

# CHINA-PAKISTAN SPACE COLLABORATION: EFFECTS ON INDIA'S SPACE POLICY AND REGIONAL STABILITY

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## ABSTRACT

Recent years have seen increased space cooperation between China and Pakistan with worries in India, as well among the rest of South Asia. A historical background, strategic incentives and postulating of the China-Pakistan space alliance are looked at in this study. It further assesses how India has pivoted to ensure a strategic equilibrium in space policy and speculates broader stability consequences within the region. It is argued that this partnership is not only hampering Indian space ambitions but also exacerbates regional tensions and a regional arms race.

## INTRODUCTION

China and Pakistan have recently deepened their partnership in space technology, creating a powerful alliance that has attracted the world's attention. By working together, China provides Pakistan with advanced space capabilities, helping Pakistan grow in areas like satellite technology and space exploration. This partnership also strengthens China's influence in South Asia.

However, this collaboration has led to concerns in India, which has its own ambitious

space program. India now faces the challenge of adapting its space policy to keep up with the advancements of its regional neighbours. The growing space ties between China and Pakistan are reshaping the competition in South Asia, raising important questions about the region's overall stability and security. This study will look at how China and Pakistan's space alliance affects India's space goals and what it means for peace and stability in South Asia.

## Objectives of the Study

This research seeks to investigate the emerging space collaboration between China and Pakistan as well as its impact on India's space policy and regional stability both directly & indirectly. The study aims to answer three pertinent questions:

1. What are the strategic drivers behind China-Pakistan space cooperation?
2. How has India reacted to that partnership?
3. What does it mean for the geopolitics of South Asia/Security?

Importance of Space Collaboration in Geopolitics

Space has become an essential domain for technological innovation, military utility and national pride. Space technologies

collaboration are so often geopolitics in nature; they drive this higher order power structure across regions. China-Pakistan Space partnership is not just the technological one but also the strategic one that is changing power in South Asia. This collaborative effort has wider implications on the balances of power, defense postures, economic integration and state-to-state relations between the countries concerned.

## Methodology and Scope

This research is qualitative study based on secondary sources (government reports, academic journals and a lot of media articles). Bearing between the years of 2000

and beyond (peak time of space activities in the region) It also incorporates cases studies and comparison to understand in depth what happens

### Research Questions

1.How does China-Pakistan space collaboration impacts mother China , The Scope of Indian Space Policy in Defence & Strategic planning?

Answer: China-Pakistan Space partnership has upped the US level of security considerations for India more particularly on the issue of advanced space technologies implications to military functions as Missile guidance, surveillance and reconnaissance. Which also made India to create its own anti- satellite (ASAT)/satellite Communications system of space program that this includes enhancements Surveillance. Since these are enabled capabilities which tilt the playing field in their favour, India space strategy is different since then and now space, their own stuffs and forbes alliances with other space fiefdoms, i.e USA and Japan

2.What are the china-pakistan space relations? How it affects regional balance of power in south asia area .

Answer: The China-Pakistan space partnership adds to the military cooperation between two countries countries and will allow these pressures India, potentially an arms race in space by enhancing discouraging its own people and deterring while Pakistan is bolstered with more confidence in its abilitiess One which could only be causing regionally more unstable.

3.What is the effect China Pakistan Space collaboration for Indian Space Policy and regional stability in South Asia?

Answer: The China-Pakistan space collaboration follows with Indian space program being boosted to military capable and indigenous systems. The collaborative space exploratory partnerships such as co-launch of satellites and other higher technology; are encroaching upon India's supremacy in Space. Meanwhile, it has exacerbated regional competition driving more spending in dual-use space technologies and counterspace capabilities by India. This escalations appetite to militarise the space race, raising the risk of

exacerbating regional security dynamic. Yet, competition is not all bad either — it raises the bar on innovation where we require regional regimes that keep space peaceful.

### 2.Background

History of Space Programs in China, Pakistan, and India China

The China National Space Administration (CNSA) established its space programme in the 1950s and

has since reached various milestones such as moon exploration and manned spaceflights.Over the past two decades, the program has grown from humble satellite launches to the unprecedented Tiangong space station and Chang'e lunar missions and put China in category similar to major players of international space exploration.

China has poured resources into its space program; viewed as crucial for national security, economic development and international style by the Chinese government.

The launch of the Tianwen-1 Mars mission in 2021, as well as the creation of a modular space station, provide evidence that China has come out of the block as a player in space technology.

China space ambitions are not just explorative but deeply rooted in China's military desires. Space is increasingly becoming a domain of strategic domain presence down by the Chinese military who see it as a critical domain level for modern war-faring.

The maturation of anti-satellite (ASAT) capabilities and the declaration of a space force symbolize the intent of China to protect its strategic interests in outer space and diminish perceived threats from other nations, specifically the United States, and India.

### Pakistan

SUPARCO (Pakistan's Space and Upper Atmosphere Research Commission) — Formed in 1961 but has had to catch up due to lack of resources, it has sought help of Chinese in satellite development.

The launch of PakSat-1R in 2011, in a sense launched Pakistani space capability where Sino-Pak collaboration becomes achievable. Historically, Pakistan's space program has

been aimed at applications such as communications, remote sensing and meteorology in general. Yet there have areas — both strategic challenges on national security per se and with respect to technological capacity — to which the nation is beginning to place greater emphasis on space technology. The collaboration with China has also helped Pakistan access the technologies and know-how they need to fulfill its ambitious space ambitions.

China has been a double-edged sword for Pakistan in terms of technological help. It has helped Pakistan advance its space development, but caused alarm over dependency on Chinese technology and influence. Increasing collaboration in space being part of a larger strategic alignment between the two countries that could play out in the region's security dynamics

### **India**

An Indian Space Research Organization (ISRO), spun off in 1969 from Department of Space (DOS), ISRO is now a global player in the field of economical space missions and this is evident through its MOM (Mars operated mission) milestone. India focus of its space programme goes from civilian uses to strategic capabilities according to aspiration of Indian to be a regional power. ISRO has built a suite of operational satellite systems for communication, navigation and earth observation which are essential to the scope of civilian and military applications. India's recent triumphs with the launch of Chandrayaan and Mangalyaan are not just a sign that the nation is technologically capable but also a step up in the global space-political hierarchy. From beginning — India space policy has been anchored on building indigenous technologies, with it getting the autonomy to practice strategic independence.

India's space program has also been shaped by the exigencies of geopolitics. Space as a strategic domain recognises the increasing interest in dual-use technologies and investments have boosted such capabilities. India is already ramping up its capabilities in building next-generation satellite systems for reconnaissance and surveillance as New Delhi looks to take a sharper look at the

geostrategic landscape in South Asia blazed out by competing tensions on both its borders—China and Pakistan.

The creation of the Defence Space Agency (DSA) in 2019 is an indication of how committed India is on embedding space capabilities in its national security architecture.

### **Key Milestones in China-Pakistan Space Collaboration**

•PakSat-1R: China launched communication satellite in 2011 which will facilitate improved communication system (Pakistan) and give many sectors reliable services. The said satellite has made telecom infrastructure in Pakistan better and also helped in delivering education & healthcare to sectors.

•Remote sensing Satellites: cooperation on Earth observation Satellites for agriculture disaster management and surveillance (FDA). The satellites would provide Pakistan the ability to track its agricultural production, vulnerability against disasters and help in enhancing security.

•Collaborations: Deals made about satellite navigation and dual-use technologies showing some strategic ties. These joint ventures allows technology transfer and ability building, that will help Pakistan to industrialize its indigenous capability in space technology.

### **South Asia Regional Stability Review**

Longstanding rivalries (most notably between India and Pakistan) have been a part of South Asia for a long time. These technological advances reinforce the existing rivalries in this space which can often exacerbate existing tensions considering that these technologies have civilian applications but have substantial military potential. Space collaborations carry strategic overtones that go far beyond the practical improvements in technology and affect the posture of forces & the nature of diplomacy. Space technology in the turbulent world of geopolitics much is beyond few nations in this region, and integrating space technology is an important aspect in determining interactions between these entities.

### 3. China-Pakistan Space Collaboration

#### Agreements and Joint Ventures Overview

The Chinese satellite cooperation in development, remote sensing, and navigation technologies with Pakistan has signed several Memorandum Of Understandings (MoUs). Key projects include:

- PakSat-1R: China kindly launched a communication satellite for Pakistan which was an improvement in communication and the satellite helps numerous industries services across sectors.
- Remote Sensing Satellites — Partnerships in earth observation satellites support to agriculture, disaster management and surveillance so that Pakistan can better track its resources and respond to emergent situations.
- Cooperative Research Initiatives: Across satellite technology and applications research, promotes technological diffusion with strategic motivations strategic motivations!!

#### For China

Making a counterweight to India, (China to Pakistan): Pakistan is seen as strategically aligned with China in countering India's power and presence in the region — its only neighbor facing a common threat of terrorism.

Between the partnership China will be able to expand its footprint in South Asia and when push comes to shove will have a beach head in the Indian ocean.

- Deepening Belt and Road Initiative (BRI): The BRI tied in by space technologies facilitates connectivity and economic integration, connecting trade routes and infrastructure work. Most space cooperation is presented as part of the BRI initiative, which seeks to establish a trade and economic partnership network in Asia, and eventually beyond
- Balancing US Influence: Chinese proximity to India will enhance China to balance US footprint/influence in South Asia, by framing itself as an essential force in regional geopolitics. It is an integral part of China's more extensive plan to shape a worldwide multipolar order in which it can play a bigger role.

#### For Pakistan

- Facilitating Resource Development: By coordinating with China, Pakistan gets access to the latest space technologies enabling its advancements in other sectors. It is of the essence for Pakistan because this partnership allows it to consolidate in developing a strong space program supporting both civilian and military uses.
- Less Dependence on Western Technology: The Plan of partnering with China does lower the dependence of Pakistan for technological support from the West, towards self reliance. The move is especially important, given Pakistan's long history of abysmal experience in accessing technology from the West.
- Pakistan Eases into the Advantage in Rivalry with India: Strengthened space capabilities put Pakistan strategically in its prolonged rivalry with India, and through this negotiate for power balance against India. Advanced satellite systems and surveillance/reconnaissance capabilities can make Pakistan's military preparedness as well as strategic planning adequate.

### 4.India's Space Policy: Evolution and Strategy

#### Historical Development

Beginning at a civilian level India was mainly interested in space work for communication and weather prediction. However, space as a domain of strategic nature has changed the game fully. The first space-based technology has enabled India realize need for space technology in national security matters and led to the 1998 nuclear tests followed by some regional disputes. The realisation has led India to be able,indeed build a capacity that could potentially serve both civilian and military purposes of space policy.

#### Current Objectives and Capabilities

- Progress of Indigenous Satellite Systems: India has taken big strides in the development of its own satellite constellations, like Regional navigation by Indian Constellation (NAVIC) which serve as a strategic guarantee to autonomy and less dependency on the foreign systems. A similar ability will be important for India to



go operational on its own in event of geopolitical tensions. This includes not only the enhancement of India's navigation power, but has also placed a strategic leverage in military operations providing accurate positioning & timing during different defense circumstances; from NAVIC.

•**Manned Space Missions:** The Gaganyaan program seeks to send Indian astronauts into space, and has long been a major goal in India's space ambitions as they build their technological name for the world. These scientific and technological achievements are an addition to the national prestige as well since this is the first time that the country could improve its scientific worth. It will make India one of the few countries with mature capabilities for human spaceflight if the Gaganyaan is executed well and thereby strengthen its strategic status as a space power.

•**Space domain militarisation India:** With the reason that it is several especially one of many emphases that the Indian governance is seeking vigorously to acquire space warfare capabilities or Anti Satellite —such as the ASAT projects the designed a weapon on national security while confronting threats not from neighbours. WASAT Test Success in 2019 made it Adequately evident to India that in space interests it stands Unapologetic to protect itself. This capability also allow ( as low level nation) India to keep off the front-line threats by near peer or peer adversaries who might attack their strategic ASAT assets.

India also focused on the China-Pakistan space partnership with a bigger story setup around dual-use techs and international collaboration.

**Key responses are as follows:**

•**Strengthen U.S. — Japan Partnerships:** Seeking to magnify its strategic partnerships — the U.S. and Japan especially — to technology transfer as well as collaborative satellite missions that will help in building India's space assets. These partnerships are crucial for India to be able to invest in new-age technologies and improve its strategic nuclear deterrent.

The Quadrilateral Security Dialogue (the "Quad") among like-minded nations has also given prominence with joint initiatives for space security.

•**Rapid Deployment of Radar or Communications Satellites:** India is pouring money into new satellite systems that promise to give real-time intelligence and help India keeps pace the region with advanced military capabilities.

•**High-Resolution Imagery Satellites and Upgrade Advanced Communication:** We Need Imagery at this level to maintain situational awareness & Operational Readiness These breakthroughs allow for India to keep a close eye on things happening in its neighbourhood and act quickly and appropriately against new threats.

•**Improvement of Space Based Missile Defence Systems:** India plans to increase spacebased missile defence — it is trying to breach the potential threats from adversaries and will result in national security. In this regard, the study of warning systems and tracing technologies for the detection and eradication of missile threats before they fall on Indian soil is included. Integrating space into the Indian strategy of defense is therefore a proactive way of protecting national interests.

**Impact on Regional Stability  
 Geopolitical Implications**

**China-Pakistan Space Alliance:** A fissure in the power politics of South Asia It is a threat to India's tech edge and muddies its strategic calculations. By strengthening capabilities in Pakistan as well as expanding the geographical footprint of Chinese power, the alignment increases friction between India and China inevitably meaning tensions will likely rise with the chance of an arms race. This partnership has wider implications on South Asian military and diplomatic relations, the economic cooperation etc.

Pak's improving capabilities with the help of Chinese support could result in some changes being made to military-strategy amongst Indians. The perception of a more powerful threat form Pakistan seems unlikely to stop India from even speeding up its own military modernization arsenal that will create a taste for an arms race in the region. This competition cycle can set up a razor's edge of security, with any miscalculation or misperception leading possibly to a hot war

Space dual-use technologies and arms race

The use as well of dual-use space technologies further escalates the risks of an arms race, since these assets can be useful for both civilian and military purposes. For example, remote sensing satellites for surveillance and targeting may be used in conformance with a given policy while others raise concerns. The risk of misinterpretation regarding the data the satellites provide might enable further militarized responses for military action within an already fragile region.

Firing an Admittedly expensive weapon at the space age — space advanced nations that invest in next gen space technologies make misunderstandings and misjudgements more probable leading to a spike in risk of conflict. The Space Race is not just about having the most number of satellites in orbit; it also entails offensive missile capability and anti-satellite systems of course. ASAT development by both India and an increasing capable China, with China aiding Pakistan in filling her technology tank further muddies this already murky stew. This is a dynamic that could result in a competitive arms race between nations to march ahead of one another.

South Asia faces economic and security concerns

Space collaboration between China and Pakistan are likely to be a page out of China-Pakistan Economic Corridor that could take focus away from developmental priorities to more spending muscle into the very military enhancing economic disparities and regional strains. By concentrating on military power instead of socio-economic development, it may stop the solutions required now for poverty, education and health etcetera from coming fast enough to undermine regional stability. Third, if space technology is used and still focus on high militarization what would be the ramifications of basic services plus infrastructures would be vulnerable with scanty socio-economic fabric in South Asian countries .

China-Pak-Space partnership has economic ChinaPakistan space partnership beyond military budget consequences.

It will also shape trade and economic engagement further. As China trade more with Pakistan preference is no longer going economic dives with India, perhaps because

Asia will read more fragmented at a global- or regional-level. The resulting fragmentation could in turn hamper integration efforts in this region and further fewer areas for collaborative economic progress.

Secondly, the ripening of armament will result in new naces of tensions on border areas that are very countrys that suffer from the trade routes and economic activities. Trade routes and supply chains being disrupted going forward will not be good for confidence so it may snap supply chains/foreign investment where the economy was poor. The security factors that weave interdependently with economic considerations will be absolutely pivotal soon on South Asia.

### 5.Future Outlook Potential Scenarios

•Scenario 1: Hardened Rivalry- India-China-Pakistan space race grows more frenzied with challenger satellites initially push military militarization further chaos. The result: heightened fears of military competition and risk of war, b/c countries put advanced military pursuits above cooperation. Arms race in space escalates to increased probability that nations will act militarily rather than peacefully as a means of achieving objectives. Where the probability becoming real, the consequences could be apocalyptic for this region in an environment of imminent miscalculation or accidental conflict posing serious problems.

•Scenario 2 — Regional Cooperation: Space cooperation agreements underpinned by peaceful exploration are developed, a reduction in tensions. To fully play out this scenario would require an active role of diplomacy and confidence-building measures among the countries in question in the context of cooperation rather competition. Policy measures including cooperative missions to satellites, common research projects and open sharing of information on its space activities could reduce the potential for misunderstandings and prb©pare a friendly climate for conflict. Regional dialogue platforms on space related issues can be institutionalized for cooperation and peaceful uses of outer space.

•Situation 3: Technology decoupling – In an effort to space self-sufficiency, the country

level faces decoupling in technology as states are forced to build separate systems. That decalogue may result in more competition to create indigenous technologies, due nations focus on reducing dependence on foreign allies. Despise the self-reliance we pursue could be an expensive technological balkanization, as countries build their own capabilities in isolation from one another to meet shared challenges. This decoupling serves to obstruct the solution of global problems like climate change and disaster response, both of which need international collaboration.

## 6. Policy Recommendations

### For India

- Invest in Upcoming Space Techs: India must plough further funds in cutting edge research and development of space technology to keep its pace and make sure national security is in order. That will involve, for example, big bets on AI and machine learning, as well state of the art materials + space exploration and defence capabilities that can be capitalized in India. India can show the way and establish its global leadership in space by making innovation and technology creation its top priorities.
- Deepen International Cooperation: International collaborative partnerships with other space-faring nations can counterbalance the China-Pakistan axis and thus reinforce India's position in space technology. Satellite development, space exploration and collaborative missions can create a more collaborative atmosphere in region. India's image in the international space community may also be boosted by interacting with international organizations and organizations and taking part in multilateral initiatives.
- Raise Public Awareness and Education: Developing the public awareness of necessity with space technology and its applications can give the boost-ramp for innovation down the line to think and inspire next scientists as well as engineers for future. Space science and technology education initiatives can be result oriented, focused to build a talent pool to take India towards its space aspirations.

### For the Region

- Create Confidence Building Measures: Efforts to reduce the risks of error and miscalculation in an already stable orbiting environment will not only forestall an arms race but also lower the risk of war. More dialogues, joint exercises and [transparency in] space operations will lead to a more secure space domain. Crises communication protocols help to temper the temperature of any situation and deter retaliation, as you cannot have crisis communications plan but limited information.

- Foster transparency about space activities: Better transparency on nation s capabilities and activities in outer space in addition is to build trust among the states will to reduce arms race and encouraging regional stability by making communication more flexible and cooperation better.

- Clarify: While helping the others just in case of same happen ing transit, facilitate research & collaboration on things common like Space Debris and environmental monitoring.

- Advocate for Regional Space Collaborative: South Asian countries should look for ways to work together on space, for co-mitigating the shared challenges such as disaster management, climate change and resource provisions. Coordinated projects on remote sensing and earth observation can aid regional cooperation for peaceful development uses of space.

We can say , The China-Pakistan space collaboration has far reaching and deep impact on India and South Asia at large. More than just expanding Pakistan's space capability, this partnership is geopolitically important given it ramps up regional competition: fresh security issues make stability in South Asia harder. Already a complex partnership which entailed collaborative satellite projects, technology sharing and space infra development is further mired in the geopolitics of antagonism between India and Pakistan. India and Pakistan, with both countries trying to use space technology for military, intelligence and strategic gain, will increase probability of space getting another domain of conflict if they enter into such collaboration.

India is growing inpace capabilities, with Pakistan now bristling with Chinese tech

and know-how that is a naked slap in the face to Indian regional hegemony. From the establishment of high tech satellite systems and potential for missile guidance to surveillance, intelligence, both could upgrade Pakistan's military capabilities and expand existing dimension of its national security strategy. India perceives an emerging strategic problem in Pakistan, which is being facilitated by China-increased military and intelligence capabilities that could potentially endanger defence preparedness and security of situation.

The heightened competition in terms of technology could heat up a potential arms race in space, aggravating what is already a fraught relationship between two of the nuclear haves

Therefore, India needs to tweak its space policy to counter the changing space security threat perception arising from China-Pakistan Space collaboration. The Indian way should mean pulling up own legs by making its rocketry become strong, with special emphasis on making Indian satellites for civilian as well military ends. The Indian Govt is required to fund research in advance of how it can build more secure and resilient space assets, and stay ahead of the technology curve in that region. In addition India should take forward its space strategic partnerships with space faring countries, be it leading powers like US, Russia and EU to increase the available strategic options in the backdrop of intensifying competition.

This provides only a portion of the future of South Asian geopolitics that does not lie only with competition in space. It will also require the skill of maintaining space collaboration and the ramifications that will have for regional security and development to some extent by India, Pakistan and China. Given space technology as core to both economic and security need, it is necessary that the competition and cooperation are well-whipped up in this regard by these nations. This technology can play a great role of boosting national development such as telecommunications and weather forecasting, climate change observation, disaster management etc. It is, therefore, vital to highlight the

non-militarization in space while generating awareness over militarization and its implications.

To attain regional stability, the South Asian nations need to look for cooperative constructs that would probe dialogue and transparency of space domain. Diplomatic approach will be the only way to reduce tensions and towards using space technology for the good of all nations in the region. Regional collaboration on space--such as joint missions to space, common infrastructure of satellites or in scientific pursuits--could be expected to pave way for relationships and cooperation between states. Regional countries can form common grounds on space domain related matters including coordination on management of space debris, protection of satellites and, last but not the least do not weaponize space.

In addition to dialogue, it is equally imperative for the nations to follow international norms and guidelines that exist for the responsible use of space technology. Spacewise the possibility of miscalculation or conflict among space assets grows as South Asian space capabilities expand. Hence, the establishment of unambiguous and visible rules of engagement as well proper verification means is essential to prevent the militarization of outer space. Multilateral forums like the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) could be instrumental for such endeavors; after all, spacefarers gather there to talk peace in outer space and governance.

Technological innovations, strategic alliances and regional undercurrents are going to define the face of space exploration as well space cooperation in South Asia in near future. In the process of evolving further, India and Pakistan along with other regional stakeholders need to contribute to a shared vision of the region making space for peaceful applications so as the thoroughly balanced and secure environment exists for each country involved as we move forward. South Asia is able to reap the benefits of space technology and reduce risks associated with militarization and competition, in the end leading towards security and broader development goals of the region as a whole through



transparency, dialogue and common initiatives.

### **7. Expanded Analysis of Strategic Motivations**

#### **□ National Security: What role it plays**

The strategic logic of the China-Pakistan space cooperation is inherently based on national security. For China, bolstering its partnership with Pakistan represents a counterbalance of India's determined unconventional military build-up and strategic dealings with Western nations, especially the U.S. India as a perceived regional rival fuels Chinese support for Pakistan to keep it as an important South Asian ally. This is further complicated by the fact that India is reinventing itself as a military power- capable of missiles and space too.

Pakistan as part of a collaboration with China views it as a vital commitment to defend itself from India. The enduring background of conflict and rivalry between India to that with Pakistan has resulted to a security dilemma: the feeling that its military developments are perceived as direct threats by sorts of neighbouring country. In partnership with China, Pakistan aspires to increase its deterrent and to be something substantial in the region.

The partnership besides opening access to more technologies also is a geopolitical insurance policy for Pakistan in the face of India's assertive aggression.

#### **□ Economic Considerations**

China-Pakistan space collaboration is also influenced by weighty economic considerations. The partnership goes beyond the military; it also includes economic development projects that use space technologies. Take the utilization of remote sensing satellites, for example; to monitor agriculture and disaster management – it can greatly enhance economic absorptive capacity in favor of Pakistan (among others). Pakistan, by boosting up agricultural output and enhanced disaster response will be able to work on the toughest socio-economic problems that have always dogged the country.

On the other hand China considers working with Pakistan as a way to increase its economic footprint over the region. The Belt

and Road Initiative (BRI) is an umbrella for all joint space technology projects to supply the integrated economy, through trade and infrastructure development. Full of life - the economic dimension of this partnership not only enhances bilateral relations but also aids in paving China as key player within South Asia economics.

### **8. The Consequences of Technological Developments**

#### **Emerging Satellite Technology**

China-Pakistan collaboration on the technology front resulted into a lot of improvements in satellite work — which are enormous security implications for the region. For example the creation of remote sensing satellites in developing countries would permit Pakistan to have a better surveillance of its borders and monitoring of activities taking place in neighbour countries linking/along the border such as foundations of military installations.

This capability is extremely important at the moment due to the ongoing tensions with our neighbours, India where timely intelligence can guide policy decisions; Beyond the fact that the common development of satellite navigation systems is a big step towards Pakistan's getting more powerful military. Pakistan can also have more autonomy in its military with cuts on dependency towards foreign navigation systems. Considered in this light, the technological leap it represents does not merely stiffen Pakistan's hand in defence but also goes a long way in confounding India's security calculus as of now.

#### **The Militarization of Space**

Increased coordination in space technology between China and Pakistan, creates fears of a militarized space. Moreover the procurement of very advanced systems, both by national space based geo-spatial observation & anti-satellite capabilities will only further increase tensions in space. These dual-use technologies, are these tools that can not only be used for civilian purposes but also will serve as military platforms blurring peaceful exploration from the competitive side.

India having assessed the perils on the militarization side, has started developing its space capabilities at an accelerated pace.

India has incorporated anti-satellite systems as well as advanced reconnaissance satellites to ensure the presence of its national interests space. Arms Race in Space Technology = Add tension and also risks of miscalculation = Conflict as nations can often misunderstand the intent behind the advanced for another.

### 9.Regional and Global Implications

•International Actors in the Role: Implications of the China-Pakistan space pact go beyond South Asia, which has also caught attention across global powers. The U.S especially has this partnership with a lot of red, as the region is challenged by their influence. The U.S. aim to counterbalance China's assertiveness in Asia has encouraged a strengthened U.S relations with India. The competitive nature of this geopolitical competition has resulted in enhanced military ties between the U.S and India—adding another layer of complication to South Asia's security landscape.

Also other regional actors like Russia and Iran might want to join hands with Pakistan & China against U.S again. There is a delicate geopolitical environment that needs to be understood in South Asia, as any action/ engagement of International actors can impact regional stability .

•Space Collaboration in the Future: Looking further down the line, space collaboration in South Asia will hinge on how well States manage their complex relations. China-Pakistan relationship may come into many difficulties for India but also offers space to engage \*in cooperation.\* Space exploration, disaster response and environmental monitoring could be used as the nucleus for countries to begin setting aside differences and learn to trust one another. The positive development of framing joint projects for regions facing similar problems may ease competition and encourage a sense of cooperation.

As space is getting more congested with satellites and other man made technologies, responsible behaviour should be an imperative for operation in space. Transparency and communication will have to be at the top of the nation's list to keep from misinterpreting each other causing a regional flashpoint. Creating norms and agreements for the conduct of space

activities can help pave the way for a more stable, secure environment in the region.

### Emerging Technology Pillars

Emerging technologies are advancing so very quickly like AI (AI), machine learning and big data analytics to create a new era in space exploration and warfare. They would enable that satellites also have their fair share of augmentation technology to analyze data, hence providing real time decision making. For example, AI can filter through huge chunks of satellite pictures in a split second to offer faster and more correct assessments of military movement or natural calamity.

Given the out-of-the-way collaboration between China and Pakistan on space technologies the incorporation of such emergent technologies will be instrumental to further domination. This could also increase the complexity in India's calculus of security and it may have to spend more on similar technologies for keeping its competitive edge. That war of developing these technologies, could cause an arms race to get fiercer with each competitor trying to beat the other

The Space Debris Management is Crucial With the proliferation of satellites in orbit so does space debris (bad stuff flying around that probably shouldn't be there) matter more. Satellites and debris collisions are a threat to not only the national security assets but also to civilian operations within space. Regional proliferation of satellites in China-Pakistan could raise concerns on sustainability of space activities in the long terms likely through some kind of cascade effect.

India has taken the first steps towards space debris management realizing that there is a big need to develop technologies for space situational awareness and counter-measures against space debris.

South Asian collaborative efforts can be instrumental in combating space debris and hopefully lead to

partnership on other space related activities, as well as mitigate the risks with this increasing number of satellites.

Frameworks for "the responsible use of satellites and mitigation of debris are essential to sustain sustainably future space activities in and from this region.

## 10. Conclusion

Implications for India & South Asia The China-Pakistan space collaboration raises important question for China on its second theatre of Indo-Pak space collaboration and for the whole South Asia. While it adds to Pakistan's capabilities and complicates India's security situation; it is also a reminder that strategic nimbleness and self-initiated engagement are essential. India must develop its space policy in the manner to get rid of the challenges it faces working with this one but also ensure peaceful use of outer space.

South Asia's geopolitics of tomorrow at the very least will depend on how skillfully these countries negotiate space collaboration, and its linkage to security and development. Countries in the region can help reap the rewards of space technology while avoiding the risks of competition and militarisation by engaging in dialogue, transparency and collaborative efforts. Inevitably the interplay of technological innovation, strategic collaboration and regional dynamics will determine what future holds for space exploration and collaboration in South Asia but for one aim to be realized: A more stable and prosperous region.

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