



Emerging Military Technologies and Strategic Stability in South Asia Rethinking Nuclear Deterrence in the Age of Artificial Intelligence

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ARTICLE INFO	ABSTRACT
Submission: February 25, 2026 Revised: March 10, 2026 Accepted: March 23, 2026 Available Online: April 13, 2026 Keywords: Emerging technologies, strategic stability, security dilemma, Cyber-attacks, nuclear deterrence and Autonomous weapons Corresponding author: Imran Ahmed Email: imimran6005@gmail.com	The South Asia region is already highly volatile and the use of emerging technologies is changing the strategic and security dynamics in the region particularly between India and Pakistan. Disputes, rivalries and history of wars and skirmishes in the region already exist. Avert Nuclearisation of South Asia provide Strategic Stability that is challenged by new technologies like AI, LAWS, Air defense systems, UAVs, Hypersonic Missiles.,space technologies , Quantum technologies, cyber-technologies etc. This study aims to explore the implications of these technologies in the context of security and strategic environment of South Asia with the help of structural realism and classic realism theories or lenses. Required and relevant data for this study secondary and analysis thematically, qualitative mode of investigation is applied to complete investigation. Emerging technologies posed strategic threats to Pakistan's national security and decrease the nuclear deterrence, and also provide opportunities to Pakistan. One of the ways to transform challenges into opportunities for Pakistan is to invest in technologies that can enhance its economic and military capabilities. Unless a different definition is used, the term 'strategic stability' in the context of a security dilemma can be understood as the non-evolution of the security situation

Background of study

Prevent Nuclearisation of South Asia and bring strategic stability in a volatile region, South Asia, with Avert crate. In the presence of Pakistan-India's rivalry and the lack of any conventional balance of power or even huge power gap, there has always been a sense of strategic instability between the two. Here are a number of genuine reasons behind this instability that is between India and Pakistan. The rivalry is there in spite of the history, territorial claims, ideological differences and Indian aspirations to rule the region. In terms of economy, military and territory, India is the biggest country in the world, and the biggest population (Muhammad, 2026).

Significance of study

This research study has a significant importance in the strategic literature in South Asia and two out of it are more significant for the national security policy of Pakistan and academic importance. This research study systematically investigate the strategic implications of emerging technologies especially AI and its integration to defense and military sector. In the context of India and Pakistan and their rivalry this study investigate the impacts integration of emerging technologies specially AI on the existing strategic stability of South Asia (Aurangzeb, 2026).

Limitations

This study focus on limited themes like as strategic stability, emerging technologies, challenges and opportunities for Pakistan. In Indian Pakistan context It emphasizes on strategic stability in the Indian Pakistan strategic environment not in south Asian region which comprises of eight countries.

Scope of study

This study was limited to strategic impact of emerging technologies particularly AI in south Asia with a specific context of India and Pakistan, and the impact of China and US prevent and covert alliance with both countries and provision of technological support as well as their assistance. Not all and random emerging technologies but key emerging technologies which are integrated to military and defense sector. The key technologies will discuss are AI, cyber tech, Air defense systems, nuclear submarines, unmanned Arial vehicles (UAVs) anti-satellite weaponry high stealth fighter jets , hyper sonic missile systems and , communication and surveillance technologies (Jabeen, 2026)

Main objective

- The goal of this study is to know the challenges to tactical constancy in South Asia and possible opportunities for Islamabad in the environment of disruptive technologies as under:
- To understand the important disrupting technologies in South Asia.
- To examine the challenges in the context of Pakistan's national security and strategic stability at the specific level,
- To describe Opportunities for Strategic Advantages and Sustainable Development

Main question: Research Questions

What are the most significant disruptive technologies in South Asia and their impact on strategic landscape?

Sub question

- In the context of Pakistan's rivalry with India what are specific challenges disruptive technologies pose to the national sanctuary and tactical stability of Pakistan?
- How disruptive technologies can ensure strategic stability in South Asia through their adoption and adaptation in Pakistan?

Literature Review

The integration and development of disruptive technologies, such as AI, Cyber capabilities ballistic missiles, hypersonic missiles systems, unmanned systems, stealth fighter jets, advance air defense system like as S-400 and homemade system Akash and Barak 8, short range MANPAD and L-70 artillery guns, nuclear submarines and second and their strike capabilities as well, space technologies, are changing nature of the wars and national power in South Asian region in context of India and Pakistan and their historical rivalry (Syed ,2025). This literature review examines the existing literature and analysis how emerging technologies possesses challenges and opportunities and which are the most important technologies in South Asian region strategic stability. Explaining existing strategic balance of power between India and Pakistan, upcoming challenges by disruptive technologies, strategic implications opportunities and challenges and opportunities for specially Pakistan, It includes identifying critical research gap in existing literature. Due to India's proliferation of AI and AI backed distractive

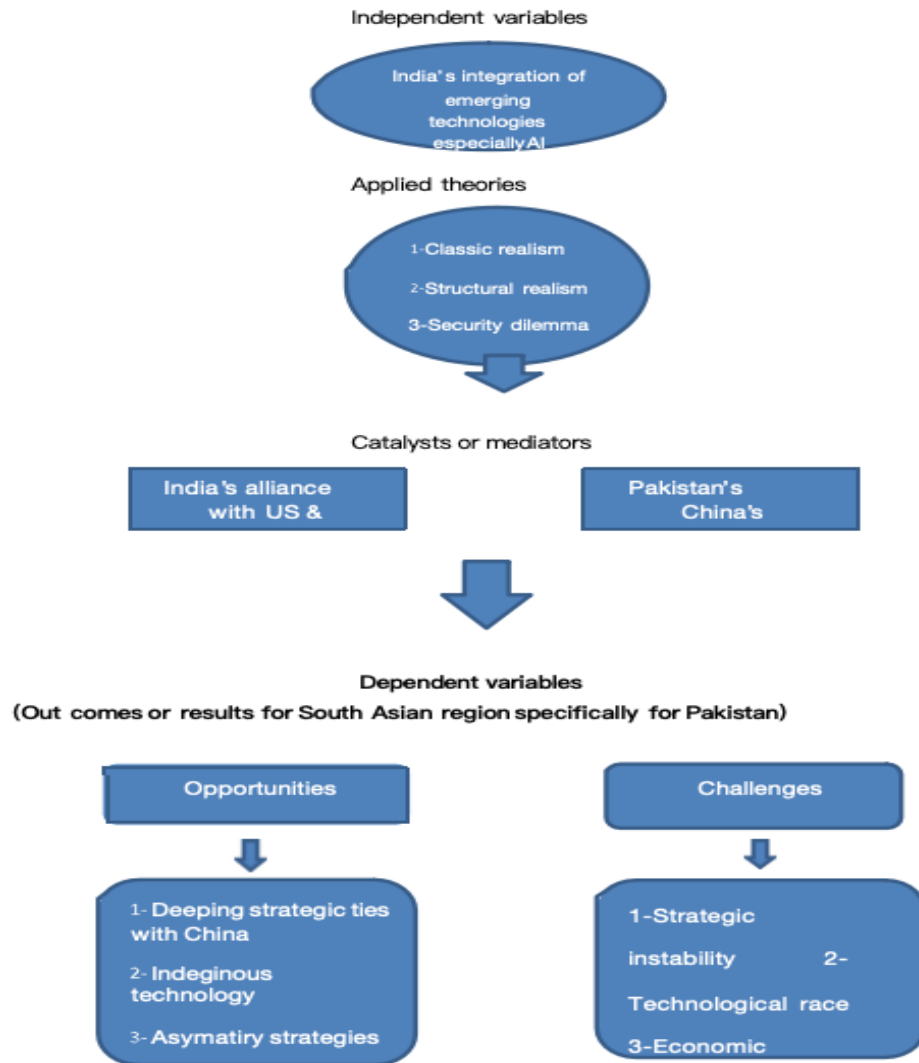
technologies posed direct threat to Pakistan's national security. The Pakistan has no other and the most important security shield or grantee except the nuclear deterrence as there is a big gap in conventional power between the two countries. Pakistan will lose its second strike capability as a result of the integration of AI backed technologies such as UAVs, AI enable anti-submarine weaponry, high hyper sonic missile. This is a new scenario that is hurting the idea of 'credible minimum deterrence' which is one of the cornerstones of Pakistan's nuclear strategy to deter India. The Artificial The world has witnessed a change in warfare with the advent of intelligence (AI) and other advanced technologies. The South Asian security saw a change in the paradigm of military affairs with the use of AI system in their weapons and technology (Ashraf & Kayani, 2023). Strategic stability is on stake due to India's thrust for power creates instability by the help of emerging technologies, (Steinbruner, 1978). The policy of Pakistan towards nuclearization is 'credible minimum deterrence' which is geared towards ensuring strategic stability. Nuclear deterrence is basically feared of destruction or mutual assured destruction. There seem to be three general impacts of nuclear weapons on the interstate relationship. To begin with, nuclear weapons give the nuclear state an 'infrangible guarantee of its independence and physical integrity (Muneeb, 2025)'. Second, mutual deterrence between enemy states with nuclear weapons restricts the use of force while limiting the use of force limits the use of total war. Third, nuclear weapons have now enabled the weaker states to ensure their own security against the stronger powerful states by changing the 'offence defence' equation in the favour of the defence (Rao, 2025). The part of the doctrine of nuclear use that concerns nuclear deterrence is fundamental—when and why a country might use nuclear weapons (Aurangzeb, 2024). There has been some support for defensive or no first use. Some have said that defensive or first use is not wastage. The principle objective of the Indian nuclear arsenal is to ensure that no state or entity will be able to use or threaten to use nuclear weapons against India or its military forces (Hussain, 2020). India has budgeted 120 million \$ on the militarisation of AI in 2018, and it is budgeting 200 million \$ per year over the next five years (total 600 million \$) (Sehgal, 2024).

Theoretical Framework

For this study primary lenses are both classic and structural realism theories to a comprehensive investigation, both theories of International relation and security comprehensively analysis the topic "Strategic implications of emerging technologies in South Asia challenges and opportunities for Pakistan". Classic realism explain the power politics in terms of human selfishness and egoism national interest balance of power and anarchic structure of international system. As Hans Morgenthau (1940-80) said "realistic' diplomacy, based on analysis of balance of power and the need to promote national in (HEYWOOD, 2011). According to this classic realist theory there is no any central authority in the world and world is full of anarchy and in the absence of authority every state try maximize its power or establish alliance or balance its power with its rivals to ensure its survival in anarchic international system. Within realist paradigm and in context of South Asia and specially Indian Pakistan context India is rapidly advancing its military by adoption emerging technologies are posing decisive challenges to alter exiting nuclear deterrence and sense of balance of terror and achieve strategic dominance in South Asia. This theoretical frame work can predict an emerging technologies integration and advancement in between India and Pakistan.

Conceptual framework

I am doing this study for investigate the strategic implications of Emerging technologies in South Asia in context of Pakistan Indian rivalry. For analysis I design variables divide them in two categories dependent and independent. Independent variables are India's high pace integration emerging technologies into their military and especially which can affect the strategic landscape of South Asian region, although indirectly they are also dependent but not as result of these variables (Emerging technologies or ETs). Like as Air defense systems which India purchase for Russia S-400 , Ballistic Missiles ,AI, Cyber capabilities , Unman Arial Vehicles stealth fighter jets , hypersonic missiles systems, nuclear submarines ,second and third strike nuclear capabilities e.g. And in result of these independent variable some in some dependent variable are also exist as I said earlier which are result possible outcomes or results of independent variables . The strategic Implications for Pakistan which we can divide in to sub categories like as economic, military or national security, Political and, diplomatic e.g. National security or militarily we can study threat level caused by Indian ETs integration and advancement and find best responses.



Challenges

Economic challenges and capacities respond to Indian ETs investment because there is a huge economic gape between countries, institutional challenges and access to international market of emerging technologies.

Opportunities

Although every challenge has opportunity in itself it is natural fact. Pakistan can develop strategic partnership with anti-Indian countries like as china to counter it, enhancing its asymmetric strategies.

There is a relationship is exist in between India's ETs adaptation and Pakistan's strategic challenges which can I describe blow

1. Indian rapidly integration ETs put economic pressure on Pakistan and its defense budget
2. Pakistan will influence by those countries which will provide its necessary ETs to strengthen its position
3. Indian adoption directly challenge existing security environment in region especially strategic balance between both India and Pakistan.

It put challenges to almost all domains from Economic to military, foreign policy to diplomacy.

Research gap

Existing literature is mostly focused on global power such as United States of America , China ,Russia and western countries but not much academic attention on strategic challenges of emerging technologies in South Asia and their challenges and opportunities for Pakistan specifically in the context of nuclear armed arch rival states. Although many extraordinary research are been done on Strategic implications of emerging technologies but the region of interest is not South Asia specifically India Pakistan. It is focused on strategic implications emerging technologies on strategic stability in South Asia where nuclear weapons create sense of strategic stability, how these emerging technologies challenge existing strategic stability.

Qualitative research

This research study adopts qualitative research design and there are multiple reasons behind to adopt qualitative design.

Research problem and its nature

The aims and goal of the research is to describe and explore the complex situation of strategic implications of emerging technologies, and there effects on strategic stability of South Asia. Emerging technologies effects nuclear deterrence which directly affects Pakistan's national security.

Descriptive study

This study seeks answers how and why questions of research. It describes the sophisticated relationship of India and Pakistan in complex security environment, then the nature of is investigation descriptive rather than statistical and correlational.

Data collection

For this study it was not impossible but difficult to collect primary date, Due to sensitive issues national security, nuclear related data and other calcified military data it was very difficult to get primary data therefor this study relies on secondary data obtain form reliable available sources. And fallowing are categories of sources.

Research journals books or academic publications

Relevant data is obtained from leading reputed domestic and international field research journals. Obtained data form experts in relevant field like as strategic studies, international relation theory, regional security etc.

Research Reports

Data is obtained through research reports for depth understanding and to find the answers of research problem and meet the objectives of this research. Renowned think tanks like as center for strategic studies Islamabad, and other think tank's reports are used as secondary data.

Reports of international organizations

Analytical and reports of international organizations like IMF and World Bank are used to understand and contextualized the economic challenges and opportunities.

Analysis of data

Content analysis technique is use to analysis data and the reason behind is that we analyzed different articles, books, and reports from existing literature.

Theoretical analysis

For the explanation why the themes are established and for further explanation theoretical lens like as structural realism, security dilemma and classical realism are used to explain themes, why these themes are occurring.

Key emerging technologies reshaping strategic landscape of South Asia

South Asia is very much changing its strategic territory with the entry of the emerging technologies that influence the regional security conditions more and more. Some of the most prominent ones are the improvement of artificial intelligence (AI), which is developing autonomous decision-making, intelligence analysis, and precision targeting. The new technologies artificial intelligence, cyber, autonomous, and state-of-the-art conventional weaponry have also made enormous progressions that are bound to change the character of warfare and reshape the security landscape of South Asia (Babar & Abbasi, 2023). Similarly increased dependence on cyber space technologies has widened the offensive and defensive aspects of cyber warfare whereby the states can attack critical infrastructures, communications and even military command-and-control systems. With the introduction of quantum technologies, there will be additional upheaval, especially quantum computing secure quantum communications and sophisticated sensing systems, which may compromise the current encryption systems and change the equilibrium of strategic stability. Air and missile defense systems are being actively developed in the sphere of defense, especially in India, which is increasing the level of concern over the stability of deterrence and makes Pakistan find some cheap countermeasures (Muhammad, 2025).

Secondly, the drone swarm technologies are asymmetrically advantageous because they overwhelm the traditional defenses, whereas stealth fighter jets accord an extra benefit of superiority in the air and deep strike. The introduction of autonomous technologies into nuclear weapons systems, in particular, may be of special interest since it will pose new challenges to the nuclear command-and-control process, posing the threat of unintentional escalation or miscalculation. Lastly, the rapid development of electronic warfare and jamming systems has elevated the capacity of states to interfere with the emission of enemy radars, communication channels, and surveillance systems affecting the modern warfare. Together, these new technologies are transforming the strategic environment of South Asia through the creation of an arms race, changed traditional views of deterrence, and the reduction of decision-making processes, making the region even more volatile and complex.

AI and Automation

Artificial intelligence is a subdivision of computer sciences and is an upcoming field of computer science. The two key drivers of a new wave of technological advancement are automation and artificial intelligence (AI). AI is the smartness that is propelling the automation, which is the machine of efficiency that automatically executes the repetitive and rules-oriented tasks, without human involvement. This is the intelligence that enables computers to learn as a result of data, adapt to new situations and make complex decisions. Artificial intelligence is taking the place of the human in various aspects of life in the social sector to national security. The automated machines are driven by artificial intelligence which is a primary technology. The work of data and cognitive skills and execution and hard work are performed by automated machines, although human input to the daily routine work is replaced by AI. This is because AI and machine learning ML are finding their way into all aspects of life almost anywhere in the globe (Shekhar, 2019).

Automation and Artificial Intelligence: The New Superpowers

Automation and artificial are emerging and most advance technologies we can say super technologies which have potential to transform strategic environment in different regions and world. Once Russian President said "Who lead in AI will lead the world", so I can say both AI and AI based automation technologies are superpowers, both technologies rapidly impacting almost every sector of life, that they are the 21st century's emerging superpowers, radically changing the strategic landscape of the world. Their impact is widespread across all sectors of life, including the military, the economy, and geopolitics. The statement that "whoever leads in AI will dominate the world" encapsulated this revolutionary potential and emphasized the idea that dominance in these technologies equates to global leadership. In contrast to conventional assets, artificial intelligence (AI) multiplies the power of current technologies, enabling everything from revolutionizing warfare to optimizing national economies. This establishes a new axis of global rivalry, sometimes referred to as a "AI arms race," in which algorithmic advantage, data management, and processing speed—rather than merely physical resources—determine domination. The military is where these technologies' immediate effects are most noticeable, as automation and artificial intelligence are changing the fundamental character of conflict. Lethal autonomous weapons systems raise serious ethical concerns and run the possibility of quickly and unintentionally escalating hostilities between adversaries by introducing a paradigm in which judgments involving life and death can be made at machine speed. Additionally, by analyzing enormous volumes of data from satellites and drones, AI-powered intelligence, surveillance, and reconnaissance systems are eliminating the "fog of war" and offering a level of situational awareness that was previously unthinkable. As countries struggle with the security conundrum presented by these sophisticated capabilities, this compression of decision-making time profoundly undermines traditional doctrines of deterrence and necessitates new frameworks for strategic stability (Yarlagadda, 2017).

Applications of AI for civilian and economic purpose In South Asia?

Artificial Intelligence plays a vital role in South Asia in the field of economy and for civilian purposes. South Asian region where world biggest population is living because world first and fourth most populated countries are located in this region and Bangladesh is also very populous country. In the context of India and Pakistan above than 50% of their population is youth. Youth is most important part of any country for their economy. Artificial intelligence is relatively new and emerging technology and you are influenced by these technologies and they are using it in different fields of life for economic purposes like for banking, agriculture, and healthcare etc. For agricultural means it could benefit civilians in regards of agriculture and food security. One of the main and most important steps in food security is identification and detection of diseases. A suite of AI tools harbors the potential to expedite the data analysis for pathogen detection, identification and classification of bacterial isolates, microbial characterization, modeling microbial growth and assessing microbial population dynamics by using diverse set of algorithms an example of the utilization of machine learning in pathogen identification is paper chromogenic array [PCA]. This [PCA] comprises a paper base embedded with 23 chromogenic dyes and their combinations, which react with volatile organic compounds released by target pathogens, causing observable color shifts. These color transformations are digitized and employed to train a multi-layer neural network [NN], providing it with the ability to accurately identify and quantify specific strains of pathogens with high precision (91–95%).

Defense and security application and usages of AI

Technology is developing and emerging with every single moment in the world and every single development has potential challenges, opportunities and risks. Human civilization has been evolved from Stone Age to now smartphone and AI age. Like as atomic technology Artificial Intelligence shake every sector of life in entire world in very small period of time due to fast communication technologies. It is beauty of this technology that it is applied almost every sector of life for infinite purpose. But the difficult and destructive use of this technology is the usage of defense purposes. In south Asian context Artificial intelligence is used for intelligence, reconnaissance, and surveillance. For that purpose AI integrated to satellites, drone cameras, and ground sensors and other devices and equipment. Autonomous lethal weapons systems are AI backed technologies which can be operating least degree of human involvement and result are much more accurate and better. Artificial intelligence could be used for in following manners for surveillance purpose, in LAWS Lethal autonomous weapon systems, unarmed ariel vehicles and in the same way unmanned underwater vehicles for reconnaissance etc. There are significant expectations and challenges, opportunities, and risks associated with LAWS across the full range of military operations. LAWS will influence military operations in the future and will have at least an evolutionary if not revolutionary effect (CERNAT, 2022).

Possible challenges and risks in emerging technologies to Pakistan

New and emerging technologies like Artificial Intelligence (AI) and others are posing challenges and threats to Pakistan's national security and relations with historical rival. The key danger is the risk of nuclear escalation. As in arms race spirals, in the case of acquiring second-strike capability, this is intended to make it impossible to have a failure of deterrence according to the rational deterrence theory (Tehsin et al., 2019). South Asia is experiencing emerging technology's revolution and it has implications for regional stability. We are in a fourth industrial revolution (4IR) in which a wave of new and transformative technologies is emerging, such as artificial intelligence (AI), Additive Manufacturing (AM), Quantum Information Technology (QIT), hypersonic missiles, biotechnology and directed energy. These technologies have potential to have broad impacts on societies and economies, but most are dual use and will also have impacts on national security, such as nuclear strategic stability (Kroenig, 2021). The use of cyber attacks and integration of cyber technologies with traditional technologies and hypersonic missile systems can jeopardize nuclear security. Increasingly, there has been concern about emerging technology deteriorating nuclear strategic stability because of its impact on nuclear second-strike capabilities or its impact on dual-use systems, such as nuclear command, control, and communications. Cyber-attacks and conventional hypersonic missiles could be used together to offer the adversary the threat of 'first strike' against its nuclear forces; advanced 'directed energy' missile defenses could be used to 'take out' enemy nuclear retaliation. These new technologies could disrupt nuclear strategic stability by threatening an enemy's second strike arsenal, which is already hardened and protected from other countries (Kroenig, 2021).

The growth of south Asian cyber infrastructure

Cyber infrastructure development is increasing quickly in south Asia particularly India & Pakistan. The cyber infrastructure has been expanding and data center, 5G networks, optical fiber, etc. are being established. This technological infrastructure will have a transformative impact on South Asia. This digitalisation will improve the tech interface in finance, commerce, defense, health care, agriculture, fine-tech, national security and more. Cyber-infrastructure involves computing systems, data storage

systems, advanced instruments and data repositories, visualization environments, and people, interconnected by software and high performance networks that enhance research productivity and facilitate research breakthroughs that would otherwise not be possible (Stewart et al., 2010).

Cyber threat to the national security of Pakistan

High pace integration of emerging technologies especially cyber technologies into south Asian countries' national security paradigm create challenges and as well as opportunities. National security challenges are created by non-state actors and state-sponsored actors who are cyber committing on critical, sensitive and strategic infrastructure of Pakistan. In simple words cyber is the combinations of two terms one is electronic media internet communication means the combination which is based on electronic devices and internet. To protect country from such attacks Pakistan invests on cyber defense capabilities to insure national security and convert challenge into opportunity. The term "cyber- attack" refers to a cyber-operation to "alter, disrupt, mislead, degrade, or destroy computer systems or networks or the information and/or programmers resident in or transiting these systems or networks." (M. I. A. Khan, 2019).

Space technologies the Last Frontier: Space Contestation & Militarization

Global and regional powers are intentionally, rapidly militarized the space. Initially space was used for just research purposes and communication, navigation and surveillance but now it is militarized and world powers make it scientific front for critical arena for geopolitical competitions especially USA, Russia, China and India. When technological growth was characterized by military space contestation and civil space cooperation The major outcome of this era was the consolidation of military technologies in space by major space powers of the time.¹³ On the one hand, the Americans, now the dominant power, and the Russians now a relegated one, both contested for greater military influence in space by launching a plethora of legacy space systems as spy satellites in Low-Earth and Medium-Earth orbit and scavenging vacant slots in Geosynchronous orbits for expanding their military influence. This has marked the beginning of a new space contest, the race for global dominance through the establishment of space supremacy by the great powers of contemporary times (Sarosh, 2024).

Space programmers of India and Pakistan

In 1961, world renowned scientist Dr. Abdus Salam founded Pakistan space program (SUPARCO) with the help of the government of Pakistan. At first, its advancement was inevitable and in 1962, Pakistan launched its first rocket named Rehmat rocket and became the third country in Asia and tenth in the world to achieve such great success in space technology. At that time Pakistan's space program or SUPARCO was formed and USA supported Pakistan in space research and development for peaceful.

For the space program, 1961-1972 was a period of significant collaboration with the United States, with a particular focus on purposes. In 1961, SUPARCO was formed as a committee to work on the space program of Pakistan, and Dr. Abdus Salam was appointed as the chairman []. The prime role of SUPARCO is to research in the field of space science and space technology and to develop peaceful application of space technology for the benefit of the nation. It is dedicated in the field of applications for space exploration (Mehdi & Su, 2019). Dr. Vikram Sarabahi (1960) has developed the Indian space program.

Missiles and Hypersonic Technologies: Quick Response

Invention of hypersonic missile alters the notion of conventional war and renders it 'warfare' whose speed and precision have shortened the response time. There aren't any conventional ballistic and cruise missiles with such speed and precision. The hypersonic missile speed is five times of sound speed and has a high maneuverability. These missiles are not detecting by air-defense systems. A nuclear war between India and Pakistan, each with its own missile delivery system, has changed the strategic narrative in South Asian security landscape. Another abnormal threat is hypersonic weapons, which also may be destabilizing, particularly among the nuclear-armed nations. Due to their maneuverability and high speed, hypersonic weapons can evade adversary's ballistic missile defense systems. In the case of precision strikes against the opponent's offensive forces, however, these weapons can be used to provide an advantage right from the outset of the war (Sultan & Khursheed, 2021).

South Asian military development in the field of nuclear and missile technology in South Asia.

Avert nuclearization of South Asia and give a sense of strategic stability the power gape between India and Pakistan really large in conventional terms of power. It's the first day of the second animosity between two nations India and Pakistan for

the following reasons: Historical baggage, identity conflict, religious difference and state interests, ambitions and objectives. Both countries were thrust into rivalry by these factors. In 1947, India illegally invades Kashmir, in 1965, India launches a war against Pakistan and in 1971, India splits Pakistan. India illegally occupies Kashmir in 1947, inflicts a war on Pakistan in 1965 and splits Pakistan in 1971, and this instills fear in Pakistan. To overcome this fear and existential threat Pakistan acquired nuclear weapons in 1998; Pakistan's nuclear weapons ensure its survival and establish strategic stability and deterrence. Once it has acquired the nuclear weapons it needs, both states need to acquire delivery systems or missiles. For credible nuclear deterrence delivery systems are key. The possession of nuclear weapons alone is not very useful if they are not made ready for delivery (Khatoon, 2023). India and Pakistan have been nuclear powers for just over 25 years. Both are still trying to increase their missile range, accuracy, navigation and the strength of their launch platforms, as well as their command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities (Akhtar & Sethi, 2024).

Military Modernization of India and Pakistan

South Asia nuclear states India and Pakistan both are doing their best to modernize their militaries in their capacities. India has more military strength as compared to Pakistan, therefore, India is investing a huge amount of money to modernize its military. The Indian modernization upset Pakistan due to lack of resource to balance it quantitatively, but Pakistan concentrated on qualitative modernization to overcome fear of Indian modernization Pakistan invest in its nuclear weapons to balance it and ensure deterrence. In recent years, headline grabbing increases in the Indian defense budget have raised concerns that India's on-going military modernization threatens to upset the delicate conventional military balance vis-à-vis Pakistan. This is seen as an excuse for Islamabad to develop tactical nuclear weapons and other measures that have negative strategic consequences for the subcontinent (Ladwig III, 2015). The Indian Government is India's largest consumer of conventional weapons with estimated expenditure of \$100 billion on modernizing the defense forces within the next decade. With these developments, many analysts and researchers have come up with the idea that Indian military modernization poses a threat to Pakistan's conventional deterrence. In turn, this is pressuring them to embrace new nuclear weapons, particularly low-yield warheads and delivery systems for use on the battlefield, so-called tactical nuclear weapons (Ladwig III, 2015).

Quantum Technologies and National security

The development of Quantum technology and its applications in systems for protection have a paradigm shift, with great implications for secure communication for the purposes of intelligence. It could decimate the encryption protocols that are so easy to crack and compromise state secrets, military commands, financial command and most importantly nuclear and strategic command and control system. Quantum technology is an emerging and disruptive technology that could impact many aspects of human life. Quantum technologies are dual use technologies and are therefore of interest to the defense and security industry, military and governmental actors (Krelina, 2021).

Unmanned Systems and Robotics (Drones, UAVs, and UGVs):

Autonomous weapons, unmanned vehicles, unmanned ground vehicles (UGVs), robots and any machines which run on machine learning or AI based technologies are considered to be autonomous weapons. Rapidly advancement of autonomous weapons in the field of defense and military alter the existing conventional strategic and national security concepts. Strategic stability of South Asia is affected by the quest for advanced technologies by powerful countries, especially between the US and China. In particular, the strategic partnership between the US and India to counter China has raised security threats for Pakistan. In the current context, India's quest for new technologies may well aggravate the deteriorating strategic situation in South Asia. India's technological advancement and the required shift in its doctrines to match the changing political landscape in the region also threaten the security of South Asian deterrence. The challenge to deterrence stability in the region comes from the technological development of India and the required doctrinal changes to accommodate the changing political systems in the region (Babar & Abbasi, 2024).

Key Findings

Following are the key findings of investigation.

1. Emerging technologies reshaping strategic environment of South Asia
2. Existing nuclear deterrence is minimizing due to integration of ETs

3. AI, LAWS playing crucial role in Indian military doctrine, which pose challenges to Pakistan's National security.
4. ETs enhance the second strike capability
5. Indian easy access to ETs and its size of economy puts pressure on Pakistan to invest in ETs which start a technological race.
6. It is difficult for Pakistan to compete Indian rapidly advancement because of Indian size of economy and resources

Results

- **Strategic landscape of south Asia is transforming by emerging technologies**

In the context of strategic environment of South Asia emerging technologies especially AI, LAWS, Cyber capabilities, hypersonic missiles and space technologies are altering concept of warfare and deterrence.

- **Islamabad is challenged by Indian integration of emerging technologies into its defense sector**

Technologies such a quantum computing , AI autonomous weapon systems, air defense which is purchased from Russia (S-400) increase Indian defensive and offensive capabilities which undermine Pakistan's nuclear deterrence and strategic stability.

- **Indian economic resources and strategic advantages**

Indian economy and resource as well as its easy access to technological market such as United States of America, Russia, Israel and other developed countries provide him strategic advantage over Pakistan.

- **There are strategic constraints for Pakistan**

Due to unstable economy and political atmosphere, poor governance, educational issues, infrastructural issues Pakistan face challenges.

- **Pakistan has opportunities with challenges too**

Pakistan has deep ties with China and it can acquire emerging technologies and develop indigenously through technology transfer and enhance the skills and capabilities of its people.

Challenges to Pakistan's Strategic and Security Landscape

Pakistan's security and strategic landscape is facing by multiple complexes internal and external factors, internal factors are political instability, economic fragility internal security, governance, and many other undeniable factors. On external front Pakistan has unhealthy relations with both two countries Afghanistan and Iran (Relations with Iran are gradually comparatively improving). Third and most important front is India which is arch rival of Pakistan and involved three wars and disintegrates Pakistan into two parts in 1971. In the atmosphere of rivalry under the shadow of nuclear arms and external players strategic objectives and ambitions pose strategic and security challenges for Pakistan (Shah, 2025).

Economic and Infrastructure Constraints

The traditional conceptualization of national security was military and defense based but that traditional thinking will soon go through transformation. It is supposed that economy is one of the largest threats to national security. The fact that weak economies cannot guarantee their survival in international system, national security comprises economic security. Pakistan has economic, infrastructural limitations. Economic security is a critical element of the welfare of any nation which has many facets including sustainable growth, stable employment and balanced distribution of wealth. As a developing nation, with a dynamic socio-economic environment, Pakistan has complex issues of providing economic security to its citizens (Sheikh et al., 2022).

Most of the strategic vulnerabilities in Pakistan are rooted in economic fragility. Modern literature associates sustainable national security with the financial soundness and sustainability of state institutions: extended fiscal deficit, high external debt service, and low national revenue mobilization narrows over time investments in defense modernization, social goods and technology and thus limits policy autonomy and strategies available. The recurrent balance-of-payments crises in Pakistan and the need to secure conditional external funding have, in essence, necessitated the pursuit of short-term stabilization interests at the expense of long-term developmental and strategic interests. These macroeconomic pressures are seen in limited procurement of defense equipment, slow research and development of security related technologies and limited ability to finance logistics and disaster resilience programs- all of which weaken strategic posture over time (Davies, 2011).

Policy and Governance Obstacles

A robust, powerful, dynamic and successful country requires good governance. Weak states are unable to guarantee their survival in the international systems weak governance put barriers both internally as well as externally politically, economically, and strategically. One of the critical pillars of maintaining democracy, human rights and economic development is the rule of law, but Pakistan has experienced a deep crisis in this sector that is a major menace to the national security (Imran & Kazmi, 2025). The repetitive limitations forming the direct influence on the strategic capacity of Pakistan are weak governance, inconsistency of policies, and fragility of the institutions. The ineffective financial and management practices such as locating financial resources like poor levels of public financial resources, lack of efficiency in expenditure allocation, corruption and poor procurement systems limit fiscal space in strategic investments, and distort expenditures towards long term capability building as opposed to short-term stabilization. The institutional reviews of multilateral and national frameworks continuously single out the limited mobilization of national revenues and disproportionate spending results on the populace as the causes of recurrent fiscal catastrophes and limited investment prospects (World Bank, 2025a).

Regional Rivalries and Geopolitical Pressures

The unstable politics, economic and military relations between Pakistan and Afghanistan and rivalry between the countries of Pakistan and India form the unstable geopolitical environment around Islamabad. It is a common saying that, Enemy enemy is friend and enemy is friend enemy now the scenario in south Asian region is no different

Since India is ensuring power in Afghanistan and it is playing its wicked game against state of Pakistan. This puts Pakistan under geopolitical pressure. Strategic complexity South Asia as a locality is caught between powerful state competition-notably between China and the United States confounds its neighbors, however, Pakistani growing relations with China (strategic, economic and military) offers critical investment and diplomatic support, although it also subjects Pakistan to internationalization (Belt and Road Initiative) which is subject to external criticism and can arouse regional protest. U.S. strategic posture towards India (defense cooperation, intelligence sharing and technological relationships) on the other hand, changes balances in the region and forces Pakistan to review its own balances. Researchers emphasize that the influence of these great powers limits the strategic autonomy of Pakistan because a country has to balance this and maintain national interests (Li et al., 2021). In 1962, Indian and China are also engaged in war in the South Asian region and border skirmishes over the years.

Conclusion

This study examines the strategic considerations of new technologies in South Asia and its problems and opportunities to Pakistan. Access of international technological market and alliance with United States of America Russia and other western first world countries will be easily accessible and available to India and make sure that it modernizes its military with advance and emerging technologies. The combination of the destructive technologies, AI, autonomous weapons, UAVs, antisatellite weapons systems, the systems of hypersonic shooting, high speed and fifth generation stealth fighter jets, air defense systems placed the area in the state of turmoil. Stability issues are already being experienced in South Asia because of India hegemonic aspirations and massive asymmetric gap between the traditional competitors India and Pakistan. The current nuclear setback developed by the Pakistani nuclear power whose main purpose is to provide credible minimum deterrence is under threat because of the fast development of Indian modernization of its military strength through the integration of modern technologies in nearly all the military fields. Pakistan can also enjoy opportunities in this unstable strategic and security environment in South Asia through emerging technologies. Pakistan can gain the new technologies by having all weather relationship with the emerging technological/ economic powerhouse China and also training its young people to develop its own technologies.

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