member States play a fundamental role by being the primary objective of New Delhi's Act East Policy.

Indeed, India's newfound desire to be a leading actor in the Indian and Pacific Oceans, reflecting domestic security and developmental issues, prompted New Delhi to reorient its foreign policy to reach stable economic-trade relations with the ASEAN members. Modi's "Neighborhood First" part of the Act East Policy serves for regional integration between India and ASEAN through a comprehensive series of infrastructure projects, trade, and security accords between New Delhi and the ASEAN countries to reduce China's regional influence. One recent example of India's "Neighborhood First" strategy is the Plan of Action (PoA) to Implement the AESAN-India Partnership for Peace, Progress, and Shared Prosperity (2021-2025) established between India and

[113] https://www.mofa.go.jp/region/asia-paci/pmv0708/speech-2.html lastly visited on May 31, 2023.

[114] In these regards, Japan and India depend on energetic resources from the Middle East, which reach the two countries through commercial routes in Central Asia and the Indian Oceans (B. Chhibber, India-Japan Relations. In: *The Journal of International Issues*, vol. 22, no. 3, 2018).

[115] J. P. Panda, India and the Pacific Ocean: The "Act East" Between Trade, Infrastructure and Security. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.

the ASEAN member states in 2020[116]. New Delhi's propositions for economic cooperation with ASEAN are reinforced by India's extensive partnership with Japan on infrastructure, trade, and technology, which is evident in the 2017 Manufacturing Skill Transfer Promotion Program and the creation of Japan-India Institutes for Manufacturing in the North-Eastern Indian regions, as well as in the India-Japan Investment Promotion Partnership, which has been active since 2014 and advanced critical Japanese infrastructure and technology investments in smart city projects in Ahmedabad, Chennai, and Varanasi[117]. India intends to connect these internal developments to the implementation of the 2020 PoA by following the Japanese model that Tokyo has applied to Japan-India economic relations and linking essential domestic infrastructure in the North-Eastern Indian regions to the India-Myanmar-Thailand Friendship Highway, which New Delhi hopes to expand to Cambodia, Laos, and Vietnam[118]. For its part, Japan welcomes the Highway as a salient continental connectivity tool to counter China's BRI assets in Southeast Asia[119]. Furthermore, the PoA promotes maritime transport cooperation between India and the ASEAN Members by creating a regional logistic network that would grant New Delhi – and, subsequently, Tokyo[120] – civil and military access to strategic ports.

Another 2022 ASEAN-India PoA for Peace, Progress, and Shared Prosperity section is dedicated to security cooperation. In this segment, the two parties vowed to reinforce their political and strategic partnership by implementing their diplomatic ties and, specifically, India's active participation in regional frameworks such as the EAS and the ASEAN Retail-Chain Franchise Federation (ARFF). The common intention in this part of the PoA is to promote dialogue and strengthen practical defense cooperation against common challenges. This point and those advocating for maritime safety and freedom of navigation and overflight perfectly converge with the 2015 Japan-India Joint Statement entitled "Vision 2025: Special Strategic and Global Partnership Working Together for Peace and Prosperity of the Indo-Pacific Region and The World," which also appeals to the importance of democratic values and the rule of law, territorial integrity, and the preservation of an open global trade regime[121]. Moreover, as New Delhi and the ASEAN countries coordinate at multiple levels against transnational crime and terrorism, the Japan-India maritime security Act East Forum and Tokyo and New Delhi's collective experience in counterterrorism in the Middle East since 2017 will

[116] https://asean.org/wp-content/uploads/2020/09/ASEAN-India-POA-2021-2025-Final.pdf lastly visited on April 1, 2023.
[117] B. Chhibber, 2018.
[118] https://www.aseanbriefing.com/news/india-eager-for-expansion-of-trilateral-highway-to-cambodia-laos-and-vietnam/ lastly visited on April 1, 2023.
[119] https://asia.nikkei.com/Politics/International-relations/Modi-backs-IndiaMyanmarThailand-highway-extension lastly visited on April 1, 2023.
[120] A. Berkofsky, Japan and the Indo-Pacific: Alive and Kicking. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.
[121] B. Chhibber, 2018.

undoubtedly play a central role in determining India's attitudes toward safekeeping the "Indo-Pacific" region. Besides, since their joint counterterrorism actions in 2017, Japan has provided India with advanced military technology and amphibian aircraft, strengthening New Delhi's military maritime posture.

This has allowed India to enlarge its strategic horizon to the PICs, particularly Fiji, with which Modi has established economic and security ties similar to New Delhi's connections with ASEAN[122]. India's will to cooperate with the PICs blossoms from a national need to enhance the Act East Policy by nurturing economic and strategic partnerships with traditionally less prominent countries, which can sponsor New Delhi in regional and international forums in its quest to be recognized as a regional maritime power. To fortify the cooperation with PICs, under Modi's presidency, India has promoted private trade investment following the model set by the Japanese government in establishing economic ties with New Delhi, hence instituting Centers of Excellence in Information Technology (CEITs) across PICs and fostering FIPIC sub-commissions on environmental threats and regional development. Furthermore, India and Fiji signed a Memorandum of Understanding (MoU) in 2017 regarding disaster management, humanitarian assistance, and military training. This MoU has allowed New Delhi to organize several initiatives on science and technology and security governance in the PICs area. Among these, New Delhi's project for an ISRO Space Technology Application Center in one of the PICs is worth mentioning.

Nonetheless, four issues in Modi's Act East Policy threaten India's credibility as a leading actor in the "Indo-Pacific" framework. First, New Delhi's definition of "Indo-Pacific" still appears ambiguous to many ASEAN countries and the remaining QUAD members. Indeed, Modi chooses to keep his vision for the "Indo-Pacific" region 'inclusive'[123], which indicates that India could still be open to Chinese participation, at least for what concerns trade and investments, and without the legal guarantees which ASEAN and Japan advocate for possible regional economic coordination with Beijing.

Second, and linked to the first topic, is the deep commercial ties between India and China, rooted in the geographical continuity between the two countries and their development paths as continental regional powers. On the geographical side, India's power resources strongly depend on the PRC's hydric energy policies since numerous Indian rivers generate in Chinese territory. On the development side, the first Modi government firmly focused on correcting India's long-standing internal economic issues by rebalancing its trade relationship with Beijing and signing a five-year

[122]A result of the dialogue between India and the PICs is the Forum for India-Pacific Islands Cooperation (FIPIC), whose inaugural summit was held in Suva, Fiji, in November 2014 (J. P. Panda, 2019).

[123]C. Bajpaee, Dephasing India's Look East/Act East Policy. In: *Contemporary Southeast Asia*, vol. 39, no. 2, 2017.

economic and trade development plan with China in 2015, which allowed Chinese investment in India's rail network and industrial parks[124]. This and what is traditionally perceived as the China-India hardware-software codependency sparked an FDI competition between Japan and the PRC on Indian territory, decelerating New Delhi's internal development and regional infrastructure projects with ASEAN.

Third, Modi's political roots and internal propaganda discourse, undeniably linked to Hindu Nationalism or Hindutva, might alienate some ASEAN Member States from partnering with India if taken to further extremes. In fact, as a long-standing member of the Hindutva Bharatiya Janata Party (BJP), Modi has integrated the otherization of non-Hindu Indians, especially Muslims, into his political communication, pairing it with constant appeals to the Indian population to "come together as one" and "march towards [economic] development."[125] Overall, Hindu Nationalism nullifies any actual diversification between Indian and Hindu identities, therefore excluding and chastising – if not openly castigating, religious minorities and political reformists. Mainly, Muslims have been the preferred target of Hindutva's accusations and propaganda due to a nationalist reinterpretation of Indian history that projects a 'halo effect' on Ancient Hindu Kingdoms while casting Muslim predominance in South Asia (thirteen to nineteenth century CE) as a decadent period for India[126]. Albeit being less explicitly anti-Muslim than other members of his government, Modi reprises Hindutva's narrative by consistently reconnecting India's recent astonishing economic growth and international relevance to Hinduist traditions and historical situations dating back to Ancient India, purposely ignoring India's Islamic minority at the same time[127]. This systemic erosion of India's Islamic heritage, associated with Hindutva's violence against the Indian Muslim minority, could estrange ASEAN countries with large Muslim majorities, such as Indonesia, Brunei, and Malaysia, to deepen their strategic relationships with New Delhi, if the Modi administration would pursue more defined pro-Hindutva domestic reforms in the future.

Lastly, India's status as a regional power relies on its trilateral relationship with Japan and the United States, elevated to the ministerial level in 2015 with the Trilateral Dialogue summits. However, despite a fruitful Japan-India development assistance bilateral relationship and the United States

[124] C. Bajpaee, China-India: Regional Dimensions of the Bilateral Relationship. In: *Strategic Studies Quarterly*, vol. 9, no. 4, 2015.

[125] Modi, 2017, via P. Waikar, Reading Islamophobia in Hindutva: An Analysis of Narendra Modi's Political Discourse. In: *Islamophobia Studies Journal*, 2018.

[126] *Ibidem*.

[127] On various occasions (for example, in 2014 and 2017), Modi supported Indian Muslims by distancing them from terrorism and celebrating Sufi ideas. However, Waikar finds elements of intrinsic Islamophobia also in Modi's rhetoric of promotion, as the BJP insists on affirming the Hindu origins of all the Muslim Indians whose ancestors are said to have converted to Islam out of fear of Muslims rulers; hence, Sufism would have been tamed by Hinduism in its religious messages and practices (P. Waikar, 2018).

surpassing the Russian Federation in arms trade with New Delhi in recent years, the Trilateral Dialogue still lacks those robust economic ties the three countries still singularly share with China[128]. Moreover, Washington's unclear trade policy toward Tokyo and New Delhi during the Trump Administration weakened the Trilateral Dialogue to the point where it indirectly damaged Japanese and Indian credibility in implementing their joint Asia-Africa Growth Corridor (AAGC) vis-à-vis China's solid commitment to the African branch of BRI.

New Delhi's and Tokyo's adaptation to Washington's frequently changing behavior will be assessed in the following section, dedicated to the American grand strategy for the "Indo-Pacific" framework.

### *The United States and the Indo-Pacific Dilemma*

The United States adopted the "Indo-Pacific" outlook to juxtapose it with the more traditional "Asia-Pacific" framework during the Obama administration (2009-2017) after Abe Shinzō's 2007 address to the Indian Parliament. A geopolitical definition of the "Indo-Pacific" region made its first official American apparition in 2013 when then-Secretary of State Hillary Clinton theorized a new US pivot to Asia in her seminal article *America's Pacific Century*, on *Foreign Policy*[129]. In her feature, Clinton did not mention Abe's concept of the "democratic security diamond," which the then-Japanese Prime Minister proposed in an article on *Project Syndicate* the previous year. Instead, she focused on shaping China's foreign policy to guarantee a multifaced "Indo-Pacific" under benign American hegemony. Accordingly, since Xi Jinping's first administration was formed in 2012, the Obama administration attempted to subdue increasing Chinese activities in the East and South China Seas through freedom of navigation operations (FONOPs)[130], especially in the Spratly and Paracel Islands, where the PRC had been building facilities despite territorial contentions with Malaysia, the Philippines, Taiwan, and Vietnam. Despite FONOPs were not effective in deterring Chinese ventures in the South China Sea, the Obama administration successfully included the US East Asian, Southeast Asian, and Pacific partners in the creation of a security network between the United States, Japan, South Korea, Taiwan, the Philippines, Thailand, and Australia. The Terminal High Altitude Area Defense (THAAD) system was Obama's peak missile defense policy in Asia and consists of a surface-to-air defense mechanism against intermediate-range ballistic missiles, still operative and operated by Lockheed Martin[131]. On the economic side, the Obama administration demanded more

[128] B. Chhibber, 2018.

[129] H. Clinton, America's Pacific Century. In: *Foreign Policy Magazine*, 2013 (https://foreignpolicy.com/2011/10/11/americas-pacific-century/ lastly visited on April 2, 2023).

[130] S. Kawashima, Japan-US-China Relations during the Trump Administration and the Outlook for East Asia. In: *Asia-Pacific Review*, 2017.

[131] https://www.lockheedmartin.com/en-us/products/thaad.html lastly visited on May 31, 2023.

financial responsibility from its Asian allies due to internal financial issues arising in the US; at the same time, in 2015, Washington proposed the Trans-Pacific Partnership (TPP) to liberalize trade among the Pacific Rim economies, including some members of the Asia-Pacific Economic Cooperation (APEC), further. Albeit the Obama administration never denied China access to the preliminary talks, *de facto*, the TPP created a stockade around the People's Republic of China, whose State-directed economic system is not sufficiently flexible to adhere to the Trans-Pacific Partnership[132]. Nevertheless, the US pivot to Asia during the Obama administration was still relatively moderate in its approach toward the PRC, as demonstrated by the fact that still during the FONOPs in the East and South China Seas, the United States and the People's Republic of China participated in the Rim of the Pacific Exercise together[133].

The Trump administration (2017-2021) absorbed the "Indo-Pacific" concept. However, it rebranded it in 2017 when then-Secretary of State Rex Tillerson advocated for a "free and open Indo-Pacific region" without addressing further the meaning of this new American formulation of its Asian regional blueprint nor explicitly referring to a governmental strategy[134]. Then-Deputy Assistant Secretary of State for East Asia and the Pacific Alex Wong attempted to clarify Tillerson's words in 2018 during a White House press briefing. Wong described the administration's vision of a "free and open Indo-Pacific" as a region 'free in terms of governance, in terms of fundamental rights, in terms of transparency, in terms of anti-corruption […]' and 'open in infrastructure, […] investment, […] trade'[135]. These two concepts were reiterated by Trump's newly nominated Secretary of State, Mike Pompeo, later that year when he also announced the creation of a US$113 million fund to promote public-private economic partnerships across the "Indo-Pacific" region. In addition, Pompeo urgently added a commercial declination to the 2018 US strategy for the "Indo-Pacific" to prove the American commitment to the Asian maritime geopolitical framework, as the Trump administration had been stung by criticism about the lack of practical measures in its tactic. To further demonstrate the solemnity of the American "Indo-Pacific" strategy, on July 30, 2018, the Overseas Private Investment Corp. (OPIC) announced a joint trilateral investment partnership for the region with Japan's Bank for International Cooperation and Australia's Department of Foreign Affairs and Trade[136], which, however, is yet to be successful.

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[132] S. Kawashima, 2017.
[133] *Ibidem*.
[134] B. Glosserman, An Administration at War with itself: The New US Strategy for the Indo-Pacific. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.
[135] *Ibidem*.
[136] https://www.exportfinance.gov.au/newsroom/australia-us-and-japan-announce-trilateral-partnership/ lastly visited on April 2, 2023.

Still, despite the efforts, attempts to implement the US "Indo-Pacific" strategy under the Trump administration appear not to have reached favorable results. Indeed, the President's political initiatives and distorted vision of global economics and trade caused wariness among the other QUAD participants, especially Japan and India.

Specifically, Tokyo was prostrated by Trump's bilateral summits with North Korean dictator Kim Jong Il and the Administration's detachment from Japan's core security issues when the then-American President neglected the 2018 East Asian Summit and the APEC Leaders' Meeting. Moreover, the withdrawal of the United States from the Trans-Pacific Partnership in 2017 and Trump's ideological campaign against the World Trade Organization (WTO) framework and international liberal trade to preserve what the Administration officially branded as 'national security,' which also generated American tariffs to steel export from Tokyo[137], further alerted Japan on American reliability to maintain regional balance in the "Indo-Pacific" set.

India was another American partner who fell victim to Trump's tariffs at the beginning of 2018. Again, the restriction imposed on Indian trade regarded steel and aluminum, covering approximately 2.5 percent of New Delhi's exports to Washington in 2017[138]. After India filed a formal dispute to WTO without retaliating with tariffs on US exports, the mini-trade war continued when the Trump administration further sanctioned New Delhi on solar panels and washing machine exports and established GPS-related tariffs, leading to India withdrawing from the US GPS services and finally implementing its tariffs on American fruit exports in 2019[139]. Nonetheless, despite its unilateral economic aggression to New Delhi, the Trump administration still approached India with the same conviction as previous American administrations that due to shared democratic values and strategic objectives in the Indian Ocean, New Delhi would be more inclined to choose an exclusive alliance with the United States instead of maintaining any form of coordination with the PRC[140]. This position does not consider India's historical commitment to sovereignty, independence, and neutrality, which still shapes New Delhi's behavior in international relations in the 21st century, even in Modi's Act East Policy.

This specific issue involving sovereignty and values also regarded the Trump administration's general approach to the "Indo-Pacific" framework. Indeed, if Japan and India based their "Vision 2025" for the "Indo-Pacific" on international trade and state sovereignty norms, the American strategy for the region elaborated by the Trump administration strongly relied on a moral characterization of the terms

[137] M. J. Green, 2022.
[138] https://www.piie.com/blogs/trade-and-investment-policy-watch/trumps-mini-trade-war-india lastly visited on April 2, 2023.
[139] *Ibidem*.
[140] B. Glosserman, 2019.

'free and open.' This operation is yet another manifestation of American messianism in foreign politics. In fact, during Trump's presidency, it alienated numerous ASEAN States that do not align with democratic values and fear American intrusion in their national governance[141].

Furthermore, such moral qualification of the "Indo-Pacific" framework implied the impossibility for Washington and its allies and partners to establish any form of connection with Beijing, given that to Trump and his administration, China was the principal competitor to the US for hegemony in Asia and, more broadly, in the global arena, as suggested by three official documents released in 2017 regarding Washington's foreign policy: the National Security Strategy, the National Defense Strategy, and the Nuclear Posture Review[142]. Moreover, domestically, Trump's China Policy reflected the prevailing view among the security experts of the Republican Party, who advocate for a stern, Reagan-style approach toward the PRC to regain "peace through strength."[143] Indeed, Trump's delegative style of leadership allowed a considerable margin of action to officials from the Security Council, the State, and the Defense Departments, who capably and effectively co-opted Abe's desire to revive the QUAD and the People's Republic of China's perceived aggressiveness in the "Indo-Pacific" framework to promote and participate in the second rendition of the Quadrilateral Security Dialogue with explicit anti-Chinese intents[144]. In addition, the success of the Administration in revitalizing the QUAD also derived from President Trump's cavalier approach to foreign policy and to the 'China threat,' which forced Japan and Australia, traditional security allies of the United States, to enhance and deepen their partnership with India to prevent any complication in their national security systems[145].

However, despite the US-China trade war, which sparked in 2018 at the end of Trump's presidency, China still was the US first commercial partner and the largest holder of US treasury bills. Besides, as mentioned in this chapter, all the significant actors in the "Indo-Pacific" framework shared – and

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[141] *Ibidem*.

[142] F. Kubo, Reading the Trump Administration's China Policy. In: *Asia-Pacific Review*, 2019.

[143] The slogan "peace through strength" was used profusely by Ronald W. Reagan during his campaign for the Presidential Elections of 1980. It later became the leitmotiv of what is now called the Reagan Doctrine of foreign policy, which essentially sponsors the modernization and the implementation of US military forces "to support freedom all around the world." Notably, the Strategic Defense Initiative, officially incorporating the weaponization of US assets in outer space, was central to the Reagan Doctrine. Likewise, Donald Trump purposely used the "peace through strength" slogan during his election campaign 2016, albeit its strategic meaning is entirely different from Trump's original "America First" approach, which promoted US isolationism. Kubo notes that, after assuming the US presidency, Trump discarded the "America First" concept for foreign policy and attempted to recreate the Reagan Doctrine (https://www.reaganlibrary.gov/permanent-exhibits/peace-through-strength lastly visited on May 31, 2023, and F. Kubo, 2019).

[144] A. Mukherjee, With a little help from China: the Trump administration and the reinvigoration of the Quad. In: *India Review*, 2023.

[145] *Ibidem*.

still do - extensive economic ties with Beijing. Therefore, the complete isolation of the PRC from the "Indo-Pacific" scenario has never been feasible.

Finally, the Biden administration (2021-) corrected Trump's tariffs against Japan and India and attempted to reassure Tokyo that 'America is back'[146] in the "Indo-Pacific" framework as a more proactive actor than during Trump's presidency. Biden's new approach to the "Indo-Pacific" has been sustained by the American return to the containment strategy against North Korea, with a recent intensification of the Trilateral Military Dialogue between the US, Japan, and the Republic of Korea (ROK). Moreover, the Biden administration has appeared more interested in strengthening US-India ties through cultural diplomacy and increased consideration of American citizens of Indian origins by the White House, as proved by President Biden's formal reception for the 2022 Diwali celebrations[147]. Nevertheless, a preference for national security and US traditional messianic foreign policy is still evident in Biden's assertive stance against China, particularly Beijing's claims over Taiwan and minor territories in the South China Sea and the East China Sea. The Biden administration also aims to protect the American technology sector and redirect monetary fluxes from the PRC back to the United States, which the Trump administration declared to be the object of its economic policy[148]. Although Tokyo seems to respond positively to Biden's posture against China, it is unclear if New Delhi will favor its growing relationship with Washington to detach its foreign policy from historical neutrality.

***Conclusions***

Although it originates from European geopolitics of the early 20th century, the "Indo-Pacific" framework was brought to popularity in the 21st century by Japanese Prime Minister Abe Shinzō, who theorized its modern geostrategic and geoeconomic characteristics in the early 2000s and then again during his second presidential mandate in 2012. Abe's rendition of the "Indo-Pacific" framework generated multiple grand strategies from all the most significant regional actors, which adjusted their foreign policies to cooperate or counter Tokyo's proactiveness during Abe's presidency. In any case, Japan and India remain the most enthusiastic sponsor of the "Indo-Pacific"

146 https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/02/04/remarks-by-president-biden-on-americas-place-in-the-world/ lastly visited on April 2, 2023.

147 https://www.whitehouse.gov/briefing-room/statements-releases/2022/10/24/statement-by-president-joe-biden-on-diwali/ lastly visited on April 2, 2023.

148 The most recent example of Biden's economic strategy against China is the CHIPS and Science Act, which the US President signed in the second half of 2022 with bipartisan support in Congress (https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/ lastly visited on April 2, 2023).

framework, which serves as a tool for the two countries to elevate their regional status and balance China's economic power and growing military assertiveness.

In this context, space cooperation between JAXA and ISRO is fundamental to implementing Japan-India infrastructure and tech investments in ASEAN member states and aims to equalize Beijing's scientific and technological capacities. Therefore, the Japan-India space cooperation and joint space projects will be the objects of the following and last chapter of the present work.

## *Chapter 3: Space and the Indo-Pacific*

The national strategies for the "Indo-Pacific" region, which were examined in the previous chapter of this study, primarily focused on maritime security and trade. Nonetheless, since the beginning of the Second Space Age with the first crewed flight of the Chinese Space Program, space exploration, and space technology development have been included by the governments of the "Indo-Pacific" states in official national defense guidelines as sensitive topics.

As discussed in the first chapter of the present work, Japan restructured its space program at the beginning of the 21st century to sustain technological competition with the People's Republic of China (PRC) and serve national defense purposes. Furthermore, under Abe Shinzo's premiership, space was included in Japan's Free and Open Indo-Pacific vision. As a result, it became an essential tool to achieve Tokyo's international and national security objectives, as demonstrated by the increasing importance given to space technology development in Japan's National Defense Program Guidelines (NDPG) in 2013 and 2018[149] and by Japanese dedication to regional and global space governance forums, as well as International Space Law.

Besides, India has been advancing its civilian space program, and DRDO's missile program with similar purposes as its space cooperation projects with the PICs and New Delhi's intention to create an anti-Chinese deterrence system using ASAT weapons and satellite interference illustrate. Moreover, by fostering the national space sector, the Modi Administration hopes to attract investments and private participation[150].

In this context, space cooperation between JAXA and ISRO started in 2016, with the joint Lunar Polar Exploration (LUPEX) lander and rover mission and shared Space Situational Awareness (SSA) objectives being the most substantial outcomes of this collaborative scientific and diplomatic effort.

The present chapter will indeed analyze Japanese and Indian national space diplomacies as well as their cooperative endeavors concerning the joint Lunar Polar Exploration mission to maintain their status as regional space powers considering their respective security strategies for the "Indo-Pacific."

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[149] H. Yoshimatsu, Japan's Asia Diplomacy – Power Transition, Domestic Politics, and Diffusion of Ideas. Singapore, Springer Nature, 2021.

[150] https://www.hindustantimes.com/india-news/at-inspace-hq-pm-modi-s-big-announcement-for-india-s-space-sector-101654870603273.html lastly visited on April 22, 2023.

***Japan: Space and the FOIP Strategy***

In analyzing Tokyo's Free and Open Indo-Pacific strategy, technological competition with China emerged as a focal point in Japan's proactive foreign politics under Abe's presidency. Furthermore, another crucial aspect of FOIP is Japan's national security vis-à-vis growing geopolitical instability in the "Indo-Pacific" region. Therefore, the Abe administration responded by restructuring Tokyo's governmental institutions and the National Self-Defense Force (SDF), as noted in the previous chapter of this study. In addition, Japan's grand strategy includes governmental reforms and the new space exploration and satellite projects spurred by the 2008 Basic Space Law, which were previously examined.

In fact, under the political guidance of the Strategic Headquarters for National Space Policy (SHNSP) and, since 2012, the Committee on National Space Policy (CNSP) within the Cabinet Office, the Japanese space policy became an effective instrument to expand Tokyo's soft power in the "Indo-Pacific" region and beyond through meticulous space diplomacy within regional and international forums. Consequently, Japan has been seeking a leading position in the Asia-Pacific Regional Space Agency Forum (APRSAF) and, since 2017, has favored the inclusion of international space governance and space security in the QUAD agenda. Globally, Tokyo has been highly involved in the UN Office for Outer Space Affairs (UNOOSA), the UN Committee on the Peaceful Uses of Outer Space (COPUOS), and its Legal and Scientific Committees.

With regards to APRSAF, it was established in Tokyo in 1993, following the 1992 Asia-Pacific International Space Year. APRSAF comprises space agencies, governmental envoys, universities, international organizations, and private institutions from more than 40 countries and is organized in five working groups and a Space Industry Workshop for start-ups and enterprises[151]. With JAXA among the co-host of all APRSAF annual meetings, Japan aims to serve as the informal leader of space activities in the "Indo-Pacific" region by promoting multilateral scientific initiatives to assess climate security and disaster management and technical cooperation programs. During Abe's mandates as Prime Minister, Tokyo indeed used its influence in APRSAF to balance China's initiatives for scientific space cooperation with the members of another regional forum, the Asia-Pacific Space Cooperation Organization (APSCO), which is less prominent than APRSAF in terms of the number of participants but is still impactful for the "Indo-Pacific" space development[152]. Specifically, Japan is one of 29 countries participating in APRSAF's Sentinel Asia program to apply remote sensing and Web-GIS technologies to disaster management. Sentinel Asia's objectives

[151] https://www.aprsaf.org/about/ lastly visited on April 22, 2023.

[152] At present, the "Indo-Pacific" countries among the eight members of APSCO are Bangladesh, Pakistan, the PRC, and Thailand. Nonetheless, China, Pakistan, and Thailand are also part of APRSAF (H. Yoshimatsu, 2021).

include improving regional safety and disaster prevention using a step-by-step approach for its technical implementation[153]. JAXA, being part of the International Charter of Space and Major Disasters, contributes to the Sentinel Asia initiative as a member of its executive board and provides satellite data from its *Alos-2* and *Kibo HDTV-EF2* spacecraft. Among Sentinel Asia's successful operations conducted with data from JAXA's *Alos-2*, there is the monitoring of the Taiwan Earthquake in 2018 and the Philippines Volcanic Eruption in 2020[154]. Tokyo is also the main sponsor and operator of APRSAF's Kibo-ABC initiative to promote the utilization of the Japanese Experiment Module of the ISS for scientific research among the "Indo-Pacific" countries[155]. The program includes workshops and seminars facilitated by JAXA to develop multilevel technical cooperation with other national space agencies and research institutes in the "Indo-Pacific" region. In addition, participants are invited to submit proposals for experiments to be conducted on board the Kibo module of the ISS by Japanese astronauts[156].

Since 2009, JAXA has also implemented its contribution to ISS with its automated H-II Transfer Vehicle *Kounotori*, used to deliver supplies to the International Space Station by connecting with the American module *Harmony*, symbolizing the long-standing and fruitful scientific space collaboration between Japan and the United States[157]. On this note, the US-Japan cooperation in space has expanded to assess the tactical and economic concerns the two countries share on orbital debris, a potential threat to Japanese, but mainly US, space assets and human operations[158]. Space debris generally consists of natural objects – asteroids and their residues, and human-made orbital waste from dead satellites and other abandoned spacecraft that could collide with functioning space objects or, more terrifyingly, with crewed spaceships and space stations[159]. Since the beginning of the 21st century, artificial debris has also been the most visible outcome of ASAT tests; hence, orbital debris has become a security issue not only for space endeavors but also for its plausible effects on space-dependent terrestrial military and civil activities. In 2013, Japan and the United States signed an SSA Service and Informational Agreement to monitor and reduce orbital debris. The main objective of the US-Japan space collaboration on orbital debris is to protect US dual-use space assets from collisions, a strategic disquietude that the United States shares with all its allies but that is especially relevant to Japan, given Tokyo's security dependence on Washington also in the space sector[160]. The competent

[153] https://storymaps.arcgis.com/stories/ae487f74e92741c2b14bb396cc1e3cd7 lastly visited on April 22, 2023.
[154] https://earth.jaxa.jp/en/application/disaster/sentinel-asia/index.html lastly visited on April 22, 2023.
[155] https://humans-in-space.jaxa.jp/en/biz-lab/kuoa/ lastly visited on April 22, 2023.
[156] https://www.aprsaf.org/initiatives/kibo_abc/ lastly visited on April 23, 2023.
[157] https://www.nasa.gov/mission_pages/station/structure/elements/htv_about.html lastly visited on April 23, 2023.
[158] S. M. Pekkanen, Space and the US-Japan Alliance: Reflections on Japan's Geopolitical and Geoeconomic Strategy. In: *Japanese Journal of Political Science*, 2022.
[159] https://www.nasa.gov/mission_pages/station/news/orbital_debris.html lastly visited on April 23, 2023.
[160] S. M. Pekkanen, 2022.

authority identified by the Japanese and the US governments for implementing the SSA Agreement is the US Department of Defense, pointedly the US Strategic Command (USSTRATCOM), a further marker of the ongoing stable partnership between Washington and Tokyo.

Besides, given the central role occupied by the Quadrilateral Security Dialogue in the FOIP strategy, Japan has been committed to enhancing QUAD's capabilities in space from a strategic and governing perspective. QUAD's prime purpose of managing and, if demanded, containing Chinese influence in the "Indo-Pacific" region can be easily translated to the international space arena, as Tokyo wishes to involve its Dialogue partners more in its space security concerns[161]. To date, Japanese efforts within the Quadrilateral Security Dialogue have not resulted in known tangible outcomes for what concerns space defense cooperation, apart from recent pledges by the leaders of the four partnering nations to establish a satellite-based maritime monitoring initiative and the opening of a public "QUAD Satellite Data Portal," both still under definition[162]. However, it is worth evaluating some considerations regarding the possible implications of Japanese strengths in space assets and space diplomacy for the future of QUAD in space exploration. Notably, the geostationary orbit position over Japan is precious for data sharing, complementary GPS signal provision, and mutual communication between the QUAD Member States, as it places the spacecraft over the Western Pacific and East Asia with a favorable view of Chinese territory and coastal areas and the same latitude as Australia.

What is more, Japanese satellites can provide an outlook of the zone between Hawaii and Diego Garcia Island, transmitting their data to the US Deep Space Network radars, hence contributing to SSA in such a critical area for international trade and for the four members of the Quadrilateral Security Dialogue[163]. Additionally, Japan envisions the QUAD as an active rule-maker in the definition of global space governance and International Space Law by establishing a multilateral space regime in Asia regarding SSA, Space Traffic Management (STM), and Space Domain Awareness (SDA) and therefore delivering an example of efficient regional cooperation in the space sector[164], considering the overabundance of satellites and space debris that has been surrounding the Earth during the decades after *Sputnik-1* until present days. Specifically, SSA is defined as understanding the vast number of objects in orbit around the Earth, their complex and ever-changing environment, and their interactivity with said environment. To date, SSA coincides with STM and aims to reduce collisions between space objects and between a spacecraft and space debris;

[161] A. Pereira, B. Biddington, R. Rajagopalan, S. Kazuto, The Quad: Implications for Space. In: *2021 IEEE Aerospace Conference*.
[162] https://spacenews.com/quad-nations-unveil-satellite-based-maritime-monitoring-initiative/ lastly visited on May 31, 2023.
[163] A. Pereira et al., 2021.
[164] *Ibidem*.

nonetheless, the lack of established international norms on SSA and STM has hindered any substantial practical application of International Space Law on this matter[165]. Japan has been advocating for SSA and STM regulations since the beginning of the 21st century, when the issue was first highlighted in international forums after the 2007 Chinese ASAT test, and hopes to integrate space sustainability into the forming QUAD space agenda.

Finally, as the United States and its allies have expressed their concerns over the continuously evolving space capabilities of the People's Liberation Army after the 2007 Chinese ASAT test, Tokyo has developed the concept of mission assurance to improve the durability and strength of Japanese space assets considered critical for their inherent dual-use functions[166]. Mission assurance consists of identifying and eliminating the factors in a spacecraft's design, construction, and operation that could prevent the mission's success. Consistently operated by European space industries, as well as ESA and other national space agencies in the European continent, mission assurance has been established by the Japanese government as a mandatory procedure for all kinds of spacecraft launched by JAXA or made in Japan for international space endeavors. Accordingly, mission assurance has also been applied to the Japanese module of the ISS and the scientific experiments part of the Kibo-ABC initiative, which has been mentioned above in this chapter.

Furthermore, JAXA has used Kibo in collaboration with UNOOSA for the United Nations/Japan Cooperation Program on cubic satellite (CubeSat) deployment from the ISS. This initiative, dubbed "KiboCUBE," has allowed educational and research institutions from developing countries with UN membership to design and deploy their CubeSats from the ISS Japanese Experiment Module for scientific purposes. KiboCUBE started in 2015, and thus far, it has consisted of six rounds of project selection and CubeSat positioning, with Indonesia and Mauritius among the States and international organizations which benefitted from the UNOOSA/JAXA initiative[167]. The UN/Japan Cooperation Program on CubeSat has been essential in establishing JAXA as one of the most prominent national space agencies on a global level, allowing Tokyo to stretch its regional and international influence through the technical and scientific soft power of the Japanese Aerospace Exploration Agency and numerous Japanese educational institutions, such as the University of Tokyo.

The Abe administration has also confirmed Japan's commitment to the UN system regarding space exploration with Tokyo's remarkable participation in the Legal and Scientific subcommittees of

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165 https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/space-traffic-management-time-for-action/ lastly visited on May 31, 2023.

166 A. Pereira et al., 2021.

167 https://www.unoosa.org/oosa/en/ourwork/access2space4all/KiboCUBE/KiboCUBE_Index.html lastly visited on April 23, 2023.

COPUOS[168] for conflict-free space exploration and, since the 1990s, international regulation regarding the involvement of private actors in the investigation and use of outer space. The UN General Assembly established the Committee in 1959 for the peaceful use of space, and COPUOS was pivotal in producing the five UN Space Treaties between the 1960s and the 1980s[169]. Despite not being part of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1984), Japan has nevertheless advocated for the respect of the UN Space Treaties and, during Abe's third term as Prime Minister, contributed to the formulation of the COPUOS Guidelines for the Long-Term Sustainability of Outer Space Activities, which were approved by the Committee in 2019 but still do not have any signatories to date[170]. Regardless, Tokyo has championed international management of space debris since the first successful Chinese ASAT test in 2007 and regulated end-of-life measures for satellites through the 2016 Space Activities Act[171], contributing to the formulation of the seven thematic priorities for the 2018 UNISPACE+50 symposium organized by UNOOSA[172]. However, Japan seems not to have put the same dedication toward international discussions over a Prevention of an Arms Race in Space (PAROS) Treaty, which has been held at the UN Conference on Disarmament (UNCD) from the 1980s to the beginning of the 21st century, and again since 2020[173]. The Japanese low profile in the PAROS discourse may be connected to Tokyo's security needs vis-à-vis North Korean nuclear threats and the more recent developments of the Chinese Space Program. Regardless, Japan's overall commitment to the International Space Law framework established by the United Nations is functional to the multilateralization of the diplomatic response to the PRC's growing assertiveness in the "Indo-Pacific" region, which manifested in outer

[168] H. Yoshimatsu, 2021.

[169] The five UN Treaties on Outer Space still constitute the main instruments of International Space Law for the peaceful use of outer space. They consist of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (1967), the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968), the Convention on International Liability for Damage Caused by Space Objects (1972), the Convention on Registration of Objects Launched into Outer Space (1976), and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1984). All the agreements contain a partial test ban regulation regarding mass destruction weapons in outer space (https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html lastly visited on April 23, 2023).

[170] https://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html lastly visited on April 23, 2023.

[171] https://thelawreviews.co.uk/title/the-space-law-review/japan lastly visited on April 23, 2023. Moreover, JAXA has its technical guidelines for debris mitigation based on the research of the Inter-Agency Debris Coordination Committee (IADC) (H. Yoshimatsu, 2021).

[172] Among UNISPACE+50's themes were the future perspectives of global space governance and international cooperation towards low-emission and resilient societies, two targets of Japanese space diplomacy (Y. Horikawa, Space Security, Sustainability, and Global Governance: India-Japan Collaboration in Outer Space. In: *Space India 2.0: Commerce, Policy, Security and Governance Perspectives*, Observer Research Foundation, 2017).

[173] https://www.nti.org/education-center/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/ lastly visited on April 23, 2023.

space with nine successful ASAT tests after 2007 and recurrent Chinese propositions to amend Article IV of the 1967 Outer Space Treaty on collocation and usage of weaponry in outer space[174].

The 2008 Basic Space Law and the consequent reforms also allowed the Japanese government to qualify space among its crucial national security domains. Significantly, 2012 Diet Member Kawai Katsuyuki highlighted national security as one of the five principles of the Japanese space policy, together with diplomacy, industrial development, stimulating the national population, and human evolution[175]. This is evident in the National Defense Program Guidelines published in 2013 and 2018. Both documents call attention to Tokyo's need to assess "gray-zone" situations[176] in the "Indo-Pacific" region with modern defense systems, which include satellite data and advanced C3I capabilities[177]. Indeed, following the 2013 NDPG, Abe pledged before the Cabinet Secretariat his commitment to realizing and enforcing the rule of law in outer space nationally and globally, then promoting an international code of conduct to prevent experiments with ASAT weapons and the collision between satellites. Afterward, in 2014, then Senior Vice Minister of Defense Nakayama Yasuhide reiterated Japan's proposition for more defined International Space Law norms during the second ASEAN Regional Forum (ARF) Space Security Workshop, followed in 2016 by the Cabinet Office adopting Japanese domestic guidelines for the realization and re-enforcement of the rule of law in outer space[178]. The Abe administration further pledged to space security by establishing a dedicated section in the agenda of the 2016 Ise-Shima G7 meeting. However, the final communiqué does not explicitly mention ASAT tests nor any direct regulation of space exploration and utilization[179].

Moreover, particularly regarding space as a geopolitical arena, the 2018 NDPG document explicitly states that "it has become essential that Japan achieve superiority in new domains, which are space, cyberspace, and electromagnetic security."[180] The 2018 Guidelines propose advancements in civil-military coordination for "the safety of the state and its citizens."[181] Practically, this has meant an

[174] Despite Beijing's claims of wanting to expand and precise the prohibitions set by Article IV OST, Japan, alongside the United States and other Treaty Members, refutes China's amendment propositions due to unclear textual formulation, which could lead to misinterpretation.

[175] J. C. Moltz, Asia's Space Race – National Motivations, Regional Rivalries, and International Risks. New York, Columbia University Press, 2012.

[176] The 2013 NDPG document defines "gray zone" situations as "neither pure peacetime nor contingencies over territory, sovereignty, and maritime economic interests." The most striking example of a "gray zone" area for Japan would be the Senkaku/Diaoyu Islands.

[177] C3I capabilities refer to military command, control, communication, and intelligence, constituting an essential part of modern military strategy. Since the First Space Age, satellites have been critical for developing national C3I capacity.

[178] H. Yoshimatsu, 2021.

[179] https://www.mofa.go.jp/files/000160266.pdf lastly visited on April 30, 2023.

[180] https://www.mod.go.jp/en/d_policy/basis/guideline/index.html lastly visited on April 28, 2023.

[181] *Ibidem*.

increase in total space spending from 2010 until 2021's record of $4.14 billion[182], with a significant number of activities placed under the Ministry of Defense (MOD)[183]. The QZSS GPS Augmentation System, mentioned in this study's first chapter, is the preeminent MOD space project implemented under the Abe administration and is set to become a seven-satellite constellation between the end of 2023 and 2024[184]. Following the QZSS System project, JAXA completed the first set of launches in 2018, as required by the 2015 Basic Plan for national space activities, and in 2017 the Cabinet Office proposed a shift to dual use of the QZSS System for Japanese citizens and all civil populations in the "Indo-Pacific" region[185]. Tokyo's aim has likely been to connect Japanese GPS space services to its historical DFIs strategy for infrastructure building in Southeast Asia and to expand its space market to States with less need for traditional Japanese Direct Foreign Investments (DFIs) but less advanced space technologies and assets, therefore aligning space diplomacy with FOIP 2.0.

In this sense, the Tokyo-Hanoi space cooperation is an excellent example of Japan's space diplomacy paired with the FOIP strategy. Asides from more traditional infrastructure-oriented DFIs, Japan granted official development assistance (ODA) to Vietnam for establishing a national space research center, whose construction was completed in 2012[186], and JAXA contributed to developing and launching the Vietnamese CubeSat *Pico Dragon* in 2013 as part of its collaboration with the UN. Given the successful outcomes of these Japanese-financed programs that started during Naoto Kan's presidency and the subordination of Vietnamese satellite building to Japanese expertise, in 2016, Abe extended ODA to Vietnam further, resulting in agreements with Hanoi for satellite data exchange[187] and developing and launching a second Vietnamese CubeSat, *Nano Dragon*[188], which was put into orbit by JAXA in December 2021 but appears not being operative yet. Furthermore, space cooperation between Japan and Vietnam has flourished in education, with continuative exchanges between JAXA and the Vietnam National Space Center (VNSC), additionally demonstrating Hanoi's trust and dependence on the Japanese Space Program to progress its national space assets. Vietnam has also been a precious partner in APRSAF for Tokyo in multilateralizing and competing with China's assertiveness in space as part of regionalizing space activities such as data sharing and maritime satellite-based monitoring in the "Indo-Pacific,"[189] given Hanoi's strategic concerns

[182] https://spacenews.com/japan-budgets-a-record-4-14-billion-for-space-activities/ lastly visited on April 28, 2023.
[183] J. C. Moltz, 2012.
[184] https://qzss.go.jp/en/overview/services/seven-satellite.html lastly visited on April 28, 2023.
[185] J. C. Moltz, 2012.
[186] https://vnsc.org.vn/en/news-events/ground-breaking-ceremony-of-vietnam-space-center-project/ lastly visited on April 28, 2023.
[187] https://vnsc.org.vn/en/activities/international-cooperation/vietnam-japan-reach-deal-on-satellite-data-exchange/ lastly visited on April 29, 2023.
[188] https://vnsc.org.vn/en/news-events/vietnams-nanodragon-delivered-in-japan-ready-to-go-into-orbit/ lastly visited on April 29, 2023.
[189] J. C. Moltz, 2012.

regarding Beijing's general foreign policy and possible "grey zone" areas in the region, especially in the Southeast China Sea.

Nevertheless, the Abe administration encountered several internal issues when managing the new Japanese Space Program and its alignment with national security and the FOIP 2.0 strategy. Tokyo's foremost concern was the lack of governmental and military expertise in space exploration and application. This led to difficulties implementing the conversion to dual use of numerous Japanese satellites and space assets. Moreover, the absence of space experts among the MOD personnel caused damage to Japan's pledge to International Space Law, as Tokyo did not declare in the dedicated UN Register some Information Gathering Satellites (IGSs) and a military optical satellite, therefore violating the UN Convention on the Registration of Space Objects[190].

Another substantial issue encountered by the Abe administration in enacting a government-led militarization of the Japanese Space Program was Article 9 of the 1947 Japanese Constitution, whose original function was to prevent and forbid the re-establishment of a solid military power in Japan. Indeed, as previously mentioned in the present work, during Abe's second term as Prime Minister, the Cabinet Legislative Bureau (CLB) reinterpreted Article 9 to allow the Japanese SDF to participate in an integrated missile defense system with the United States and in other activities, such as information gathering and satellite surveillance, which the Abe administration deemed essential for building Japan's Collective Self Defense strategy[191]. Moreover, space technology, being inherently dual use, usually would present broad and significant benefits for the defense sector, such as cybersecurity and data handling. However, the SDF has not critically advanced in its space assets to date[192], and Tokyo has continued to rely on Washington to solve its most imminent space security needs. Again, this might be imputed to the lack of space expertise in Japanese civil and military institutions; nonetheless, the underlying influence of antimilitarism in Japanese post-World War II society and political practices and Tokyo's bond to the 1947 Outer Space Treaty are crucial factors that have thwarted Japan from further militarizing its space activities[193].

Therefore, the Abe administration established that the most efficient way to develop a *riekesen* in space activities and increase Japanese soft power – and, eventually, hard power[194] - was to enforce

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[190] *Ibidem*.

[191] A. L. Oros, Japan's Security Renaissance. New Policies and Politics for the Twenty-First Century. New York, Columbia University Press, 2017.

[192] The establishment of the Space Operation Squadron within the Air Self-Defense Force (ASDF) on May 18, 2020, has not created significant changes in Japanese military space activities yet, as the Squadron became fully operative only in 2023 (https://www.mod.go.jp/en/jdf/no125/specialfeature.html, lastly visited on April 30, 2023).

[193] A. L. Oros, 2017.

[194] Kenneth Pyle argues that the 2008 Basic Space Law and subsequent Japanese national legislation on space exploration and application are significant steps toward a constitutional reform in a more self-assertive direction (via J. C. Moltz, 2012).

JAXA's ambitious research mission projects and, at the same time, promote space technological know-how import in the ASEAN countries with established economic ties to Japan, as in the case of Vietnam. Accordingly, JAXA's objectives for its first two decades of activity were set in its Long-Term Vision, frequently shortened to "Vision 2025," which sets the targets of undertaking lunar and solar system exploration missions with autonomous Japanese means, including more efficient and stable launch systems, and studying the possibility of life elsewhere in the universe[195].

JAXA's Lunar Exploration Long-Term Plan, established in "Vision 2025," is particularly significant regarding space diplomacy and soft power. In truth, as the Astropolitics of the first half of the 21st century have been played – and certainly will be for the upcoming decades – around the return of humankind to the Moon as the first gateway to human exploration of Mars[196], JAXA's most ambitious project of a series of three lunar missions that started in the 1990s with ISAS' Lunar Program, has been entirely financed by the Japanese government and has demonstrated the advancements of Japanese space technology with the success of the lunar explorer *Kaguya-1*[197]. Nonetheless, given that space competition among the " Indo-Pacific " space powers has escalated in the last decade, JAXA has been studying the feasibility of a Lunar Polar Exploration (LUPEX) mission in collaboration with ISRO since 2016-7[198]. The history of this cooperation and its first results will be the object of the final part of the present chapter.

### *A New Course of the Indian Space Program: Successes and Adjustments*

Space diplomacy constitutes an essential factor in the history of the Indian Space Program. In truth, international cooperation has shaped the development of ISRO and its scientific and social projects ever since the Indian government established the Thumba Sounding-Rocket Research and Equatorial Launching Station in 1963, as narrated in the first chapter of this study. In the 21st century, international cooperation has still been cardinal for the Indian Space Program; however, New Delhi's strategy behind ISRO's global partnerships has shifted from principally scientific and social purposes to achieving security and national prestige objectives, which reflect India's more proactive stance in the "Indo-Pacific" region under Modi's Act East Policy. This attitude shift is noticeable when analyzing New Delhi's bilateral relations with Washington and Tokyo, which have been ISRO's partners since the beginning of the Indian Space Program.

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[195] T. Takahashi, JAXA's Long Term Vision in Science. In: *Nuclear Physics B*, 2007.
[196] M. Spagnulo, The Geopolitics of Space Exploration. Cham, Springer Praxis, 2022.
[197] https://global.jaxa.jp/press/2007/11/20071107_kaguya_e.html lastly visited on April 30, 2023. Pictures taken by *Kaguya* of the surface of the Moon revealed details of volcanic activity on the Earth's only satellite, which led to critical studies on its far-side gravity field.
[198] T. Hoshino et al., Lunar polar exploration mission for water prospection – JAXA's current status of a joint study with ISRO. In: *Acta Astronautica*, 2020.

Bilateral scientific relations between India and the United States of America date back to the 1957-1958 IGY, when NASA provided an observatory camera and a satellite telemetry data reception station to the first Indian space research facilities. Under the Kennedy Administration, when the PRC attacked Indian borders in the short Sino-Indian war in 1962, the US provided financial and technical support to New Delhi to establish the Thumba Sounding-Rocket Research and Equatorial Launching Station and implement the Indian Space Program[199] to include India in its containment strategy against the Soviet bloc. American aid and scientific equipment continued arriving at the Indian Space Program during the 1960s and the 1970s, despite the wobbly relations between the two states caused by Jawaharlal Nehru's and Indira Gandhi's preference for the socialist economic model and the successful 1974 Indian Pokhran nuclear test. Among the most notable Indian space projects completed with American cooperation in these years is the mentioned SITE program for tele-education, which was successfully managed in 1975-1976 using the NASA experimental satellite *ATS-6*[200]. A rather intense collaboration between ISRO and NASA persisted during Ronald Reagan's presidency in the US and Gandhi's last term as the Prime Minister of India at the beginning of the 1980s, with, for example, Indian satellite *INSAT-1B* being launched by the US space shuttle *Challenger* in 1983[201].

Nevertheless, scientific space cooperation between New Delhi and Washington was delayed in the 1990s when the United States halted the handover of cryogenic propulsion technology from the Russian Federation to India[202]. Indeed, the cryogenic propulsion technology of the Soviet/Russian *KVD-1* rocket engine, which had been created and tested in 1964 for a Soviet lunar landing mission, then canceled, would have granted New Delhi unprecedented missile power that could also be used by DRDO and the Indian Nuclear Program, to which ISRO was still tied to. It is essential to notice that at that time, India even then benefitted from international cooperation to expand its scientific and technological knowledge, significantly depending on American and Soviet/Russian support; hence American sanctions on technology export to India severely affected ISRO. Even so, at the beginning of the 21st century, the Indian space agency developed and tested a domestic cryogenic propulsion system, the *GSLV mark II*, using liquid hydrogen supplies from an American private company[203]. Official scientific cooperation between ISRO and NASA also restated, with NASA contributing to the 2008 Indian lunar mission *Chandrayaan-1* with tracking support and several payloads. The

[199] B. R. Guruprasad, Understanding India's International Space Cooperation Endeavour. In: *India Quarterly*, 2018.
[200] B. Harvey, H. H. F. Smid, T. Pirard, Emerging Space Powers – The New Space Programs of Asia, the Middle East, and South America. Chichester, Springer-Praxis Publishing Ltd., 2010.
[201] B. R. Guruprasad, 2018.
[202] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[203] *Ibidem*.

historical success of *Chandrayaan-1*, which confirmed the presence of iced water at the lunar poles, sparked a new global interest in the Moon and accorded ISRO international prestige and a solid partnership with NASA for projects such as the 2014 *Mangalyaan-1* mission to Mars[204] and the India-US Mars Working Group. However, the 2007 Chinese ASAT test and the blossoming space cooperation between the PRC and Pakistan triggered New Delhi and Washington to extend their association to space security, with US President Obama and Indian Prime Minister Modi approving the *NASA-ISRO Synthetic Aperture Radar* or *NISAR* project between 2013 and 2014. The *NISAR* satellite, which will be launched by ISRO in September 2023 and use two different radar frequencies for Earth observation 154, could become an efficient surveillance instrument, hence having a dual use like ISRO's Israeli-made *RISAT-2* 24-hour, all-weather monitoring satellite[205], operative between 2009 and 2021.

Furthermore, to substantially confirm India's international prestige vis-à-vis China's growing investment in civil and military space sectors, Modi deepened New Delhi's security dialogue with Washington, greatly welcomed by the Obama administration, which proposed bilateral ministerial talks on space situational awareness and maritime domain awareness[206]. Nevertheless, no international agreement regarding space cooperation and security has been signed between the government of New Delhi and Washington. Instead, the two parties have preferred to include such activities in their reiterations of the India-US 2+2 strategic dialogue during the Trump administration between 2016 and 2020[207]. This resulted in India's *NAVIC* Satellite System being included in the 2020 US National Defense Authorization Act as an allied structure[208]. In these years, the Modi administration favored the blossoming Indian private space industry via direct commissions for ISRO's civil space program, following the trajectory of the American space sector at perhaps a faster pace and attracting foreign private investment, namely by Elon Musk's SpaceX, which launched *Exseed Sat 1*, a satellite from Indian startup Exseed Space, with a *Falcon 9* rocket in 2018[209].

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[204] The *Mangalyaan-1* mission was a turning point for the Indian Space Program because it made India the first Asian nation to successfully put an orbiter around Mars. NASA's Jet Propulsion Laboratory contributed to the mission by providing navigation and communication support to the Indian spacecraft that began orbiting around the Red Planet two days after *MAVEN*, a NASA spacecraft, arrived in Martian orbit (https://in.usembassy.gov/bringing-u-s-india-space-cooperation-to-the-edge-of-the-universe-special-address-by-u-s-ambassador-to-india-richard-verma-at-the-orf-kalpana-chawl/ lastly visited on May 12, 2023).

[205] R. Q. Ahmed, M. Arif, Space Militarization in South Asia. In: *Asian Survey*, 2017.

[206] https://2009-2017.state.gov/t/avc/rls/2015/238609.htm lastly visited on May 12, 2023.

[207] https://2017-2021.state.gov/secretary-michael-r-pompeo-secretary-of-defense-mark-esper-indian-minister-of-external-affairs-subrahmanyam-jaishankar-and-indian-minister-of-defense-rajnath-singh-joint-press-availability-at-the/index.html lastly visited on May 12, 2023.

[208] N. Goswami, India's Space Program, Ambitions, and Activities. In: *Asia Policy*, 2020.

[209] *Ibidem*.

What is more, since 2014, India has equally implemented its space cooperation with Japan, which stems from the friendship and common goals of Vikram Sarabhai and Itokawa Hideo, the founders of the Indian and the Japanese Space Program, respectively, as noted in the first chapter of this study. Indeed, scientific exchange between the SSTC/ISRO and ISAS flourished during the 1960s and 1970s through short-term training initiatives for Indian researchers and engineers in Japan to produce the first Indian domestic rocket series, the *Rohini*[210]. Moreover, Tokyo assisted New Delhi in establishing the Experimental Satellite Communications Earth Station (ESCES), part of the United Nations Development Program (UNDP), in 1967. Nonetheless, Japanese political and security alignment with the United States and India's nonpartisan stance during the Cold War caused a progressive decrease in scientific cooperation between the two space programs, as Tokyo relied heavily on American support for its NASDA's projects, while New Delhi aimed to maintain bilateral space partnerships with multiple nations from both the Western and the Soviet blocs[211]. Then, in the 1990s, Indian and Japanese space scientific objectives slowly realigned. After the dissolution of the USSR, India became an active member of the Japanese-led APRSAF in 1993, with ISRO co-hosting with JAXA in Bangalore during the 14th session of APRSAF in 2007. However, due to several setbacks in the Japanese Space Programs in the early 2000s, caused by the aftermath of the 1997 Asian financial crisis and dreadful natural disasters[212], such as the 1995 Great Hanshin Earthquake, Tokyo did not pursue any practical collaboration with New Delhi until the beginning of Abe's third term as Prime Minister, in 2015. That same year, during the annual India-Japan bilateral summit for the "India and Japan Vision 2025 Special Strategic and Global Partnership" for the "Indo-Pacific" region hosted in New Delhi by neo-elected Indian Prime Minister Modi, the two counterparts released a Fact Sheet on the ongoing civil activities in space between JAXA and ISRO, highlighting Earth observation, satellite navigation, and space science and planetary exploration as the main objectives of space collaboration between Tokyo and New Delhi[213]. Specifically, regional space safety and disaster prevention, two national priorities for India since the foundation of its space program that became even more substantial after the 2007 Chinese ASAT test, led ISRO and other Indian scientific institutions to partake in APRSAF's Sentinel Asia project, deepening collaboration with JAXA and co-presenting the 2017 APRSAF session with the Japanese space agency in Bengaluru.

Moreover, in 2017, India participated in the second International Space Exploration Forum (ISEF-2) in Tokyo; during the convention, the Japanese government hoped to display a solid and proactive Indo-Japanese leadership. However, the Indian delegation appeared less dedicated to international

[210] B. R. Guruprasad, 2018.
[211] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[212] Y. Horikawa, 2017.
[213] *Ibidem*.

space governance than its Japanese counterpart. India's long-lasting neutral stance in COPUOS and UNOOSA, as well as in other international space conventions, has reflected New Delhi's intention to use these meetings to reach meaningful bilateral partnerships for space exploration and space utilization, especially with affirmed space powers such as the United States, France, and the USSR/Russian Federation[214]. Unfortunately, this approach has distanced New Delhi's space diplomacy from Tokyo's more successful and credible strategy on a global level and prevented India and Japan from finding a shared blueprint for achieving important International Space Law objectives and counterbalancing the growing popularity of the PRC among certain ASEAN and South Asian countries[215].

Besides, Indian space diplomacy seems less effective than Japan's dedicated efforts toward global space governance due to New Delhi's persistent skepticism regarding the UN Space Treaties' efficacy in what India sees today as a multipolar international context[216]. Notably, India has criticized the 1967 Outer Space Treaty and the 1987 Missile Technology Control Regime (MTCR)[217] for their inadequacy vis-à-vis a growing militarization of space by the US and the Russian Federation and emerging space powers such as the PRC and – quite ironically, New Delhi. Therefore, India has advocated for a legally binding and verifiable international framework for outer space governance and space security, with the support of the PICs and the Group of 21 developing countries before the UNCD. Still, Indian propositions have never suggested practical applications to date. Furthermore, Indian behavior concerning the PAROS draft resolution and a Chinese-Russian amendment suggestion to the OST regulation regarding space weaponization has been unclear, causing additional hesitancy from India's global space partners and developing space nations.

After all, New Delhi's cryptical conduct vis-à-vis a more defined international governance on space militarization and space weaponization is connected to what Raja Qaiser Ahmed and Misbah Arif call "the power and prestige factor." [218] Indeed, India has increased the national defense objectives of its space program since the Kargil War in 1999, which posed severe logistical problems to the Indian Army and the Indian Airforce, both active during the conflict. The first intelligence and mapping

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[214] R. P. Rajagopalan, India and Global Space Governance: Need for a Pro-Active Approach. In: *Space India 2.0: Commerce, Policy, Security and Governance Perspectives*, Observer Research Foundation, 2017.

[215] Since 2021, China has offered its space station, *Tiangong*, as a base for international scientific experiments and cooperation with space-developing countries through a UNOOSA program (https://www.unoosa.org/oosa/en/ourwork/access2space4all/China-Space-Station/CSS_Index.html lastly visited on May 15, 2023) that resembles the KIBO-Cube Initiative, bound to finish in 2030, when the ISS will terminate its scientific purposes and start its reconfiguration as a US-led space business hub.

[216] R. P. Rajagopalan, 2017.

[217] Canada, France, Germany, Italy, Japan, and the UK established the MTCR. India joined this international regime in 2016 but still criticizes its "no undercut" policy, under which if one member denies the sale of some technology to another country, all members must adhere to that decision (B. Balakrishnan, Role of Technology in India's Foreign Relations. In: *Indian Foreign Affairs Journal*, 2011 and https://mtcr.info/partners/ lastly visited on May 15, 2023).

[218] R. Q. Ahmed, M. Arif, 2017.

satellite experiments then began in 2001. In 2004, the Indian government established the National Technical Research Organization (NTRO) under the National Security Advisor in the Prime Minister's Office to operate future Earth Observation and Radar Imaging Satellites developed by ISRO[219], such as *Cartosat-2*, launched in 2008, and Sun-synchronous *Cartosat-2B*, put into orbit in 2010. ISRO's partial involvement in militarizing the Indian Space Program evolved after the Chinese 2007 ASAT successful test when DRDO recognized the necessity to improve New Delhi's space defense capabilities. Hence, an Integrated Space Cell was formed in 2008 within the Integrated Defense Services, and a Space Security Coordination Group was set up in 2010 while ISRO and DRDO undertook a shared research program for the *Agni* rocket series[220] and military satellite technology. However, India's steps in space militarization created an action-reaction syndrome in Pakistan and the PRC, shifting the traditional tension in South Asia toward weaponizing space. This chain reaction also occurred during the 2010s, with the Modi administration responding to China's further ASAT tests with new developments of the *Agni* for space launchings and ballistic deterrence toward Chinese territory[221] and an increase in the 2017-2018 Indian defense budget. Modi also implemented a 2012 plan from the Ministry of Defense to create a Border Space Command to surveil Indian frontiers with the PRC, Pakistan, Bangladesh, Nepal, and Myanmar through satellites and other electronic equipment[222]. Moreover, Indian Navy's space assets, renewed in 2013 with the ISRO-developed *GSAT-7* advanced communication satellite, were granted the launch of a new spacecraft, the *GSAT-7R*, also created by ISRO, by the end of 2023.

The Modi administration has attempted to use this tremendous advancement of the military sector in the Indian Space Program to strongly affirm India's new global power status and its right to shape multipolar space governance. Hence, strategic and diplomatic cooperation with Japan again appeared the best choice for New Delhi, given Tokyo's linkage with the UN and prestigious Asian regional forums such as APRSAF. Therefore, for instance, the Indian government has appointed a scientific expert and several DRDO members as part of the delegation to the Indian Embassy in Tokyo since 2015[223], including their roles in New Delhi's more significant effort to cooperate with all the "Indo-Pacific" countries to achieve by 2030 the 17 Sustainable Development Goals (SDGs) promoted by the United Nations. In addition, India's involvement in the technological development of PICs

[219] N. Goswami, 2020.
[220] F. O'Donnell, H. V. Pant, Evolution of India's Agni-V Missile: Bureaucratic Policies and Nuclear Ambiguity. In: *Asian Survey*, 2014.
[221] In 2012, DRDO announced that the *Agni-5* missiles could already easily reach Beijing and Shanghai, posing an actual, historical threat to the PRC (*Ibidem*).
[222] R. Q. Ahmed, M. Arif, 2017.
[223] B. Balakrishnan, Science and Technology Dimensions of Indian Foreign Policy. In: *Indian Foreign Affairs Journal*, 2019.

through Japanese-modeled scientific diplomacy, noted in the previous chapter of this study, has also been encompassed in Modi's SDGs-related foreign policy agenda. Nevertheless, New Delhi's efforts to appear as a friendly space power have been persistently obscured by a progressively closer collaboration between ISRO and DRDO, which culminated – to date, in a successful ASAT test in 2019[224] that displayed DRDO's growing prominence in the Indian Space Program together with an ongoing pattern of delaying ISRO's scientific missions, such as *Mangalyaan-2*, announced by Modi in 2018 for 2023 but hampered to at least 2024[225].

Despite such a clear preference for the Indian space defense program and Modi's imperfect scientific diplomacy in APRSAF and the UN space governance framework, New Delhi's continuous successes in space exploration convinced the Japanese government and JAXA to confirm and improve their ongoing collaboration with India. Notably, *Chandrayaan-1*'s discovery of iced water in the lunar poles and *Chandrayaan-2*'s astonishingly precise maneuvers in the lunar orbit[226] granted ISRO Tokyo's trust and cooperation for developing a joint Japanese Indian LUPEX mission, which will be the object of the following section of this chapter.

***The LUPEX Joint Expedition: Astropolitics, Scientific Diplomacy, and Regional Competition***

At the end of 2017, JAXA and ISRO signed an Implementation Arrangement for a joint project to explore the polar regions of the Moon and gather information about the origin, abundance, condensation process, and distribution of the lunar iced water observed by *Chandrayaan-1*[227] by collecting and returning a sample of lunar polar soil. This Lunar Polar Exploration Mission, which will consist of a lander from ISRO and a rover from JAXA with scientific instruments from both space agencies, is still under development and is planned to launch not earlier than 2025. Nonetheless, the JAXA-ISRO LUPEX mission is already distinctly symbolic of the ongoing alignment of Astropolitics and regional competition in Asia. Indeed, the rising international interest in lunar resources for strategic and scientific purposes, as well as the "power and prestige factor" determined by an advanced national space program, have generated an Asian Moon race between Japan, India,

[224] DRDO declared to have reached ASAT capability in 2012, but the Shakti ASAT test was postponed to 2019 for bureaucratic reasons (N. Goswami, 2020).

[225] Other ISRO's delayed missions include the *Shukrayaan* to Venus (planned for 2023 but set back to 2031), the *Aditya-L1* to the Sun (postponed from 2021 to summer 2023, but still to be confirmed), and the *Gagayaan* human spaceflight program that has been wholly held up and is bound to have its first uncrewed test flights at least in mid-2024. These civil space projects were all announced by Narendra Modi between 2018 and 2019 when the Chinese Space Station was starting to be assembled in orbit (N. Goswami, 2020).

[226] https://www.isro.gov.in/Chandrayaan_2.html lastly visited on May 18, 2023.

[227] M. Ohtake et al., Objective and Configuration of a Planned Lunar Polar Exploration Mission. In: *51st Lunar and Planetary Science Conference*, 2020.

and the People's Republic of China which could equal the political intensity of the first Moon race between the United States and the USSR.

Since NASA's *Clementine* mission in 1994, a wave of lunar expeditions in the first decade of the 21st century has produced considerably valuable scientific data on the Moon. Among the most revolutionary discoveries were the above-mentioned lunar water and variation of the magnetic and gravity fields of the far side of the Moon, made in 2009 by ISRO's lunar exploration program and JAXA's *Kaguya* mission, respectively. In addition, the first lunar probe of the Chinese Lunar Program Exploration (CLEP), *Chang'E-1*, also achieved key results by measuring lunar microwave emissions for the first time in lunar satellite exploration[228]. These pivotal scientific advancements sparked a new global interest in the Moon and its resources, which propelled the implementation of national lunar exploration programs in all the spacefaring states. Specifically in Asia, the new scramble for the Moon coincides with regional competition between Japan and India on one side and the PRC on the other. In fact, after the successful *Kaguya* and *Chandrayaan-1* missions, the political objectives of JAXA's "2025 Vision" and ISRO's lunar exploration activities have aligned under the progressively tighter partnership between the Abe and the Modi governments. Among these targets, the expansion of human enterprises to the Moon to prepare for deep space endeavors is the most significant, for it implies using lunar resources, such as regolith and iced water[229], for strategic and scientific purposes. Hence, it has been vital for Tokyo and New Delhi to advance in their lunar exploration vis-à-vis the astonishing results of CLEP, which has been collecting lunar soil samples for analysis. Indeed, the JAXA-ISRO LUPEX mission was promoted in 2017 to tactically detect lunar resources as a first step toward appropriation and utilization for the construction of lunar infrastructure, a goal established for the Indian Space Program by Modi in 2018[230] and already present in JAXA's "2025 Vision."[231] Moreover, achieving a stable presence on the Moon would grant Japan and India a place among the exclusive "space nations club," allowing them to actively shape the future governance of the Earth-Moon system and deep space while containing Chinese influence on global and regional frameworks, which the PRC has actively pursued in the 2010s through APSCO and UNOOSA. China will seek

[228] https://www.eoportal.org/satellite-missions/chang-e-1#celms-changee-1-lunar-microwave-sounder lastly visited on May 21, 2023.

[229] Regolith (or lunar dust) is a light-weighted but extremely resistant heterogeneous substance that could be used for building space probes and construction materials (A. Lele, An Asian Moon Race? In: *Space Policy*, 2010). Iced water, detected by analyzing the quantity of $H_3$ in lunar soil, could become an excellent propellant for liquid-based launchers and, perhaps more importantly, a resource for human activities in space.

[230] N. Goswami, 2020.

[231] T. Takahashi, 2007.

further ascendancy by implementing the International Lunar Research Station (ILRS), announced at the beginning of 2023[232].

National security is another aspect of the JAXA-ISRO LUPEX project, as the two space agencies are developing instruments with high-level technology for water analysis (JAXA's REIWA, composed of three Japanese devices and one Indian subunit) and a sub-surface sample collection (likely made by ISRO)[233]. As space technology is inherently dual-use, research for the LUPEX expedition has been encouraged by the Japanese and the Indian governments since 2017, also for the security benefits that could derive from implementing scientific lunar exploration. In the case of Japan, given the impact of the Article 9 of the Constitution on the militarization of the Japanese Space Program and the impossibility of Tokyo weaponizing its space assets, the LUPEX mission could expand the Japanese Deep Space Network (DSN), JAXA's system of spacecraft communication ground segment facilities, past its national sites at the Usuda Space Center and Sagamihara to Tokyo's ASEAN space partners and South Korea. DSN technology fundamentally deals with data collection and handling, two increasingly decisive aspects of modern warfare and defense strategy, especially regarding data networking[234] and missile detection. Implementing and amplifying the Japanese DSN system could also help Tokyo maintain its influence as a space power vis-à-vis Chinese globally expanding DSN[235]. For its part, New Delhi's military space program has been actively cooperating with ISRO since the 2010s and is likely to expect advancements in Indian robotic technology through the LUPEX mission. Furthermore, other dual-use technologies under progress by JAXA and ISRO for the joint lunar expedition include sensor and radar technology[236].

Undoubtedly, the most evident achievement of the JAXA-ISRO LUPEX mission would be scientific. Indeed, the intention of the Japanese and the Indian space programs is to test the feasibility of in situ resource utilization (ISRU) for establishing a scientific lunar base, with the perspective of recasting the Moon as an intermediate stop for future human Mars exploration[237]. Given that it will be impossible for a crewed mission to reach Martian soil for the next 100 years at least, nonetheless,

[232] CNSA's Director General of Deep Space Exploration Laboratory Wu Weiren publicized the project, declaring that "all the countries are welcomed [to cooperate] with joint hands." The ILRS will have its basic version by 2028, with an upgraded model made before 2040 and further improvements with application sessions by 2050 (https://www.globaltimes.cn/page/202304/1289758.shtml lastly visited on May 21, 2023).

[233] T. Hoshino et al., Current Status of the Planned Lunar Polar Exploration Mission Jointly Studied by India and Japan. In: *52nd Lunar and Planetary Science Conference*, 2021.

[234] A. Lele, 2010.

[235] As of October 2022, China has several deep-space ground facilities in South America for space situational awareness (SSA), the most discussed by the US for its national security being the Espacio Lejano ground station in Neuquén, Argentina (M. P. Funaiole, D. Kim, B. Hart, J. S. Bermudez Jr., Eyes on the Skies. China's Growing Space Footprint in South America, https://features.csis.org/hiddenreach/china-ground-stations-space/ lastly visited on May 21, 2023).

[236] T. Hoshino et al., 2021.

[237] A. Lele, 2010.

having a national research station on the Moon would boost public and private investment in the S&T sector, indirectly fostering Japanese and Indian FDIs in South and Southeast Asia through manufacturing and competence export, and technical and economic cooperation mechanisms. Furthermore, scientific advancement and a successful LUPEX mission would serve internal propagandistic purposes in line with Abe's effort to turn Japan into a more proactive player in the "Indo-Pacific" framework and with Modi's nationalist political identity. As it happened in the USSR after *Sputnik-1* and in the US during the 1960s until *Apollo-11*'s Moon landing in 1969, a successful LUPEX mission would create sensational momentum among the Japanese and Indian citizens, generating considerable trust in Tokyo's and New Delhi's governments, which in turn would be allowed to push on controversial national reforms, possibly regarding national security and, in the case of India, further institutional support to Hindu revivalism.

Nationalism is also the internal facet of the broader "power and prestige" dilemma that has been pervading Japan and India since the 1990s when China's economic rise and international stance became noticeable against the Asian Financial Crisis and the Japanese "lost decade." As Chinese-made technology slowly but steadily conquered global markets in the 21st century, comparison also hit the prestigious Japanese and Indian S&T sectors, including Tokyo's and New Delhi's national space programs. Hence, the JAXA-ISRO Implementation Arrangement for a LUPEX mission was signed in 2017 to revive both the Japanese and the Indian lunar exploration programs, halted or stagnating after the successes of *Kaguya* and *Chandrayaan-1*, and to restore the prestige of Japanese and Indian technology versus the increasingly fortunate CLEP.

Composed of four phases outlined in the 2016 and 2021/2022 Chinese Space White Papers[238], the *Chang'E* Program has achieved outstanding scientific results that set the PRC among the global powers and the leading space nations. CLEP, in progress since 2007, completed the first orbital phase with the missions *Chang'E-1* and *Chang'E-2*[239] in 2012 and landed the probe *Chang'E-3* on the Moon in December 2013, a first in the history of the Chinese Space Program. Moreover, between the end of 2013 and 2014, *Chang'E-3* provided a high-resolution map of the lunar surface and high-definition images of the Sinus Iridum while researching the elemental composition of the Moon's soil[240]. Then,

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238 http://english.www.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm and https://english.www.gov.cn/archive/whitepaper/202201/28/content_WS61f35b3dc6d09c94e48a467a.html lastly visited on May 22, 2023.

239 While *Chang'E-1* ended its extended operations time in 2009, *Chang'E-2* has been utilized by China National Space Administration (CNSA) since 2012 as a test probe for deep space missions, completing a flyby of Asteroid 4179/Toutatis and reaching 100 million km from Earth in 2015. In 2014, CNSA declared that *Chang'E-2* is expected to fly back to 7 million km from Earth in 2029 (https://www.eoportal.org/satellite-missions/chang-e-2#mission-status lastly visited on May 22, 2023).

240 http://english.www.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm lastly visited on May 22, 2023. The Sinus Iridum, or "Bay of Rainbows," is a plain of basaltic lava forming an extension of the Mare Imbrium and consists of the remains of a large impact crater. *Chang'E-3* was the first lander to map the Sinus.

in another "first" in the global history of space exploration, *Chang'E-4*, part of CLEP's second phase, soft landed on the far side of the Moon in January 2019[241].

Meanwhile, the JAXA's lunar exploration program suffered significant complications in the 2010s, mainly caused by a lack of monetary funds to develop all the planned missions after the 2011 Fukushima Daiichi Nuclear Disaster. Therefore, the robotic lunar missions *SELENE-2*, *SELENE-3*, and *SELENE-X* were already under study in 2011 when the Tōhoku earthquake and tsunami occurred on March 11, 2011, causing a redirection of Japanese national funds to sustain the aftermath of the natural cataclysm and the situation in Fukushima. Specifically, *SELENE-2* aimed to land near the southern lunar pole to acquire knowledge on the origins and the evolution of the Moon in preparation for a feasibility study on ISRU[242]. A similar objective was the one ISRO gave to the *Chandrayaan-2* mission, planned to launch in 2013 in partnership with the Russian Space Program. Nonetheless, the project had to be rescheduled multiple times between 2013 and 2019, when the probe was finally put in orbit with an Indian-made LVM3 rocket due to Russian difficulties in developing a lander in time for the decided schedule[243]. Besides, *Chandrayaan-2* is still operative in lunar orbit, but the probe could not complete its landing operations on the Moon's southern pole, having lost its lander in an attempt to fulfill its task in September 2019.

Despite having launched two lunar missions in 2018 and 2019[244], these unfortunate setbacks in JAXA's and ISRO's lunar exploration programs, especially regarding the *SELENE-2* and *Chandrayaan-2*, vis-à-vis the continuous triumph of CNSA's Moon missions, certainly contributed to the establishment of the objectives of the LUPEX joint expedition, which is set to launch in summer 2023 onboard Japanese launcher H3 from JAXA's Tanegashima Space Center[245]. Furthermore, highlighting the importance of the Japan-India space cooperation framework for New Delhi, in 2019, ISRO announced that the probe *Chandrayaan-3* would serve as the lander for the LUPEX expedition, practically fully integrating the joint lunar mission with Tokyo among its national space initiatives. In the case of Japan, the stable partnership between JAXA and Mitsubishi Heavy Industries has been an effective means to convince the Indian government to deepen space cooperation between Tokyo and New Delhi with this specific mission, given Modi's several attempts to regulate and further privatize the Indian space manufacturing sector[246], albeit without substantial results due to confusion

[241] https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=2018-103A lastly visited on May 22, 2023.
[242] T. Hashimoto et al., Japanese Moon Lander SELENE-2. Present Status in 2009. In: *Acta Astronautica*, 2011.
[243] https://www.isro.gov.in/Chandrayaan_2.html lastly visited on May 22, 2023.
[244] The reference for India is to the *Chandrayaan-2* mentioned above, while Japan launched its *Smart Lander for Investigating Moon* or *SLIM* in 2018.
[245] T. Hoshino et al., 2021.
[246] C. Giri, India-Japan Lunar Bid: Targeting Tech Gap? (https://www.gatewayhouse.in/india-japan-lunar-mission/ lastly visited on May 22, 2023).

and bureaucratic competition among the Indian Space Program[247]. In addition, considering that it has been known among national administrations since the mid-2010s that the ISS will terminate its scientific functions in 2030, it is highly thinkable that the Abe administration sought space cooperation with India to propose an alternative and permanent framework for space cooperation with Japan, as the KiboCUBE initiative is bound to end with ISS' scientific life. Beijing has already placed its national space station as a valid substitute for the Japanese research module for international cooperation in the "Indo-Pacific" and internationally within the UN structure. In this sense, choosing India as a partner for a joint lunar exploration mission was the most logical and strategic move for Tokyo, forasmuch as collaboration with New Delhi could contribute to expanding APRSAF's governance in the "Indo-Pacific" region, as well as implementing QUAD's scientific diplomacy facing growing Chinese expertise in the research sector.

Should the LUPEX probe victoriously soft land on the lunar south pole, Japan and India would restore their prestige and technological power at odds with the Chinese lunar exploration program before the *Chang'E-6* and *Chang'E-7* lunar polar missions would be launched by Beijing in 2025 and 2026[248].

***Conclusions***

The Japanese and the Indian Space Programs have evolved differently since the beginning of the 21st century. Indeed, on the one hand, Tokyo has developed internationally appreciated science diplomacy, relying on Asian regional forums such as APRSAF and the United Nations framework for space cooperation; on the other hand, New Delhi has chosen a rapid militarization of its space program and a progressively tighter collaboration between ISRO and DRDO for missile buildout and satellite technology. Nevertheless, both JAXA and ISRO have been dealing with internal difficulties and the rise of the Chinese Space Program, specifically regarding lunar exploration missions that brought significant strategic and scientific advantages to the People's Republic of China, granting Beijing a space power status that only Japan and India have had in Asia for decades and manifesting further security tensions in the region, especially concerning lunar infrastructure and dual-use technology applications. Hence, to re-establish Tokyo's and New Delhi's technological power and political prestige among their "Indo-Pacific" partners, in 2017, JAXA and ISRO signed an Implementation Arrangement for a joint lunar pole exploration mission. The LUPEX expedition, constituted of an Indian-made lander and a Japanese-made rover, will launch in the summer of 2023 and, if successful, will allow Tokyo and New Delhi to achieve further credibility among the "Indo-

[247] F. O'Donnell, H. V. Pant, 2014.

[248] https://english.www.gov.cn/archive/whitepaper/202201/28/content_WS61f35b3dc6d09c94e48a467a.html lastly visited on May 22, 2023.

Pacific" framework and in the international arena, setting a new level of competition in Asia for regional space hegemony.

## *Conclusions*

The present study aimed to investigate the Japanese Space Strategy adopted since the beginning of the 21st century, especially during the premiership of Abe Shinzo from 2012 to 2019, to captivate India into the Free and Open Indo-Pacific framework to balance the constantly growing technological and political power of the People's Republic of China (PRC) through scientific cooperation in space exploration. To date, the most evident result of the deepening space collaboration between Tokyo and New Delhi is a joint lunar polar exploration robotic mission, the LUPEX project, between the Japan Aerospace Exploration Agency (JAXA) and the Indian Space Research Organization (ISRO), favored by the Abe administration and the Indian government in 2017. The LUPEX expedition, which is set to launch in the summer of 2023, would collect and return a sample of lunar soil from the south pole of the Moon to confirm previous significant scientific findings by the Japanese and the Indian lunar exploration programs regarding lunar water and lunar volcanic activity. If successful, the LUPEX mission would precede a set of Chinese robotic expeditions with similar objectives for the second half of the 2020s, allowing Japan and India to form an Asian space governance in their preferred regional and international frameworks.

This work wishes to insert the deepening space cooperation between Tokyo and New Delhi, dating back to the establishment of the Indian Space Program, in the global phenomenon of scientific diplomacy within the strategic international competition in the "Indo-Pacific" region, following the realist concept of science and technology (S&T) as two of the most indicative factors of national power and prestige. After this paradigm is the interpretation of Space as the fourth dimension of human activity, therefore of technological and military competition; furthermore, withstanding the

growing dependence on human life and activities from S&T, states have been increasingly pursuing smart power to produce and use knowledge and information in a way that can enhance and progress its defense capabilities while also targeting domestic and international populations with an appealing societal and cultural model. The present study considers the above-mentioned theoretical paradigms in the examination of Japanese space diplomacy in Asia vis-à-vis the growing technological power and political influence of the People's Republic of China and the analysis of India's response to Japan's efforts during the 2000s and the 2010s, as well as New Delhi's coincident attempts to broader its engagement with international space governance and space diplomacy.

The first chapter of this investigation explores the history of the Japanese and the Indian Space Programs, the first two Asian nations to enterprise space exploration. The Japanese Space Program blossomed in the 1950s, after the San Francisco Treaty lifted the legal restriction on the domestic airplane and rocket buildout, from the research of Itokawa Hideo, a professor at the then Institute of Industrial Science at Tokyo University, and of his Avionics and Supersonic Aerodynamics Research Group (AVSA). The success of AVSA's experimental rockets – the first launcher prototypes wholly designed and developed in Japan, convinced the Japanese government of the validity of Itokawa's project, and the space activities of the University of Tokyo were grouped in the Institute of Space and Aeronautical Science (ISAS) in 1959, while the National Space Development Center of the Science & Technology Agency was set up as the institutional agent for Japanese space endeavors. Both organizations were financed by the Japanese government and shared similar research objectives. Nonetheless, a series of failed launches and the consequent proposal from the United States to utilize a US-made rocket to orbit the first Japanese satellite in the 1960s caused an irreparable severance between Itokawa and the Japanese government on the direction the Japanese Space Program should have followed. Indeed, on the one hand, Itokawa and ISAS believed that Japan needed to learn how to develop space technology domestically without assistance from NASA; on the other hand, the Japanese government leaned on accepting the US proposition to reduce the costs of rocket development partially and to demonstrate political allegiance to Tokyo's most eminent ally. Hence, Itokawa left the Japanese Space Program in 1967. Without his founder, ISAS succeeded in orbiting the first Japanese test satellite, *Ohsumi*, only in 1970 by launching it on a Japan-made *Lambda 4S* rocket from the Uchinoura Space Center. The first Japanese scientific satellite, *Tansei*, was put into orbit by ISAS in 1971 with a *Mu-4S* rocket to study plasma waves and density, electron particle rays, geomagnetism, and electromagnetic waves[249]. In the meantime, the Japanese government established

[249] B. Harvey, H. H. F. Smid, T. Pirard, Emerging Space Powers – The New Space Programs of Asia. the Middle East, and South America. Berlin, Springer Praxis, 2010.

the Space Development Council in the Prime Minister's Office to delineate Japanese policy on space exploration.

The Space Development Council evolved in 1968 in the Space Activities Commission (SAC), also under the Cabinet of the Prime Minister, with the tasks of drafting policies, submitting autonomous proposals to the Prime Minister, and bringing more structure to the Japanese Space Program. Then, in 1969, the Japanese government set up the National Space Development Agency (NASDA) by combining the National Development Center of the Science & Technology Agency with the Radio Research Laboratory of the Ministry of Posts and Telecommunications to open the Japanese Space Program to commercial use, while ISAS would continue to develop scientific space missions and domestic rocket technology on behalf of the University of Tokyo[250]. This division would last 30 years, causing Japan to practically sustain two different space programs, albeit none with military scopes. Finally, the Japan Aerospace Exploration Agency was established in October 2003 and reunited NASDA's and ISAS' projects under its direction. In any case, despite such extended separation between US-supported NASDA's activities and ISAS' independent research, the Japanese Space Program achieved impressive results in the 1970s, 1980s, and 1990s, such as a "solar" series of scientific satellites, *Yohkoh* and *Hinode*, and the *Sakura* communication satellite series[251]. Moreover, the prolonged fortune, impressive scientific achievements, and technological innovations granted Japan participation in the International Space Station as a full-fledged partner and the status and prestige of being the first Asian space nation.

India rapidly followed Japan in establishing its national space program under the guidance of physician Vikram Sarabhai, who had reached international academic celebrity in the 1940s with his doctoral thesis on *Cosmic Ray Investigations in Tropical Latitude*, completed at Cavendish, United Kingdom. Sarabhai founded the Physical Research Laboratory (PRL) in India in 1947. In 1953, he successfully presented the PRL's proposal for an Indian contribution to the International Geophysical Year (IGY) to the Indian government. Like Itokawa Hideo, who would serve as an external advisor for the Indian Space Program in the early 1970s, Sarabhai believed that India needed to develop domestic space technology; moreover, in Sarabhai's vision, New Delhi ought to dedicate its space program to solving the economic, environmental, and social issues that had been affecting Indian population through educational telecommunication programs and with total approval from the governmental Indian National Committee for Space Research (INCOSPAR), Sarabhai and the PRL established the Thumba International Equatorial Sounding Rocket Facility in 1964. The Thumba project was also supported by the United Nations, the United States, the French national space agency

[250] *Ibidem*.
[251] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

CNES, Japanese industries connected with the Japanese Space Program, and the USSR Hydro-meteorological Service[252]. India's first successful telecommunication program was initiated by Sarabhai in 1969. It became known as SITE (Satellite Instructional Television Experiment), broadcasting educational programs to India's then-most backward areas via NASA's ATS-F satellite. After Sarabhai died in 1971, the Indian Space Program held on to his vision and victoriously completed SITE and other educational telecommunication projects in collaboration with the United States and the European Space Agency (ESA)[253]. In the meantime, the Indian Space Program parted from the Atomic Energy Authority, under which INCOSPAR had been posed, and the Indian Space Research Organization was founded in 1969. ISRO's first satellite, the *Aryabhata*, was orbited in 1975 from a Soviet cosmodrome and worked until 1980. It was followed by *Bhaskhara-1* in 1979, and *Bhaskhara-2* was also launched from a Soviet facility. All of ISRO's initial satellite missions had scientific purposes. During the 1970s, the Indian Space Research Organization also developed a domestic version of the American Scout rocket, the solid-fueled Satellite Launch Vehicle or *Rohini*, which was launched for the first time from the Sriharikota Launching Site in 1980, carrying a homonymous communication satellite. Other successful ISRO projects include multiple series of Remote Sensing satellites used by the Indian government for earth observation and the Indian National Satellite System, or INSAT, for communications and weather monitoring[254]. However, ISRO's progress in rocket science was frequently halted by US bans and sanctions principally caused by the emergence of the Indian Nuclear Program and the institution of India's Defense and Research Development Organization (DRDO), in charge of military technology. Notwithstanding the US changing attitude towards Indian rocket technology, ISRO has been recognized as a prestigious national space agency, and its educational programs are still highly considered among the international scientific community.

The Japanese and the Indian national space programs were established for the civil use of space technologies and acquired international visibility for their scientific deep space missions. However, as the People's Republic of China boosted its national space program with dual-use purposes at the beginning of the 21st century, Japan and India felt the exigency to restructure and reorganize their space sectors to meet new security issues blossomed from Chinese technological advancement and growing political influence in South and Southeast Asia. Therefore, with the 2008 Basic Space Law, Tokyo reorganized its national space objectives and initiated the dual-use application of satellite

[252] B. R. Guruprasad, Understanding India's International Space Cooperation Endeavor: Evolution, Challenges and Accomplishments. In: *India Quarterly*, 2018.
[253] B. Harvey, H. H. F. Smid, T. Pirard, 2010.
[254] B. Harvey, H. H. F. Smid, T. Pirard, 2010.

technology in cooperation with the United States and India in the second half of the 2010s[255]. On the other hand, New Delhi did not rely on national legislation to reframe the blueprint of the Indian Space Program, choosing to promote joint research programs between ISRO and DRDO directly instead[256]. As a result, Japan and India eventually chose the path of 'normal' space powers, linking their technological advancement in space exploration to their respective grand strategies, analyzed in the second chapter of the present work.

Indeed, as this study investigates, Japanese Prime Minister Abe Shinzō and, later, Indian Prime Minister Narendra Modi centered their foreign policy theories around the geopolitical concept of the "Indo-Pacific" region, coined by German geopolitician Karl Haushofer in the 1920s and the 1930s. During his first term as the Japanese Prime Minister, Abe transformed Haushofer's Sino-Indian geo-cultural construct into the Japanese-led and economy-centered Free and Open Indo-Pacific (FOIP) strategy to expand Tokyo's political influence in a vast area comprising the Indian and the Pacific Ocean. However, this rendition of FOIP was unsuccessful among the ASEAN Member States, mainly due to its resemblance to the 'Greater East Asia Co-Prosperity Sphere' policy under which Imperial Japan conquered and enslaved the countries of Southeast Asia during the 1930s and the 1940s[257]. Instead, the second version of the FOIP strategy, outlined by Abe during his terms as Japanese Prime Minister from 2013 to 2020, proved more fortunate, as it was linked to active cooperation between Japan and its regional partners for infrastructure and technology development and, given the expanding Chinese territorial and maritime claims vis-à-vis several ASEAN countries and Tokyo in the 2010s, legally-bounding international security measures. Besides, to effectively multilateralize the 'China problem,' FOIP 2.0 also relied on the resurgence in 2017 of the Quadrilateral Security Dialogue (QUAD) between Japan, the United States, Australia, and India, initially established in 2007 to contain Chinese assertiveness but then abandoned also due to Abe's resignation from his position the same year. The QUAD, categorized in the present work as an expansion of multiple minilateral security alliances to build a bloc to influence regional order following Paik Wooyeal's and Park Jae Jeok's analytical model[258], has allowed Tokyo to coordinate its China policy with its partners more efficiently and create an assorted set of security associations in the "Indo-Pacific" region to compensate the indecisive posture of the United States toward Asia in the 2010s. In this sense, India became Japan's dependable ally to compete with the economic and military expansion of the People's

[255] H. Yoshimatsu, Japan's Asian Diplomacy – Power Transition, Domestic Politics, and Diffusion of Ideas. Crawley, WA, Australia, Palgrave MacMillan, 2021.
[256] R. Q. Ahmed, M. Arif, Space Militarization in South Asia. In: *Asian Survey*, 2017.
[257] M. J. Green, Line of Advantage. Japan's Grand Strategy in The Era of Abe Shinzō. New York, Columbia University Press, 2022.
[258] W. Paik, J. J. Park, The Quad's Search for Non-Military Roles and China's Strategic Response: Minilateralism, Infrastructure Investment, and Regional Balancing. In: *Journal of Contemporary China*, 2020.

Republic of China in the "Indo-Pacific" by implementing its Act East Policy, promoted by Indian Prime Minister Narendra Modi since his first term in 2014. The Act East Policy is based on infrastructural and economic cooperation between New Delhi and the ASEAN countries; substantial assistance has been coming to India from the Japanese private sector that has encouraged investing in India's domestic infrastructure and joint projects with ASEAN by Abe's administration and its successors. Moreover, India has been seeking technological and security partnerships with the Pacific Island Countries (PICs) to grow New Delhi's maritime outreach, given the consistent Chinese commercial and military presence in South Asia[259].

Nonetheless, Japan and India have had to include the 'US factor' in their national strategy, as Washington frequently changed its attitude toward its Asian partners and the PRC during the 2010s. Even if the second Obama administration and the Trump administration embraced the geoeconomic notion of "Indo-Pacific" in its 21st-century rendition established by Abe Shinzō, the former remained more cautious and unbiased about the possibility of including the People's Republic of China in the US-led "Indo-Pacific" regional order; on the other hand, the latter fiercely indicated the PRC as the paramount contender of the United States unipolarism not only in Asia but on the global level, hence apparently aligning with Japanese and Indian aspirations and security concerns. However, the chaotic Asian foreign policy and economic sanctions over trade and space technology toward India thwarted any significant progress of the Trump administration with the Japanese and the Indian governments, who chose to strengthen their bilateral partnership in place[260]. In this context, space exploration and space militarization have fiercely emerged as global trends in international relations since the beginning of the 21st century, especially after China's first crewed space mission in 2003 and the first successful Chinese Anti-Satellite (ASAT) test in 2007.

In truth, as the third chapter of the present study examines, in Asia, the militarization of space officially started in 2007 when the PRC completed an ASAT test on its dead satellite from the *Fengyun* series[261]. While Japan has used the Asia-Pacific Regional Space Agency Forum (APRSAF) and its long-standing reputation as a 'peaceful State' among the United Nations to contrast a Chinese military and infrastructural expansion in space through international cooperation on technological development and contributions to the enforcement of International Space Law, India has responded to the escalating regional tensions by militarizing its national space program to compensate New

[259] J. P. Panda, India and the Pacific Ocean: The "Act East" Between Trade, Infrastructure and Security. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.
[260] B. Glosserman, An Administration at War with Itself: The New US Strategy for the Indo-Pacific. In: *Geopolitics by Other Means. The Indo-Pacific Reality*, 2019.
[261] J. C. Moltz, Asia's Space Race. National Motivations, Regional Rivalries, and International Risks. New York, Columbia University Press, 2012.

Delhi's lack of international recognition in space diplomacy. Regardless of criticism toward the Indian approach to global space governance by the international community, as a member of APRSAF and the QUAD, India has attempted to support these regional frameworks for space cooperation more actively by participating in Japanese-led initiatives such as APRSAF's 'Sentinel Asia' and proposals for coordination between the partners of the Quadrilateral Security Dialogue on Space Situational Awareness (SSA) and Space Traffic Management (STM). Nonetheless, given that the PRC continued succeeding in technological innovations and science diplomacy in the space sector during the 2010s, Tokyo and New Delhi converged on scientific collaboration to contain Chinese influence and establish a space framework in line with their respective grand political strategies, namely the Free and Open Indo-Pacific and the Act East Policy. Whether this alignment will succeed will be decided by the outputs of the LUPEX joint mission between JAXA and ISRO, scheduled to launch in the summer of 2023 and aiming to compete with the outstanding Chinese Lunar Exploration Program, whose upcoming missions have been planned for 2025 and 2026.

The present investigation unveils potential limitations deriving from limited access to political and strategic data concerning the most recent developments of the Japanese and the Indian Space Programs, as well as the limited time available to answer the inquiry of this research. Hence, these obstacles may have influenced the findings of the present study. The lack of up-to-date information on the upcoming LUPEX mission and future joint space activities between Japan and India is due to the relevance of said details for the scientific and technological developments of Tokyo's and New Delhi's national space programs; indeed, as this work wishes to highlight, space technologies have become strategic for Japan and India as a consequence of their inner potential for civil and military use. Therefore, our estimates of the political value of the LUPEX expedition and its scientific results may underestimate the impact this joint Lunar Polar Exploration mission could have not only on Asian space governance but on the 21st-century global scramble for deep space in general. The other limitation of the present investigation is the bounded time available to elaborate an answer to this research's inquiry. Given the complex and dynamic essence of the "Indo-Pacific" framework and the evolutionary nature of space exploration and space politics, it will be undoubtedly necessary to further analyze the relations between future developments of Asian national space programs and the unfolding regional competition in the "Indo-Pacific" region as additional political and scientific data will be available for research purposes. Besides, as Space is the next human frontier, it will be interesting to observe future developments of space cooperation and space competition in the "Indo-Pacific" region, especially given the Japanese effort to support allied novice space-faring nations such

as Vietnam[262], which could serve Tokyo to balance Chinese prestige further. Concerning India, in the hope of witnessing better attention from the international academic community to New Delhi's space endeavors in the future, upcoming evolutions of the military branch of the Indian Space Program will be decisive in determining how effective Indian scientific diplomacy will be among the "Indo-Pacific" countries vis-à-vis the PRC.

Finally, this study focused on space cooperation between Japan and India, the first two Asian states to establish a national space program during the second half of the 20th century, with the strategic purposes of competing and containing the Chinese rising regional hegemony in Asia. The scientific collaboration between Tokyo and New Delhi in space exploration, which to date produced a joint lunar exploration mission as its most valuable output, is meant to enhance Japan's and India's position as space power in framing an Asian space governance which Tokyo and New Delhi envision to reflect their national strategies for checking Chinese influence in the "Indo-Pacific" region. As Space continues to attract international investment and participation, future events and further research will determine the aftermath of space cooperation between Japan and India for the "Indo-Pacific."

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[262] J. C. Moltz, 2012.

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