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Volume II

No.1

Winter 2024

1. India's Evolving Space Militarization and the Security Implications for Pakistan-----01
Abu Hurairah Abbasi and Saheer Liaqat
2. Assessment of India's Nuclear Security Architecture-----32
Anum A. Khan
3. National Security Implications of Africa's Demographic Timebomb in the Twenty-First Century -----58
Mercedes F. Scheible
4. Role of Directed Energy Weapons (DEWs) in Shaping the Future of Warfare in South Asia-----79
Ifa Khurshid
5. Abrogation of Article 370 and 35-A: Policy Options for Pakistan---105
Asad Ullah Khan

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**INDIA'S EVOLVING SPACE MILITARIZATION AND
THE SECURITY IMPLICATIONS FOR PAKISTAN**

Abu Hurrairah Abbasi and Saheer Liaqat

India's Evolving Space Militarization and the Security Implications for Pakistan

Abu Hurrairah Abbasi and Saher Liaqat *

Abstract

India's evolving militarization of space, marked by its growing military space capabilities and strategic investments, presents security challenges for Pakistan. As India's space power expands, including its development of anti-satellite weapons and defense-oriented space programs, the regional security dynamics shift, raising concerns over an arms race and strategic instability in South Asia. This paper employs the Security Dilemma Theory to analyze the impact of India's space advancements on South Asian regional stability. Using the qualitative research methodology, the research identifies India's development of anti-satellite weapons, defense-focused space programs, and global positioning as a major space power escalates the risk of an arms race, heightens strategic instability, and intensifies Pakistan's vulnerabilities. It also underlines the lack of crisis communication channels and robust confidence-building measures (CBMs) between the two countries, further amplifying the threat of inadvertent escalations. The findings suggest that Pakistan must adopt a proactive strategy to address these regional challenges. Collaborative efforts among regional stakeholders, participation in multilateral space forums, and adherence to international space law principles are essential for regional space security and stability in South Asia. This study underscores the importance of balancing national

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security interests with regional and global stability in the increasingly contested space domain.

Keywords: India, Pakistan, Space Militarization, Security, South Asia

Introduction

States around the world are expanding their reach beyond the boundaries of space. They are adopting various pathways to reach outer space. In previous decade, the trend of space exploration witnessed an acceleration. The recent state efforts are not limited to scientific exploration, but they have importance in the domain of national security.

India has been making efforts in the domain of space for decades. It established Indian Space Research Organization (ISRO) in 1969. ISRO has been launching satellites for multiple purposes such as communication, weather prediction, remote sensing and scientific research.¹ ISRO's work is steadily expanding, and it is not just limited to launching satellites. It has successfully landed a rover on the south pole of the moon and also launched a mission to Mars in 2013.²

Space militarization can be defined as the utilization of space and space-associated technologies for purpose of military objectives. The militarization of space is going to have a significant impact on regional and global stability. Although India claims that its space program is for civilian purposes, the dual-use nature of space assets has implications for strategic stability. Moreover, India is also shifting its space capabilities from civilian use to military use. The development of satellite-based navigation systems like Navigation with Indian Constellation (NavIC) and reconnaissance satellites for surveillance are clear examples of this shift. India is also tested anti-

¹ Dinshaw Misty, "India's Emerging Space Program," *Pacific Affairs* 71, no. 2 (1998): 151–74, <https://doi.org/10.2307/2760974>.

² "Mangalyaan, India's First Mars Mission," *The Planetary Society*, accessed July 13, 2024, <https://www.planetary.org/space-missions/mangalyaan>.

satellite missile in 2019, which signifies shift from defensive to offensive space capabilities.³

The militarization of space introduces new complexities in diplomatic relations and arms control efforts. The lack of comprehensive international agreements regulating military activities in space exacerbates tensions and necessitates diplomatic engagements to mitigate risks of conflict escalation. Against this backdrop, India's militarization of space presents multifaceted security challenges for Pakistan, a neighboring South Asian country with a complex history of regional dynamics and security concerns. These challenges encompass strategic, technological, diplomatic, and deterrence-related aspects, shaping the security calculus of both nations and the broader regional security landscape. The dynamics of deterrence between India and Pakistan are evolving with advancements in space capabilities. Integrating space assets into military doctrines and strategies complicates deterrence calculations, influencing crisis stability and escalation dynamics.⁴

India's expanding space capabilities, including satellite-based surveillance and reconnaissance, directly affect Pakistan's national security. Efforts to develop indigenous space technologies, such as satellite launch vehicles and space-based communication systems, highlight its impact on defense capabilities. Pakistan faces serious challenges in mitigating such vulnerabilities, assessing its defense capabilities, and addressing the broader implications of India's space militarization within the regional security complex in South Asia. The enhanced monitoring and intelligence-gathering

³ Balak Singh Verma, "Introducing NavIC 2.0: Leveraging India's Strategic Space Advantage," *Observer Research Foundation*, April 1, 2024, <https://www.orfonline.org/expert-speak/introducing-navic-2-0-leveraging-india-s-strategic-space-advantage>.

⁴ Mian Zahid Hussain and Raja Qaiser Ahmed, "Space Programs of India and Pakistan: Military and Strategic Installations in Outer Space and Precarious Regional Strategic Stability," *Space Policy* 47 (February 1, 2019): 63–75, <https://doi.org/10.1016/j.spacepol.2018.06.003>.

capabilities enabled by Indian satellites, therefore, raise concerns about strategic vulnerabilities and potential preemption scenarios for Pakistan. The existing literature has investigated the strategic implications of space militarization, focusing primarily on arms control, deterrence stability, and geopolitical rivalry.

Literature Review

The militarization of space has gained increasing attention and it is changing strategic balance within South Asia. Existing literature has highlighted India's emergence in the space technologies as a growing threat to regional stability. Many scholars have identified critical gaps in deterrence framework.

Ahmed Saeed Minhas, in his article "*Space Weapons: A Rapidly Evolving Threat to South Asian Strategic Balance*," explores the inevitability of space weaponization, focusing on India's space program and its implications for South Asia's deterrence stability. He argues that India's probable development of space weapons could undermine Pakistan's deterrence stability, intensifying the regional arms race.⁵ Muhammad Tehsin, in his article, "*Space Weaponization and Strategic Stability in South Asia*," expands on these concerns by examining the interplay between space militarization and mutual deterrence strategies in South Asia.⁶

Ahmad Saeed Minhas and Ghulam Qumber, in their research paper, "*Emerging Space Weapons Probability and Indian Quest for Great Power Status: Implications for South Asian Deterrence Stability*," contextualize India's space pursuits within its aspiration for great power status, analyzing how the nationalist government leverages its space capabilities to assert

⁵ Ahmed Saeed Minhas, "Space Weapons: A Rapidly Evolving Threat to South Asian Strategic Balance," *Ndu Journal*, 2018, <https://ndujournal.ndu.edu.pk/site/article/view/174/129>.

⁶ Muhammad Tehsin, "Space Weaponization and Strategic Stability in South Asia," *Global Social Sciences Review*, V (1): 689-695, <https://www.gssrjournal.com/article/space-weaponization-and-strategic-stability-in-south-asia>.

dominance.⁷ Munazza Khalid, in her research article “*India-US space cooperation: Implications for the South Asian strategic stability*,” focuses on the India-US space partnership, emphasizing its implications for South Asia’s strategic stability. She highlights the asymmetric impact of this partnership on regional dynamics, with Pakistan increasingly reliant on China for strategic parity.⁸

The reviewed literature underlines the destabilizing effects of India’s space militarization on South Asia’s strategic stability but leaves significant gaps in understanding Pakistan’s countermeasures and the broader implications for crisis management. This study seeks to bridge these gaps by analyzing Pakistan’s strategic responses, exploring collaborative opportunities with China, and examining the role of international regulatory frameworks. By addressing these gaps, the research contributes to a deeper understanding of space militarization’s impact on South Asia and offers policy recommendations to mitigate escalating tensions.

However, research gaps exist related to India’s expanding space militarization and its implications for Pakistan’s national security interests, specifically within the broader Indo-Pakistan security landscape. This gap in the literature underscores the need to investigate the implications of India’s evolving space capabilities on crisis stability, regional deterrence dynamics, and Pakistan’s strategic vulnerabilities.

Against this backdrop, this research addresses the following research questions: How does India’s space militarization impact Pakistan’s National Security? What are the implications of India’s evolving space militarization

⁷ Ahmed Saeed Minhas and Ghulam Qumber, “Emerging Space Weapons Probability and Indian Quest for Great Power Status: Implications for South Asian Deterrence Stability,” *Margalla Papers* 22 (2018), <https://ndujournal.ndu.edu.pk/site/article/view/174/129>.

⁸ Munazza Khalid, “India-US Space Cooperation: Implications for the South Asian Strategic Stability,” *Journal of Humanities, Social and Management Sciences (JHSMS)* 2, no. 2 (2021): 55–66, <https://ideapublishers.org/index.php/jhsms/article/view/475/226>.

for deterrence stability and crisis escalation in South Asia? These questions are important for developing a nuanced understanding of the security challenges posed by India's space program to Pakistan. Therefore, developing a rational link between India's space militarization and its security implications for Pakistan necessitates investigating historical trajectories, strategic developments, and emerging technologies while situating these within the broader regional security and space governance debates.

Theoretical Framework

The security dilemma theory helps us understand the intensifying tensions between India and Pakistan regarding India's space militarization.⁹ The fundamental concept of the security dilemma is that the security measures one state takes to bolster its security, such as military enhancements or technology innovations, may invoke insecurity in the adversary states.¹⁰ This perceived threat compels the rival state to take defensive steps, resulting in an arms race and heightened instability, even when no state aimed for this result.

India's advancement of anti-satellite weapon systems is motivated by its intent to enhance security.¹¹ Pakistan perceives India's actions as aggressive, interpreting them as efforts to establish supremacy and secure a regional strategic advantage. Consequently, India's urge to militarize space makes Pakistan more vulnerable, prompting its own defensive actions. This interaction illustrates the security dilemma, where one state attempts to enhance its security unintentionally exacerbate the security apprehensions of another state.

⁹ Shiping Tang, "The Security Dilemma: A Conceptual Analysis," *A Theory of Security Strategy for Our Time*, by Shiping Tang (New York: Palgrave Macmillan US, 2010), 33–71, https://doi.org/10.1057/9780230106048_3.

¹⁰ Ibid.

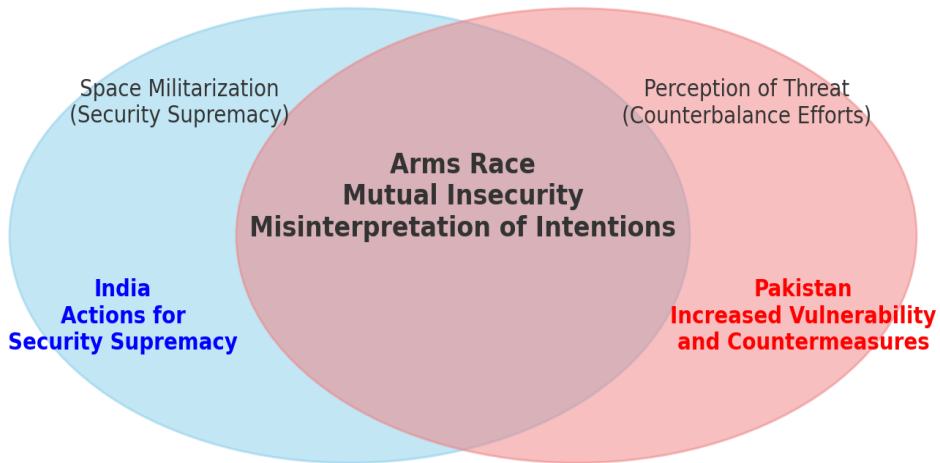
¹¹ Dimitrios Strokos, "Still Lost in Space? Understanding China and India's Anti-Satellite Tests through an Eclectic Approach," *Astropolitics* 21, no. 2–3 (September 2, 2023): 179–205, <https://doi.org/10.1080/14777622.2023.2277253>.

A fundamental aspect of the security dilemma is the misperception of intentions. Pakistan views these advancements as an endeavor by India to alter the power balance in its favor, hence jeopardizing Pakistan's security. Consequently, Pakistan may feel obligated to enhance its space and military capabilities to offset India's perceived superiority. This cycle of action and reaction engenders an increasing arms race despite both countries operating from defensive motivations.

The security dilemma starts from conventional military rivalry but also encompasses emerging domains, like space as well.¹² India's militarization of space creates a novel domain of geopolitical rivalry between the two nations, complicating an already tense security landscape. As both states try to strengthen their positions on this new frontier, their competition moves from traditional military settings to space, making the region even less stable.

External forces also affect this concept. Pakistan is more concerned about India's relationships, especially with the US. Pakistan sees India's militarization of space as part of a larger strategic shift that threatens its security and throws off the balance of power in the region. The involvement of external forces enhances the security dilemma and makes it harder for India and Pakistan to lower their tensions. Thus, India's efforts to enhance its space militarization create a cycle of increased fear and tension with Pakistan. This shows how bad the security dilemma is and how important it is to discuss it and build trust to stop further destabilization.

¹² Jeremy Grunert, "Outer Space Policy and the 'Security Dilemma': Is America Destined for Space Conflict?" *The United States Space Force and the Future of American Space Policy* (Brill Nijhoff, 2022), 165–240, <https://brill.com/downloadpdf/book/9789004524064/BP000005.pdf>.



Made by the Authors

Historical Context of Space Militarization by India

India's space exploration and technological advancement are marked by a series of milestones and strategic decisions that have shaped its current standing as a significant space-faring nation. The roots of India's space program can be traced back to the 1960s when Dr. Vikram Sarabhai laid the foundation for space research and development.¹³ In 1962, the establishment of the Indian National Committee for Space Research (INCOSPAR) paved the way for the formation of the ISRO in 1969.¹⁴

During its early years, ISRO focused on developing indigenous satellite technology, starting with the Aryabhata satellite launched in 1975. Subsequent missions, such as Rohini and Apple satellites, showcased India's capabilities in space technology and laid the groundwork for more advanced endeavors. One of the significant contributions of Indian space program has

¹³ Biswanath Gupta and Kd Raju, "Space Exploration by India and Socio-Economic Cooperation with SAARC Countries," *India Quarterly* 72, no. 3 (2016): 278–89, <https://www.jstor.org/stable/48505507>.

¹⁴ "Indian Space Research Organisation," accessed July 15, 2024, <https://www.isro.gov.in/genesis.html>.

been in space applications, particularly in communication and remote sensing.¹⁵ The launch of the Indian National Satellite System (INSAT) in the 1980s revolutionized telecommunications, broadcasting, and meteorology, benefiting various sectors of the economy and society.¹⁶

Indian space program also expanded its horizons through international collaborations and achievements. Collaborative ventures such as the Indo-French Megha-Tropiques satellite and participation in global space forums provided significant support to the Indian space program.¹⁷

The convergence of space technology with defense requirements led to integrating space assets into India's national security framework. Indian space doctrine has evolved to encompass both civilian and military aspects, reflecting a dual-use approach to space technology. Articulating space policy frameworks and guidelines for space activities and establishing dedicated military space units highlight India's strategic focus on leveraging space for national security interests. The strategic imperatives driving India's foray into military space capabilities are multifaceted. Key factors include the need for enhanced surveillance, intelligence gathering, communication resilience, and navigation precision in support of defense and security objectives. Security concerns arising from regional threats and geopolitical dynamics have also influenced the Indian space strategy.¹⁸

¹⁵ Ibid.

¹⁶ Ashok Raj and C. Vishnu Mohan, "INSAT: Evolution and Prospects," *Economic and Political Weekly* 17, no. 33 (1982): 1326–31, <https://www.jstor.org/stable/4371240>.

¹⁷ Thierry L. Trémas et al., "ScaRaB: First Results of the Scanner for Radiative Budget on Board the Indo-French Satellite Megha-Tropiques," in *Earth Observing Systems XVII*, vol. 8510 (SPIE, 2012), 13–27, <https://www.spiedigitallibrary.org/conference-proceedings-of-spie/8510/851002/ScaRaB--first-results-of-the-scanner-for-radiative-budget/10.1117/12.928293.short>.

¹⁸ Rajeswari Pillai Rajagopalan and Dimitrios Stroikos, "The Transformation of India's Space Policy: From Space for Development to the Pursuit of Security and Prestige," *Space Policy*, May 14, 2024, 101633, <https://doi.org/10.1016/j.spacepol.2024.101633>.

Developing advanced space technologies, including satellite imaging, remote sensing, and satellite-based navigation systems like NavIC, positioned India as a significant player in space. The demonstration of ASAT capabilities during Mission Shakti in 2019 marked a destabilizing move, highlighting India's ability to target and potentially disrupt critical space assets.¹⁹

India's progression in space militarization has not occurred in isolation but has reverberated across the regional and global security landscape, influencing strategic perceptions, alliances, and arms dynamics. In the context of South Asia, India's space militarization has added a new dimension to the regional security paradigm. It has prompted neighboring countries like Pakistan to reassess their security postures, develop countermeasures, and engage in strategic balancing to address perceived threats from space-based capabilities.²⁰

Indian Military Space Capabilities

Indian military space capabilities have significantly impacted its defense posture and strategic capabilities. The multifaceted nature of these capabilities, ranging from satellites and launch vehicles to strategic doctrines and partnerships, underscores their importance in national security planning, regional dynamics, and global space governance frameworks. Understanding the nuances of India's military space capabilities is crucial for assessing their impact on security paradigms, fostering cooperation, and managing potential risks in the increasingly contested domain of space.

¹⁹ "Mission Shakti: Turning Point in India's Space Defence Technology," *Employment News*, April 20, 2024, <https://www.employmentnews.gov.in/newemp/MoreContentNew.aspx?n=SpecialContent&k=110627>.

²⁰ "Speakers Renew Calls for Treaty to Prevent Arms Race in Space as First, Fourth Committees Convene Joint Meeting | Meetings Coverage and Press Releases," *United Nations*, October 27, 2022, <https://press.un.org/en/2022/gaspd761.doc.htm>.

NASA-ISRO Synthetic Aperture Radar (NISAR)

In partnership with NASA, ISRO plans to deploy the SAR satellite utilizing the GSLV-Mk II by 2025.²¹ This initiative continues India's radar imaging program, which commenced with the launch of RISAT-2 in April 2009.²² The RISAT-2 program, which resembles Israel's TecSAR satellite, was conceived to meet India's border security needs.

▪ **GSAT-6**

With a mass of 2117 kilograms, GSAT-6 represents the second satellite specifically designed to meet the requirements of the Indian military, facilitating communication for personnel through satellite terminals instead of conventional portable V/UHF radios, thereby enhancing operational capabilities across diverse terrains such as maritime zones, coastal areas, forests, deserts, rivers, and snow-laden mountains.²³ The satellite provides command centers with immediate communication and enhanced situational awareness. GSAT-6 represents the 25th geostationary communication satellite developed by ISRO and is the sixth installment in the GSAT series. The satellite facilitates S-band communications via five spot beams, employing a 6-meter-wide antenna, encompassing India for user links, and C-band communication through a singular beam.

²¹ "A.27 NASA-ISRO Synthetic Aperture Radar Mission (NISAR) Research and Applications Science Team: Not Solicited in ROSES-2024," *NASA Solicitation and Proposal Integrated Review and Evaluation System*, February 14, 2024, <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7b26099298-ACCA-00C5-3B87-3C358CD396C6%7d&path=&method=init>.

²² "RISAT-2 (Radar Imaging Satellite-2)," *eoPortal*, August 9, 2023, <https://www.eoportal.org/satellite-missions/risat-2#eop-quick-facts-section>.

²³ Rajeswari Pillai Rajagopalan, "What Does India's Satellite Trouble Mean for Its Space Ambitions?," *The Diplomat*, April 4, 2018, <https://thediplomat.com/2018/04/what-does-indias-satellite-trouble-mean-for-its-space-ambitions/>.

▪ ***GSAT-7A***

Initiated on December 19, 2018, GSAT-7A represents the 35th communication satellite engineered by ISRO. The objective is to equip the Indian Air Force (IAF) with advanced Ku-band communication capabilities. The satellite, featuring a chemical propulsion system, is designed to operate for at least eight years.²⁴ GSAT-7A was designed to unify ground radar stations, UAVs, airbases, and AWACS systems within the IAF, enhancing its network-centric warfare capabilities and promoting intelligence-sharing across various platforms. Referred to as the 'Indian Angry Bird,' GSAT-7A, GSAT-7, and GSAT-6 constitute an essential communication network for the military forces of India.

▪ ***Rukmani Satellite***

In a noteworthy advancement in 2013, the Indian Navy distinguished itself as the inaugural branch of the nation's defense forces to utilize a specialized communication satellite known as the Rukmani Satellite. This launch revolutionized the communication methods employed by naval vessels, aircraft, and terrestrial forces over extensive distances. Implementing secure, encrypted real-time satellite communication has significantly enhanced intelligence-sharing capacity, bolstered tactical awareness, and facilitated superior command and control across extensive operational domains. The Rukmani, or GSAT-7 (also referred to as INSAT 4F), is a military communications satellite with a mass of 2650 kilograms. The total expenditure amounted to roughly Rs 180 crore, while the costs associated with launch services from international suppliers reached approximately Rs 480 crore. The satellite significantly enhanced communication and surveillance across both the eastern and western sectors of the Indian Ocean, covering approximately

²⁴ "GSAT-7A: A Military Communications Satellite Developed by ISRO for IAF," *Airforce Technology* (blog), January 9, 2019, <https://www.airforce-technology.com/projects/gsat-7a/>.

2000 nautical miles. The implementation of this system allowed the Indian Navy to transcend reliance on conventional V/UHF/HF communication methods, which were vulnerable to jamming, hacking, and interference, as well as constrained by range limitations. Historically, naval vessels depended on Commercial INMARSAT terminals, commonly utilized by merchant ships, which were both costly and offered diminished security. These systems presented considerable dangers throughout the conflict by endangering communications and naval positioning. INMARSAT, under the management of British Satellite Telecommunications Ltd, offers mobile satellite communications services worldwide.²⁵

▪ ***RISAT Satellite***

In May 2019, India initiated the deployment of the RISAT-2B, an Earth observation satellite designed to augment reconnaissance capabilities. This satellite was launched after the RISAT-2, which played a vital role in the surveillance. RISAT-2B is equipped with an X-band synthetic aperture radar, enabling it to capture high-resolution images continuously, regardless of the time of day or prevailing weather conditions.²⁶ The satellite, equipped with sensors from Israel Aerospace Industries, is engineered for a mission duration of five years. ISRO intends to deploy four more satellites of this type, with the imagery obtained from the RISAT-2B proving crucial during India's surgical strikes in 2016 and the Balakot airstrike in February 2019.

²⁵ "What Is GSAT-7 Rukmini?," *The Indian Express* (blog), July 5, 2017, <https://indianexpress.com/article/what-is/india-rukmini-gsat-7-satellite-china-indian-ocean-region-sikkim-standoff-4736318/>.

²⁶ Hanneke Weitering, "India Successfully Launches RISAT-2B Earth-Observation Satellite," *Space.com*, May 22, 2019, <https://www.space.com/india-risat-2b-earth-satellite-launch-success.html>.

▪ ***Integrated Space Cell***

The Department of Space, ISRO, and the three branches of the military forces came together to develop the Integrated Space Cell in response to mounting threats to India's space-based infrastructure. This organization combines military and space missions to protect India's space resources.²⁷ After China successfully demonstrated an anti-satellite missile in 2010, which destroyed one of its outdated weather satellites, the necessity for such an agency became even more apparent.

▪ ***CARTOSAT Satellites***

The recent CARTOSAT-3 satellite signifies a notable progression in satellite imaging technology, boasting a resolution of up to 20 centimeters, facilitating intricate imaging of military assets, including bunkers and weapon systems.²⁸ Earlier models, such as CARTOSAT-2, 2A, and 2B, offered a resolution reaching 0.5 meters. The satellites are outfitted with panchromatic (PAN) cameras, capable of capturing high-resolution stereoscopic black-and-white images of the Earth's surface within the visible spectrum, fulfilling purposes for both military and civilian sectors.

▪ ***EMISAT***

ISRO successfully launched the electronic intelligence satellite EMISAT in April 2019 into a 749-kilometer orbit around the planet. EMISAT is a space-based electronic intelligence (ELINT) system developed in an ISRO-DRDO collaboration.²⁹ The satellite aims to locate adversary radar stations precisely by identifying and detecting the electromagnetic emissions from those

²⁷ Namrata Goswami, "India's Space Program, Ambitions, and Activities," *Asia Policy* 15, no. 2 (2020): 43–49, <https://www.jstor.org/stable/27023898>.

²⁸ "Cartosat 3," *National Aeronautics and Space Administration*, July 15, 2024, 3, <https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=2019-081A>.

²⁹ "EMISAT Can Bolster India's Surgical Strike Capability," *The Economic Times*, April 1, 2019, <https://economictimes.indiatimes.com/news/defence/emisat-can-bolster-indias-surgical-strike-capability/articleshow/68670153.cms?from=mdr>.

installations. The Indian military forces now have far better situational awareness because of EMISAT.

▪ ***Gisat Series Satellites***

Compared to previous imaging technologies that could only scan a particular area every 22 days. The Indian Army can now survey and map territories after two days with the Gisat satellites. Gisat provides almost real-time photos of vast areas when there are no clouds. With a geo-imager that can capture images at many wavelengths and resolutions between 50 and 1.5 kilometers, the satellite significantly improves India's capacity to map its territory for both military and non-military uses.³⁰

▪ ***Mission Shakti***

As part of "Mission Shakti," Prime Minister Narendra Modi announced on March 27, 2019, that an anti-satellite missile test had been completed. The low-Earth orbit target satellite, Microsat-R, was destroyed in this test, demonstrating India's accuracy in missile guidance and maneuvering technology. With this test, India advanced its space defense plans to a new level and became the fourth nation, after the US, Russia, and China, to acquire anti-satellite capabilities.³¹

▪ ***Hyperspectral Imaging Satellite (HySIS)***

An important step forward in Earth observation technology was taken on November 29, 2018, when the HySIS was successfully launched. Starting from 630 kilometers above the Earth's surface, the satellite can observe 55

³⁰ "GISAT 1, 2 (EOS 03, 05)," *Gunter's Space Page*, accessed July 15, 2024, https://space.skyrocket.de/doc_sdat/gisat-1.htm.

³¹ "India Shoots down Satellite, Joining Space 'Super League': Modi," *Al Jazeera*, March 27, 2019, <https://www.aljazeera.com/news/2019/3/27/india-shoots-down-satellite-joining-space-super-league-modi>.

different spectral bands.³² The Space Applications Centre of the ISRO in Ahmedabad was responsible for developing its imaging system. On the other hand, the Semi-Conductor Laboratory in Chandigarh was responsible for fabricating its optical imaging chip. HySIS was developed for a wide range of applications, including environmental monitoring, agriculture, forestry, and the evaluation of coastal zones, soils, and inland water resources, in addition to military surveillance.

▪ ***IndSpaceEx***

India had its first joint military space exercise, known as IndSpaceEx, in July 2019, and the DRDO was a key player in determining how equipped India was to counter threats from space. In order to find weaknesses in India's space defense capabilities, this exercise assessed both offensive and defensive tactics, such as directed energy systems and anti-satellite missiles. Following Mission Shakti, IndSpaceEx seeks to fortify India's military tactics in space combat and advance the development of a cohesive doctrine for space-based wars.³³

Regional Implications of India's Space Militarization

The militarization of space by India carries significant consequences for the security framework of South Asia, a region characterized by enduring rivalries, territorial conflicts, and a precarious equilibrium of power. As India enhances its space capabilities for military applications, it presents new challenges and risks that may disrupt the region's security dynamics. The militarization of space serves to augment India's power projection capabilities

³² "ISRO's HySIS Satellite Sends First Image Covering Parts of Lakhpat Area in Gujarat," *India Today*, December 3, 2018, <https://www.indiatoday.in/india/story/isro-s-hysis-satellite-sends-first-image-covering-parts-of-lakhpat-area-in-gujarat-1401733-2018-12-03>.

³³ Shahid Hussain and Khurram Shahzad, "India's Quest for 'Global Space and Influence' through the 'Outer Space' Domain," *Journal of Space Safety Engineering* 10, no. 3 (2023): 351–65, <https://www.sciencedirect.com/science/article/pii/S2468896723000605>.

while simultaneously intensifying existing security dilemmas, thereby catalyzing an arms race and escalating tensions with its neighboring states, notably Pakistan and China. This section examines the implications of India's space militarization on the regional equilibrium of power, the potential for heightened conflict escalation, and the complexities it introduces to crisis management endeavors in South Asia.

▪ ***Disruption of Strategic Balance in South Asia***

India's militarization of space has altered South Asia's geopolitical dynamics. This section analyzes how these trends exacerbate regional instability and complicate the security landscape for Pakistan.

1. The shift in Power Projection and Military Superiority

One of the fundamental ways in which India's militarization of space alters the regional security dynamics, is through its augmented capacity to project power. India enhances its intelligence, surveillance, reconnaissance (ISR), and communication capabilities by integrating space-based assets into its military operations. This technological advantage provides India with enhanced situational awareness, precise targeting capabilities, and immediate access to battlefield information, all of which may prove vital in times of conflict.³⁴

India's space-enhanced military dominance poses a significant challenge for Pakistan. In light of the disparities in traditional military strengths between the two countries, Pakistan views India's progress in space technology as a strategic move to reinforce its supremacy in South Asia. Incorporating space-based intelligence and early warning systems into India's military doctrine would enable precise surveillance of Pakistan's troop movements, missile deployments, and strategic assets. This compromises

³⁴ Raja Qaiser Ahmed, Misbah Arif, and Mahvish Malik, "Emerging Trends of Space Weaponization: India's Quest for Space Weapons and Implications for Security in South Asia," *Astropolitics* 18, no. 2 (May 3, 2020): 158–69, <https://doi.org/10.1080/14777622.2020.1788902>.

Pakistan's strategic deterrence, necessitating Islamabad to pursue countermeasures, such as an increased dependence on nuclear deterrence or advancing its military space capabilities.³⁵

The alteration of the strategic equilibrium brought about by India's military space capabilities introduces an additional dimension of uncertainty in South Asia. In light of potential vulnerabilities to preemptive actions or surveillance, Pakistan might be compelled to embrace a more assertive defense strategy, thereby elevating the likelihood of miscalculations or unintended escalations amid intensified tension.³⁶ India's increasing power projection through space achievements destabilizes the strategic balance in the region, compelling Pakistan to change its military strategies in ways that might elevate the risk of escalation.

2. Impact on Conventional and Nuclear Deterrence

The space militarization by India has significant implications for the dynamics of conventional and nuclear deterrence in South Asia. This section looks into how improvements in space-based capabilities challenge Pakistan's nuclear posture and introduce instability into an already fragile deterrence framework.

The militarization of space by India carries significant consequences for the dynamics of nuclear deterrence in South Asia. The nuclear arsenals of India and Pakistan are maintained with a keen awareness of how mutual perceptions of deterrence stability significantly shape their strategic postures. The advancements made by India in space-based ISR, missile defense systems, and ASAT capabilities pose a significant challenge to Pakistan's

³⁵ Fazal Abbas Awan and Prof Dr Umbreen Javaid, "Space Militarization Race among China-Russia and USA: Implications for South Asia," *South Asian Studies* 1, no. 35 (2021), <https://journals.pu.edu.pk/journals/index.php/IJSAS/article/view/4106>.

³⁶ Summar Iqbal Babar and Abu Hurrairah Abbasi, "Emerging Technologies and the Threat to South Asian Security," *CISS Insight Journal* 11, no. 2 (2023): P40-59, <http://journal.ciss.org.pk/index.php/ciss-insight/article/view/317>.

second-strike capability, which is fundamental to the framework of nuclear deterrence.³⁷

Indian ASAT tests, exemplified by Mission Shakti in 2019, showcased its ability to incapacitate adversarial satellites in low-earth orbit. The capacity to disrupt or obliterate satellites that are essential to Pakistan's nuclear command and control frameworks may undermine Pakistan's assurance in its retaliatory capabilities.³⁸ This subsequently heightens the potential for an arms race in counter-space technologies, as Pakistan may expedite advancing its ASAT or missile defense systems to reestablish strategic equilibrium. Such developments would exacerbate regional tensions and complicate endeavors to uphold arms control in South Asia.

Moreover, India's missile defense systems, possibly augmented by space-based capabilities, have the potential to undermine Pakistan's deterrence strategy by incapacitating its nuclear delivery mechanisms. In light of the circumstances, Pakistan might find it necessary to augment its nuclear capabilities or implement more precarious deployment tactics, including elevating the alert status of its nuclear warheads or situating them in more concealed and varied locations.³⁹ The interplay of these dynamics amplifies the potential for nuclear brinkmanship, thereby fostering an environment of increased instability in South Asia. This has placed severe challenges to conventional and nuclear deterrence in the region, compelling Pakistan into a precarious position where strategic stability is increasingly difficult to maintain.

³⁷ Aruna Kammila, "Militarisation & Weaponisation of Space: Where Does India Stand?," *Issue 6 Int'l JL Mgmt. & Human.* 3 (2020): 13, https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/ijlmhs8§ion=6.

³⁸ Hussain and Ahmed, "Space Programs of India and Pakistan."

³⁹ Dennis M. Rice and USSF Major, "Deterrence and Space Strategy," *Air University Press*, accessed July 15, 2024, https://www.airuniversity.af.edu/Portals/10/AUPress/Papers/SP_02_Rice_Deterrence_and_Space_Strategy.pdf.

▪ ***Complications in Crisis Management and Escalation Control***

Given India's evolving space capabilities, South Asia faces new complexities in managing and controlling the escalation of a crisis. It elaborates on the challenge to crisis stability and the increased risk of misperception and unintended escalation of conflict.

1. Challenges to Crisis Stability

Theoretically, the implications of satellite developments crisis stability can go both ways. Increasing transparency can enhance trust between India and Pakistan. The capacity to observe troop movements, missile deployments, and other strategic assets in real-time could increase trust between India and Pakistan. In crisis situation, this transparency might help in reducing the tension between both states.⁴⁰ However, there is technological disparity between both states. Furthermore, India is developing precision missiles, and there is uncertainty in its No-First-Use Policy. This might increase security dilemma for Pakistan because India can use data gathered using satellites to have better situational awareness. With help of precision missile, it can carry out counterforce strikes.⁴¹ Therefore, the advancements in India's space capabilities introduce complexities to managing crises and controlling escalation within the South Asian region. During increased tension, space-based ISR systems offer immediate intelligence and surveillance, improving early warning capabilities while simultaneously elevating the risks of misperception and miscalculation.⁴²

⁴⁰ Zohaib Altaf and Nimrah Javed, "The Triad of Technology and Its Implications for Strategic Stability in South Asia," *South Asian Voices*, May 2, 2024, <https://southasianvoices.org/sec-c-pk-r-triad-of-technology-05-02-2024/>.

⁴¹ Ibid.

⁴² Ahmed Saeed Minhas, "Space Weapons: A Rapidly Evolving Threat to South Asian Strategic Balance," *Ndu Journal*, 2018, <https://ndujournal.ndu.edu.pk/site/article/view/174/129>.

Furthermore, the existence of anti-satellite capabilities of India contribute to a heightened level of instability during crises. In a scenario characterized by conflict, the allure of incapacitating or annihilating an opponent's satellites—be it for intelligence, surveillance, reconnaissance, communication, or missile detection—can potentially escalate tensions into a full-blown confrontation. Indian ability to target Pakistan's space capabilities might further complicate crisis stability.

Space as a New Domain of Warfare

The militarization of space introduces a novel arena for conflict, characterized by the inadequacy of established rules of engagement and the nascent state of international norms. In South Asia, the existing tensions within conventional and nuclear realms are already laden with peril; the introduction of space as a prospective theater of conflict further complicates the endeavor to uphold strategic stability.⁴³ The lack of definitive regulations surrounding the military utilization of space heightens the potential for unintended escalations, thereby complicating the processes of conflict resolution and de-escalation.

India's development of ASAT weaponry, as displayed by its March 2019 "Mission Shakti" test, is one example of the increasing militarization of space.⁴⁴ The test demonstrated India's growing space warfare capabilities by successfully intercepting and destroying one of its low-Earth orbit satellites. India's demonstration of ASAT capabilities sparked intense domestic and international reactions due to concerns over its potential to disrupt regional stability and trigger an arms race. Pakistan, viewing this development as a

⁴³ Zulfqar Khan and Ahmad Khan, "Space Security Trilemma in South Asia," *Astropolitics* 17, no. 1 (January 2, 2019): 4–22, <https://doi.org/10.1080/14777622.2019.1578931>.

⁴⁴ "Mission Shakti," *Defense Research and Development Organization*, accessed July 2, 2024, <https://www.drdo.gov.in/drdo/mission-shakti>.

direct threat to its security, called for international attention and measures to address the emerging risks.⁴⁵

Moreover, the absence of well-defined communication pathways for incidents about space, such as unintended satellite collisions or disruptions to space-based assets, intensifies the potential for misinterpretation during critical situations. As the realm of space increasingly transforms into a contested arena, the imperative for regional confidence-building initiatives and discourse surrounding space security intensifies. This is essential to avert the potential militarization of space from exacerbating terrestrial conflicts.⁴⁶

The militarization of space by India presents a considerable challenge to the security dynamics of South Asia. India has disturbed the strategic balance in the region with its space technology achievements, including its ASAT capabilities and improvements in space-based reconnaissance, surveillance, and communication systems. For example, India's RISAT satellite series significantly tips the scales in its favor by improving its military's capacity to undertake reconnaissance and surveillance in all weather conditions.⁴⁷ These events increase the likelihood of conflict in the area and worsen already-existing tension.

Pakistan is likely to adopt policy solutions in response to Indian space developments, such as nuclear modernization, the creation of space-based technologies, or strategic alliances with China, which has also shown notable progress in space capabilities due to increased susceptibility to India's

⁴⁵ "Mission Shakti: Pakistan Urges World to Slam India, China Calls for Peace," *India Today*, March 27, 2019, <https://www.indiatoday.in/world/story/mission-shakti-anti-satellite-missile-pakistan-china-1487866-2019-03-27>.

⁴⁶ Misbah Arif, "Strategic Landscape of South Asia and Prevention of Arms Race in Outer Space," *Astropolitics* 17, no. 1 (January 2, 2019): 51–61, <https://doi.org/10.1080/14777622.2019.1578934>.

⁴⁷ "What Is ISRO's RISAT Satellite Series?" *The Indian Express* (blog), May 13, 2019, <https://indianexpress.com/article/what-is/isro-radar-imaging-satellite-risat-series-pslv-5724063/>.

enhanced military capabilities.⁴⁸ One instance of Pakistan's efforts to offset India's technological superiority is its partnership with China on the Pakistan Remote Sensing Satellite (PRSS-1).⁴⁹

Security Implications for Pakistan

Pakistan, as a neighboring country to India, is intricately linked to the security dynamics shaped by Indian space militarization efforts. Indian development of advanced space capabilities has significant implications for Pakistan's national security, strategic calculations, and defense posture. This section explores the multifaceted security implications for Pakistan, focusing on strategic vulnerabilities, technological competition, diplomatic responses, and future mitigation strategies.

A. Strategic Vulnerabilities and Threat Perceptions

For Pakistan's national security, the developments in Indian space technologies present multiple challenges. These include weaknesses induced by India's enhanced communication, navigation, and satellite spying capabilities. This section elaborates on specific places that seriously challenge Pakistan's security environment.

- ***Satellite Surveillance and Reconnaissance***

India's space-based surveillance and reconnaissance capabilities significantly challenge Pakistan's national security. The ability to monitor border areas, track military movements, and gather real-time intelligence through satellite imagery gives India an upper hand in situational awareness and threat assessment. This enhanced surveillance capability raises concerns for Pakistan regarding strategic vulnerabilities, preemptive strikes, and asymmetrical

⁴⁸ Abu Hurairah Abbasi and Saher Liaqat, "Energy Diplomacy in Practice: China's Role as a Global Energy Leader," *Pakistan Journal of Integrated Social Sciences (PJISS)*, June 23, 2024, <https://journals.uol.edu.pk/PJISS/article/view/3594>.

⁴⁹ "Pakistan Remote Sensing Satellite (PRSS-1)," *SUPARCO*, accessed July 2, 2024, <https://suparco.gov.pk/major-programmes/projects/prss-1/>.

advantages in potential conflicts.⁵⁰ The deployment of high-resolution imaging satellites, such as the Cartosat series, allows India to closely monitor sensitive areas, military installations, and infrastructure developments along the India-Pakistan border. This not only aids in border security but also enhances India's ability to gather intelligence on Pakistan's military activities, deployments, and strategic capabilities.

- ***Communication Interception and Jamming***

India's utilization of satellite communication for military purposes enables secure and reliable command, control, and communication networks. However, these communication channels' potential interception, jamming, or disruption poses a significant challenge to Pakistan's information security and operational capabilities. India's space-based communication systems could be targeted or manipulated in a conflict or crisis, impacting Pakistan's ability to maintain operational secrecy, command hierarchy, and coordinated responses.⁵¹ Pakistan needs to invest in resilient and secure communication infrastructure, including encryption technologies, frequency-hopping techniques, and backup systems, to mitigate the risks of communication disruptions or cyberattacks targeting space-based assets.

- ***Navigation and Targeting Capabilities***

India's deployment of navigation satellites, such as NavIC, enhances its military's precision navigation and targeting capabilities. This poses challenges for Pakistan regarding countering accurate targeting, navigational support for military operations, and potential encirclement scenarios

⁵⁰ Akash Shah, "Deterrence Under Surveillance: Indian Space-Based ISR Capabilities and Pakistan's Nuclear Deterrence," *Journal of Security & Strategic Analyses* 8, no. 2 (2022): 07–26.

⁵¹ Amjad Mahmood and Adil Sultan, "Impact of India's ISR Capabilities on South Asian Security Dynamics," *Strategic Studies* 41, no. 4 (2021): 17–39, https://strategicstudies.org.pk/index.php/strategic_studies/article/view/40/4.

facilitated by space-based assets.⁵² Integrating NavIC with India's missile defense systems, aerial platforms, and maritime operations enhances India's overall operational effectiveness and strategic deterrence posture. Pakistan must enhance its navigation and targeting capabilities, invest in robust anti-jamming technologies, and develop alternative navigation systems to reduce dependency on foreign navigation aids and mitigate the risks of India's space-based assets. Thus, India's space advancements amplify Pakistan's strategic vulnerabilities by enhancing its intelligence, communication, and targeting capabilities. Resilient technological solutions and strategic countermeasures are necessary to address these challenges.

B. Technological Competition and Arms Race Dynamics

South Asia has witnessed a technological race due to India's fast-paced advancements in space militarization. This section explains how Pakistan is forced to react to India's moves by increasing its space capabilities to sustain strategic parity.

- ***Race for Space Dominance***

India's advancements in space technology and militarization contribute to a regional race for space dominance and technological superiority. Pursuing space-based assets, anti-satellite capabilities, and space-based weapon systems fosters an arms race dynamic beyond conventional military domains. Pakistan faces pressure to match India's space capabilities, develop countermeasures, and invest in indigenous space technologies to maintain strategic parity and deterrence stability.⁵³ The escalation of space-related

⁵² Abeer Iftikhar Tahirkheli, "India's Strategic Force Modernization and Its Implications on Strategic Environment of Pakistan," *Strategic Thought* 4, no. 1 (2022): 155–71, <https://strategicthought.ndu.edu.pk/site/article/view/83>.

⁵³ Amjad Mahmood and Adil Sultan, "Impact of India's ISR Capabilities on South Asian Security Dynamics," *Strategic Studies* 41, no. 4 (2021): 17–39, https://strategicstudies.org.pk/index.php/strategic_studies/article/view/40/4.

capabilities, including space-based ISR, satellite communication, and navigation systems, underscores the need for Pakistan to prioritize its space program, enhance space situational awareness, and develop response strategies to address emerging space threats.

- ***Deterrence and Strategic Stability***

India's space militarization efforts influence South Asia's deterrence dynamics and strategic stability. Integrating space assets into military doctrines, contingency planning, and crisis management strategies enhances India's deterrence posture and operational capabilities across multiple domains. Pakistan's national security calculus must account for space-enabled threats, space-based missile defense systems, and space warfare strategies that could alter the dynamics of conflict escalation and crisis stability.⁵⁴ Maintaining strategic stability in space requires dialogue, transparency, crisis communication channels, and Confidence Building Measures (CBMs) Pakistan and India. Bilateral agreements, arms control initiatives, and space-related CBMs can reduce the risks of space-related conflicts and promote mutual understanding in responsibly managing space assets.

C. Diplomatic and Policy Responses

Diplomacy would be paramount in addressing the threats of Indian space militarization. Pakistan's diplomatic and policy tools for maintaining regional stability with peaceful space activities are laid out in this section.

- ***Diplomatic Engagement and CBMs***

Pakistan engages in diplomatic initiatives to address space-related security concerns, promote transparency, and advocate for arms control measures in space governance forums. Efforts to enhance dialogue, communication

⁵⁴ Summar Iqbal Babar and Abu Hurairah Abbasi, "Emerging Technologies and the Threat to South Asian Security," *CISS Insight Journal* 11, no. 2 (2023): P40-59, <http://journal.ciss.org.pk/index.php/ciss-insight/article/view/317>.

channels, and crisis management mechanisms contribute to regional stability and conflict prevention.⁵⁵ Engagement in multilateral forums such as the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), Conference on Disarmament (CD), and regional space cooperation organizations provides avenues for discussing space security, space debris mitigation, and peaceful uses of outer space. Pakistan's active participation in diplomatic initiatives underscores its commitment to responsible space behaviors, peaceful coexistence, and international cooperation in space activities.

- ***Space Policy and Capability Development***

Pakistan's space policy formulation and capability development strategies are guided by its national security imperatives, technological ambitions, and strategic interests. Investments in satellite technology, launch capabilities, space situational awareness, and space-based applications for civilian and military purposes reflect Pakistan's evolving space program and security considerations.⁵⁶ Collaboration with international partners, including China, Russia, and Europe, in space technology transfer, satellite development, and space research enhances Pakistan's space capabilities and strategic autonomy. Developing indigenous space technologies, fostering innovation, and strengthening regulatory frameworks contribute to Pakistan's space resilience and competitiveness in the evolving space domain. Pakistan's diplomatic engagement and policy framework are necessary for countering the destabilizing impact of Indian space militarization. These reflect Pakistan's commitment to international norms and its pursuit of strategic resilience.

⁵⁵ "Pakistan Favours Keeping Outer Space Free of Weapons," *Dawn*, May 8, 2024, <https://www.dawn.com/news/1832131>.

⁵⁶ Zohaib Altaf and Nimra Javed, "Pakistan's New Space Policy: Overcoming Historical Challenges and Embracing a New Era," *The Diplomat*, December 16, 2023, <https://thediplomat.com/2023/12/pakistans-new-space-policy-overcoming-historical-challenges-and-embracing-a-new-era/>.

D. Future Trends and Mitigation Strategies

In response to Space militarization, forward-looking strategies are required. The following section will discuss key trends and mitigation measures for Pakistan.

- ***Enhancing Space Situational Awareness***

Pakistan should prioritize enhancing its space situational awareness (SSA) capabilities to monitor space traffic, track satellite movements, and identify potential threats in orbit. Collaborative efforts with international partners, access to space surveillance data, and investments in ground-based and space-based sensors are crucial for improving SSA and mitigating space-related risks.⁵⁷ Developing space debris mitigation strategies, collision avoidance protocols, and space traffic management frameworks contribute to space sustainability and reduce the risks of space collisions, debris proliferation, and satellite vulnerabilities. Pakistan's participation in global initiatives such as the Space Surveillance Network (SSN), Space Data Association (SDA), and International Collaboration for Space Situational Awareness (ICSSA) enhances its SSA capabilities and promotes responsible space behaviors.

- ***Strengthening Cybersecurity and Resilience***

Integrating space assets with terrestrial networks and communication systems necessitates robust cybersecurity measures to protect against cyber threats, data breaches, and space-based vulnerabilities. Pakistan should invest in cybersecurity infrastructure, encryption technologies, intrusion detection systems, and secure communication protocols to safeguard space assets and prevent unauthorized access or interference. Establishing cyber resilience frameworks, conducting cybersecurity audits, and developing incident

⁵⁷ "Prioritising Space Situational Awareness in Your Geo-Spatial Intelligence Strategy," DGI Geo-Spatial Intelligence for National Security, accessed July 02, 2024, <https://dgi.wbresearch.com/blog/space-situational-awareness-geospatial-intelligence-strategy>.

response capabilities are essential for ensuring the integrity, availability, and confidentiality of space-related data and operations. Collaboration with international cybersecurity organizations, information-sharing platforms, and best practice guidelines enhances Pakistan's cyber resilience posture and space asset protection.

- ***Promoting Responsible Space Behaviors***

Pakistan advocates for responsible space behaviors, adherence to international space law, and peaceful uses of outer space in its diplomatic engagements and policy initiatives. Participating in space governance forums, supporting space debris mitigation guidelines, and promoting transparency in space activities contribute to global space security and stability.⁵⁸

Emphasizing the prevention of space weaponization, the peaceful resolution of space-related disputes, and promoting space cooperation for scientific exploration and socioeconomic development aligns with Pakistan's commitment to international norms and regulations governing space activities.⁵⁹ Collaboration with like-minded space-faring nations, advocacy for space sustainability principles, and capacity-building initiatives in space law and policy enhance Pakistan's role as a responsible space actor in the global arena.

The security implications for Pakistan arising from Indian space militarization underscore the complex interplay between technological advancements, strategic imperatives, diplomatic engagements, and policy

⁵⁸ "Statement by the Delegation of Pakistan on Agenda Item 51: International Cooperation in the Peaceful Uses of Outer Space (Fourth Committee)," n.d., https://www.un.org/en/ga/fourth/pdf/PakistanEN_item_51.pdf.

⁵⁹ Sahar Iqbal, "Pakistan's National Space Policy," International Bar Association, June 18, 2024, <https://www.ibanet.org/national-space-policy-pakistan>.

responses in the space domain.⁶⁰ Pakistan's proactive approach to enhancing space capabilities, promoting responsible behaviors, and engaging in international cooperation is essential for safeguarding its national interests, ensuring space security, and contributing to a peaceful and sustainable space environment. Collaborative efforts, diplomatic initiatives, and strategic investments are key to addressing emerging space challenges, managing space-related risks, and fostering regional and global cooperation for mutual benefit and shared security in outer space.

Recommendations

Following policy recommendations can be adopted by the policymakers to reduce the risk of arms escalation in South Asia:

- Pakistan and India must develop CBMs focused on specific space-related security aspects to address the security issues and prevent any kind of arms race. Increased clarity regarding space policies and reciprocal commitments to avoid the weaponization of space may alleviate tensions.⁶¹
- Establishing crisis communication channels between Pakistan and India is imperative because of the significant risks associated with miscalculations in militarized space. These technologies would enable real-time communication in response to perceived threats or incidents in space.
- Facilitating regional collaboration in space technology through impartial platforms may contribute to the reduction of tensions.

⁶⁰ Nasreen Akhtar, "Emerging Challenges to Deterrence Stability in South Asia: A Theoretical Analysis," *Journal of Security & Strategic Analyses* 8, no. 2 (2022): 145–62, <https://jssa.thesvi.org/index.php/ojs/article/view/156/134>.

⁶¹ Tughral Yamin and Cooperative Monitoring Center, "Developing Information-Space Confidence Building Measures (CBMs) between India and Pakistan," accessed July 2, 2024, <https://www.sandia.gov/app/uploads/sites/148/2021/07/SAND2014-4934-2.pdf>.

Collaborative initiatives addressing common issues, such as climate monitoring or catastrophe management, may cultivate trust.⁶²

To rectify disparities in space capabilities, Pakistan must prioritize investments in its domestic space technology while pursuing collaborations with allies such as China to enhance its standing in the regional security framework.

Conclusion

Exploring India's space militarization and its implications for regional and global security reveals a complex and evolving landscape with multifaceted dimensions. The security implications for neighboring countries, particularly Pakistan, underscore the challenges and strategic considerations arising from India's space militarization efforts. The enhanced surveillance capabilities, communication networks, and navigation systems pose strategic challenges, necessitating the recalibration of defense strategies, crisis management protocols, and deterrence postures. Indian space militarization, therefore, underscores the evolving challenges and opportunities in space security, necessitating a concerted effort from the international community to address emerging risks, promote responsible space behaviors, and ensure a secure and sustainable space environment. Efforts to address space sustainability, space traffic management, orbital debris mitigation, and space situational awareness sharing are imperative for preventing space collisions, protecting space assets, and preserving the space environment for future generations. International cooperation mechanisms, diplomatic initiatives, and adherence to space governance frameworks are essential for managing space-related risks and promoting a secure and sustainable space domain.

⁶² Abu Hurairah Abbasi and Saheer Liaqat, "India and Pakistan Must Collaborate to Combat Winter Smog," *South Asian Voices*, November 13, 2024, <https://southasianvoices.org/geo-c-pk-r-india-pak-smog-diplomacy-11-13-2024/>.

**ASSESSMENT OF INDIA'S NUCLEAR
SECURITY ARCHITECTURE**

Anum A. Khan

Assessment of India's Nuclear Security Architecture

Anum A. Khan*

Abstract

This paper is an attempt to assess Indian nuclear security architecture in the light of recurrent Indian nuclear security incidents and their impact on national regional and global non-proliferation efforts. India is one of the significant global nuclear energy markets for Russia and US alike. Nevertheless, nuclear safety and security incidents including uranium thefts in India have increased concerns regarding Indian nuclear security architecture. The study utilizes International Nuclear Security Framework to assess the Indian nuclear security architecture. This research aims to analyze Indian nuclear safety and security measures by exploring Indian uranium theft incidents, nuclear security lapses and over all gaps in Indian nuclear security architecture. Through this analysis, the study explores Indian nuclear credentials and its adherence to global nuclear nonproliferation standards and norms. This study further investigates how such incidents impact Indian nuclear credentials vis-à-vis global nuclear governance and provides recommendations for India to enhance its nuclear security infrastructure to reduce the risk of such incidents thereby, enhance its nuclear non-proliferation credentials.

Keywords: Nuclear Safety, Nuclear Security, Indian Nuclear Program, Uranium Theft

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Introduction

As an important player in the global nuclear energy market, India continues to modernize its nuclear program for its civilian and military purposes. Nevertheless, recent nuclear security incidents including uranium thefts have raised concerns regarding India's nuclear security architecture. These incidents not only highlight inadequacy of Indian nuclear security infrastructure, but also raise concerns regarding its adherence to international nuclear non-proliferation norms. According to the International Atomic Energy Agency (IAEA), nuclear security is "*Prevention of, detection of, and response to, criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities, or associated activities.*"¹

To understand the role of IAEA in nuclear security and India's nuclear security architecture, multiple studies have been conducted. Carmona outlines the IAEA's role in assisting member states to prevent and respond to nuclear terrorism through a comprehensive global nuclear security program.² Donohue highlights advancements in IAEA safeguards, particularly the use of environmental sampling and analysis, which strengthen the detection of undeclared nuclear activities.³ Fedchenko examines the challenges faced by the IAEA during armed conflicts, such as the attacks on nuclear facilities in

¹ IAEA, "IAEA Safety and Security Series," Official Website, IAEA, 2023, https://nucleus-apps.iaea.org/nss-oui/Content/Index?CollectionId=m_8810942f-6fa7-4b88-a185-0c7005431b32&type=PublishedCollection.

² United Nations Office for Disarmament Affairs, "IAEA: Assistance in Nuclear Security," United Nations Office of Disarmament Affairs (UNODA) Occasional Papers (UN, 2008), 121–45.

³ D.L. Donohue, "Strengthening IAEA Safeguards through Environmental Sampling and Analysis," *Journal of Alloys and Compounds* 271–273 (June 1998): 11–18, [https://doi.org/10.1016/S0925-8388\(98\)00015-2](https://doi.org/10.1016/S0925-8388(98)00015-2).

Ukraine.⁴ Uadiale explores the IAEA's contributions to international diplomacy, highlighting its role in promoting sustainable nuclear security. Despite challenges, the agency has been instrumental in fostering peace and mitigating threats posed by non-state actors.⁵ Singh discusses the IAEA's role in facilitating peaceful uses of nuclear technology while enforcing safeguards to prevent proliferation.⁶ Langlois examines the IAEA's response to the Fukushima disaster, highlighting the development of a comprehensive action plan that incorporates safety reviews and emergency preparedness measures.⁷

Deolalikar highlights that safety in India's nuclear power plants (NPPs) is of paramount importance and governed by strict regulations, including radiological protection for workers and the public, regular surveillance, and comprehensive emergency preparedness plans.⁸ Moses Raj examines the implications of the Additional Protocol ratified by India, which separates civilian and military nuclear facilities.⁹ Joshi with co-authors focus on the core safety features of Indian nuclear reactors, particularly heavy water reactors, in extreme conditions like tsunamis.¹⁰ Neeraj examines the

⁴ Vitaly Fedchenko, "Nuclear Security During Armed Conflict: Lessons From Ukraine" (Stockholm International Peace Research Institute, 2023), <https://doi.org/10.55163/ZZSP5617>.

⁵ Martin Uadiale, "International Atomic Energy Agency (Iaea) And The Diplomacy Of Sustainable International Nuclear Security," 2011, [https://www.semanticscholar.org/paper/INTERNATIONAL-ATOMIC-ENERGY-AGENCY-\(IAEA\)-AND](https://www.semanticscholar.org/paper/INTERNATIONAL-ATOMIC-ENERGY-AGENCY-(IAEA)-AND).

⁶ A. Singh, "IAEA and Cooperation in Nuclear Technology," 2012, https://www.semanticscholar.org/paper/IAEA-and-Cooperation-in-Nuclear-Technology-Singh/f5e92c051325a174a758326448d6341607405c4c?utm_source=consensus.

⁷ L. Langlois, "IAEA Action Plan on Nuclear Safety," *Energy Strategy Reviews* 1 (2013): 302–6, <https://doi.org/10.1016/J.ESR.2012.11.008>.

⁸ R Deolalikar, "Safety in Nuclear Power Plants in India," *Indian Journal of Occupational and Environmental Medicine* 12, no. 3 (2008): 122, <https://doi.org/10.4103/0019-5278.44693>.

⁹ Moses Raj G S, "Nuclear Safety in India: The Balancing Rope of Domestic Energy Demand and International Safeguards Regime," *Jindal Journal of International Affairs* 4, no. 1 (October 1, 2016): 60–84, <https://doi.org/10.54945/jjia.v4i1.55>.

¹⁰ J B Joshi et al., "Core Safety of Indian Nuclear Power Plants (NPPs) under Extreme Conditions," *Sadhana* 38, no. 5 (October 2013): 945–70, <https://doi.org/10.1007/s12046-013-0177-6>.

cybersecurity framework for Indian nuclear facilities, emphasizing vulnerabilities to cyberattacks.¹¹ Thomas and Gupta analyze India's nuclear policy and its implications for national and regional security.¹² They highlight the challenges in balancing nuclear ambitions. Raj et al. discuss India's radioactive waste management practices, emphasizing the development of innovative processes for waste treatment and disposal.¹³

Previous studies discuss multiple dynamics of the IAEA nuclear security framework. Furthermore, authors have also discussed different aspects of Indian nuclear security architecture. However, as these incidents are continuously occurring, it demands a new study in light of new incidents to understand the current status of Indian nuclear safety and security measures. In this paper, gaps and systemic weaknesses in Indian nuclear security architecture are analyzed through these incidents, which can have domestic and global repercussion through either illicit trafficking of dangerous materials or nuclear terrorism. The study is also an attempt to investigate the impact of such gaps in Indian nuclear security credentials within global nuclear non-proliferation framework. As the repercussions of any nuclear safety and security incidents do not respect borders, this issue is critical for domestic, regional and global security. The paper also provides recommendations for mitigating any future nuclear risks. If not, such incidents may indicate that India is not a responsible nuclear state. This study utilizes "International Nuclear Security Cooperation framework" that refers to "a system of international agreements, norms, and mechanisms established

¹¹ Neeraj B R, "Cybersecurity in Indian Nuclear Facilities," *Electronic Journal of Social and Strategic Studies* 04, no. 03 (2024): 314–38, <https://doi.org/10.47362/EJSSS.2023.4302>.

¹² Gaurav Kampani, "India's Nuclear Security. Edited by Raju G. C. Thomas and Amit Gupta. Boulder, Colo.: Lynne Rienner Publishers, 2000. 325 Pp. \$59.95.," *The Journal of Asian Studies* 60, no. 2 (May 2001): 598–600, <https://doi.org/10.2307/2659762>.

¹³ K. Raj, K.K. Prasad, and N.K. Bansal, "Radioactive Waste Management Practices in India," *Nuclear Engineering and Design* 236, no. 7–8 (April 2006): 914–30.

primarily through the IAEA to prevent the theft, misuse, or proliferation of nuclear materials by facilitating cooperation between nations to enhance nuclear security measures and respond to potential threats, including nuclear terrorism; it includes legally binding instruments like the Convention on the Physical Protection of Nuclear Material (CPPNM) and non-binding guidelines for best practices in nuclear security.”

1. International Nuclear Security Cooperation

IAEA is the major international organization which has taken a leading role in dealing with safety, security and peaceful uses of nuclear energy. To counter nuclear risk, IAEA uses a three-part strategy. This includes prevention of non-peaceful use of nuclear material, detection of such non-peaceful use, and proactive and prompt recommendations to United Nations Security Council when such risks are detected. India adheres to IAEA nuclear security guidelines.

The main component of international nuclear security regime is United Nations which provides international infrastructure on nuclear security. The International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) – entered into force in 2007 and adopted in 2005—entails protection against attacks on nuclear installations and facilities through domestic criminalization of planning, executing or threatening of nuclear terrorism. India signed as well as ratified ICSANT while including a reservation that “India does not consider itself bound by the provision of Paragraph (1) of Article 23.”¹⁴ The article states:

Any dispute between two or more States Parties concerning the interpretation or application of this Convention which cannot be settled through negotiation within a reasonable time shall, at

¹⁴ “United Nations Treaty Collection,” United Nations, accessed July 25, 2024, https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XVIII-15&chapter=18&Temp=mtdsg3&clang=_en.

the request of one of them, be submitted to arbitration. If, within six months of the date of the request for arbitration, the parties are unable to agree on the organization of the arbitration, any one of those parties may refer the dispute to the International Court of Justice, by application, in conformity with the Statute of the Court.

This reservation undermines interstate cooperation and accountability to address nuclear terrorism, thereby decreasing convention's effectiveness to counter nuclear threats.

UN Security Council Resolution 1540 entails the prevention of non-state actors from acquiring weapons of mass destruction (WMD) including their materials, delivery systems and weapons. It is an attempt to criminalize receiving, using, financing or further transferring WMDs to any non-state actors. For this purpose, states are obligated to enforce effective domestic mechanisms for control, accounting, physical protection and border control infrastructure. India submitted 7th report to UNSCR 1540 on 4 August 2023. In the report, India focused on its national framework, legislative measures as well as inter agency framework to comply with UNSC Resolution 1540. Solely internal, domestic and government-led self-regulation may hinder international independent verification and external oversight. This will further create gaps to ensure full compliance with international export control standards regarding WMDs.

The Global Initiative to Combat Nuclear Terrorism (GICNT) is a non-binding voluntary framework aimed at prevention, detection and response to nuclear terrorism. In 2007, India became a part of GICNT India adheres to the GICNT mandate, but recurrent nuclear theft incidents show that the country

faces significant challenges regarding physical protection and regulatory oversight of nuclear material.¹⁵

Furthermore, the Convention on, “the Physical Protection of Nuclear Material” demands from states to take definite measures. According to this convention states must “make specific arrangements and meet defined standards of physical protection for international shipments of nuclear material for peaceful purposes (plutonium, uranium 235, uranium 233 and irradiated fuel), according to Annexes I and II and IAEA INFCIRC/225”.¹⁶ It also states, a state “undertake not to export or import nuclear materials or to allow their transit through their territory unless they have received assurances that these materials will be protected during international transport in accordance with the levels of protection determined by the Convention.” In addition, following are the important points of this convention:

- “co-operate in the recovery and protection of stolen nuclear material, by sharing information on missing nuclear materials.
- criminalize specified acts, including misusing or threatening to misuse nuclear materials to harm the public; and
- prosecute or extradite those accused of committing such acts. States Parties undertake to include those offenses as extraditable offenses in every future extradition treaty to be concluded between them.”¹⁷

Indian Nuclear Security Architecture

The security protocols that India follows for nuclear security include:¹⁸

¹⁵ Rahat Iqbal, Murad Ali “Lapses in Indian Nuclear Security Mechanism and Its Broader Implications,” *PolicyEast*, accessed July 25, 2024, <https://policyeast.com/lapses-in-indian-nuclear-security/>.

¹⁶ Bettauer.

¹⁷ Bettauer.

¹⁸ Government of India, AERB “Security of Radioactive Sources in Radiation Facilities,” March 2011.

- 1) deter unauthorized access to the source or source location, in order to deter theft;
- 2) detect any such attempts at unauthorized access;
- 3) delay unauthorized access or theft;
- 4) provide rapid response to attempts at unauthorized access or theft; and ensure the reliability of personnel involved in managing sources.

Indian nuclear security architecture consists of four major elements. These include international cooperation, national governance framework, institutions, technology and nuclear security practice and culture. India is a signatory to the Convention on the Physical Protection of Nuclear Material (CPPNM) and its amendment in 2005 for the protection of nuclear material and facilities from thefts and sabotage. Nevertheless, the implementation of this convention at national regulatory framework faces certain challenges as is evident from nuclear thefts in India.¹⁹ Also, the international regulatory oversight is lacking for Indian unsafeguarded civil nuclear facilities, thereby, increasing the probability of more nuclear theft incidents in the future.

2. Governance Framework and Institutions

Regarding Indian governance framework, the Prime Minister of India is the ultimate authority and has responsibility for the oversight of atomic energy and relevant policies. Nuclear polices and their respective guidance and direction is the mandate of Atomic Energy Commission (AEC). The responsibility of implementation and programs regarding atomic energy is the Department of Atomic Energy (DAE). The Atomic Energy Regulatory Board (AERB) is the major agency which deals with safety and security compliance regarding nuclear facilities, however it is dependent on and controlled by

¹⁹ "Evaluating Nuclear Trafficking Threat in India," *Asiainfreepress* (blog), September 20, 2021, <https://www.asiainfreepress.com/en/review/perspective/evaluating-nuclear-trafficking-threat-in-india/>.

AEC. Analysts also argue that AERB has no jurisdiction in deciding, increasing or imposition of fines and penalties or altering nuclear regulations to counter nuclear security offenses.²⁰

The Bhabha Atomic Research Centre (BARC) is responsible for nuclear related research. Furthermore, Nuclear Power Corporation of India Limited (NPCIL) is responsible for smooth operation of the Nuclear Power Plants (NPPs). Indira Gandhi Centre for Atomic Research (IGCAR) is responsible for research in the field of nuclear sciences. Uranium mining as well as fuel manufacturing comes under Uranium Corporation of India Limited (UCIL). The Electronics Corporation of India Limited (ECIL) is responsible for development and supply of electronics for nuclear facilities. Radiation and Isotope technologies and their research and applications come under the Board of Radiation and Isotope Technology (BRIT). Lastly, international collaboration regarding nuclear security is overseen by the Global Centre for Nuclear Energy Partnership (GCNEP). Following is the hierarchical structure of India's atomic energy establishment .

²⁰ Union Government Department of Atomic Energy "Report of the Comptroller and Auditor General of India on Activities of Atomic Energy Regulatory Board," n.d.

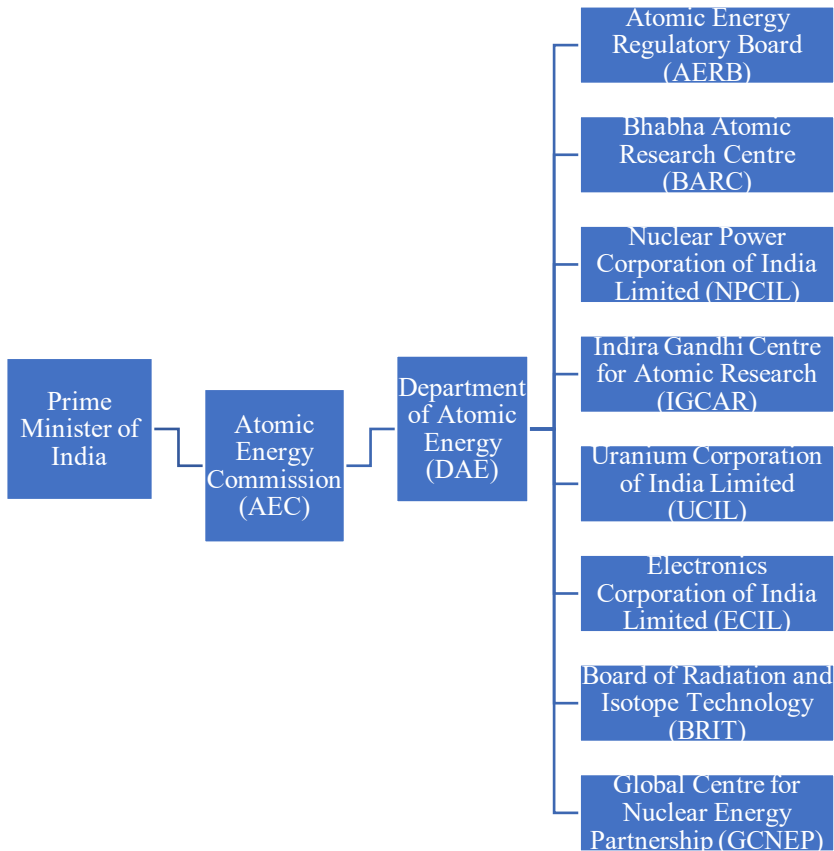


Figure 1: Hierarchical Structure of India's Atomic Energy Establishment

Laws that deal with legal issues vis-à-vis nuclear security in India include:

- a) Atomic Energy Act 1962
- b) Rules on Safe Disposal of Radioactive Waste 1987
- c) Radiation Protection Act 2004
- d) The Foreign Trade Development Act 1992
- e) Weapons of Mass Destruction Act 2005

India has a specially trained para-military force 'Central Industrial Security Force' which is deployed at the nuclear facilities for their security which works under the Ministry of Home Affairs.

3. Indian Nuclear Security Culture

Nuclear security is a national responsibility, and nuclear security culture plays a vital role in enhancing nuclear security of a country. India's nuclear security culture is evolving. Nevertheless, the recent incidents show that the application Indian nuclear security culture has either become redundant or are not changed according to the requirements of the global nuclear security environment. If India possesses world's best nuclear technology and infrastructure, it will face security risks if nuclear security culture is not practiced. For instance, the implementation of norms and rules for stringent nuclear security mechanisms must be adopted to ensure nuclear security and safety. For instance, according to Jayarajan Kutuvan Bhabha Atomic Research Centre, nuclear security culture often evolves slowly as it resists change.²¹ This is often reflected in the saying that "good security is 20% equipment and 80% people."²²

To teach nuclear security programs to security personnel, individuals in the nuclear field as well as agencies, under the GCNEP, India has only one school on nuclear security. The Homi Bhabha National Institute (HBNI) offers a one-year training program under which nuclear security is one section of the course. Furthermore, nuclear facilities and regulators also conduct workshops and seminars on nuclear security. Since 1991 India has been unable to halt

²¹ Jayarajan Kutuvan, "Building Robust Nuclear Security Culture in Nuclear Research Centers" (IAEA, n.d.).

²² National Academy of Sciences; National Institute for Advanced Studies, Bangalore, India; Committee on International Security and Arms Control; Committee on India-United States Cooperation on Global Security: Technical Aspects of Civilian Nuclear Materials Security; Rita Guenther, Micah Lowenthal, Rajaram Nagappa, and Nabeel Mancheri, Rapporteurs, "India-United States Cooperation on Global Security: Summary of a Workshop on Technical Aspects of Civilian Nuclear Materials Security | The National Academies Press," accessed July 29, 2024, https://nap.nationalacademies.org/catalog/18412/india-united-states-cooperation-on-global-security-summary-of-a?utm_expid=4418042-5.krRTDpXJQISoXLpdolYnw.0&utm_referrer=http%3A%2F%2Fissp.in%2Findia-united-statescooperation-on-global-security%2F.

uranium thefts, place all its civil nuclear facilities under IAEA safeguards, and protect its nuclear facilities from cyber-attacks.

A. Incidents of Uranium Thefts in India

There are grave risks if such material gets into wrong hands. For instance, the stolen nuclear material could be used to make a dirty bomb, thereby, the increase in such incidents of theft of nuclear material could result in nuclear terrorism. Nuclear terrorism can be defined as, “acts of violence and destruction performed by non-state actors where the means applied are nuclear explosive devices – or threats of such actions – with the purpose of inflicting destruction, creating a condition of fear, getting attention, blackmailing, installing instability, and to affect an audience beyond the victim directly targeted.”²³

²³ <http://www.idsa.in/system/files/Monograph27.pdf>

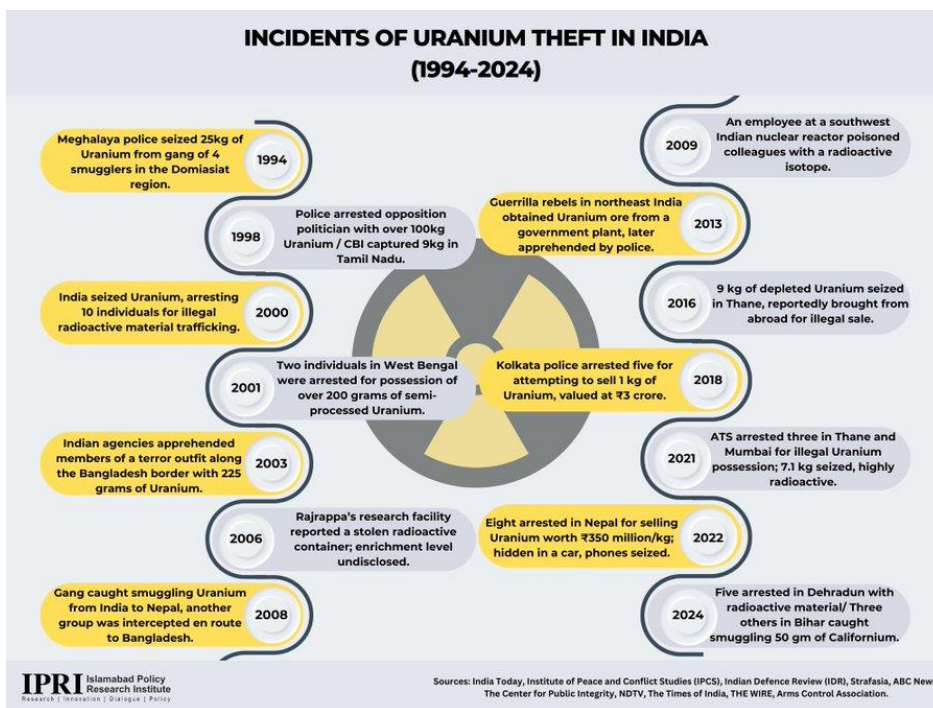


Figure II: Incidents of Uranium Theft in India²⁴

The above infographic shows that there have been three kinds of uranium theft incidents. Firstly, uranium was stolen by insiders working at the nuclear facilities like the incident in 2009. Secondly, individuals were caught who wanted to proliferate such material outside the country as an illegal export or import – indicating possible links to nuclear black market. Thirdly, there were incidents which involved non-state actors seizing nuclear material. There can be many repercussions because of inadequate nuclear security of facilities and material.

²⁴ Islamabad Policy Research Institute [@IPRI_Pak], “IPRI Infographics| Incidents of Uranium Theft in India Here’s an Infographic Mapping Uranium Thefts in India in the Past 30 Years #India #Uranium #Nuclear #NuclearPower #NuclearTheft @iaeaorg @UN @NTI_WMD <https://t.co/IcN9HV305i>,” Tweet, *Twitter*, July 25, 2024, https://x.com/IPRI_Pak/status/1829866732309389380.

B. Indian Safeguarded and Unsafeguarded Civilian Nuclear Facilities

Indian civil nuclear facilities consist of fast breeder reactors and pressurized heavy water reactors (PHWRs). India is also increasingly interested in thorium-based breeders because of its indigenous thorium reserves.²⁵ In March 2024, India commenced the fuel loading of its MWE 500 fast breeder reactor.²⁶ As much as Indian nuclear program is expanding, the need for stringent nuclear security measures has also become increasingly evident.

As part of 2008 Indo-US Civil Nuclear Agreement, India has put some of its civilian nuclear facilities under IAEA Safeguards. According to IAEA's Information Circular No INFCIRC/754/Add.12, there are 31 civilian nuclear facilities under IAEA Safeguards. Furthermore, some civilian unsafeguarded nuclear facilities are not under IAEA Safeguards particularly because of either their importance for strategic purposes or domestic fuel cycle being used in those facilities. For instance, Kudankulam Atomic Power Station (Units 1 & 2) are under IAEA safeguards as they are of Russian origin, further Units 3 and 4 remain unsafeguarded. Similarly, Madras Atomic Power Station (MAPS) and its Units 1 and 2 are not under IAEA safeguards despite these being civilian nuclear facilities. Also, the Kalpakkam Prototype Fast Breeder Reactor (Kalpakkam) remains outside IAEA safeguards because of its plutonium generation is reported to be used for Indian nuclear weapons

²⁵ M V RaMaNa, "The Indian Nuclear Industry: Status and Prospects," *The Centre for International Governance Innovation* 1 (2009).

²⁶ Department Of Atomic Energy India, "Witnesses the Historic 'Commencement of Core Loading' at India's First Indigenous Fast Breeder Reactor (500 MWe) at Kalpakkam, Tamil Nadu," accessed July 25, 2024.

Assessment of India's Nuclear Security Architecture

program. The following are the 31 civilian nuclear facilities under IAEA safeguards:²⁷

Ser No	Facility Name
1	Uranium Oxide Plant, Nuclear Fuel Complex, Hyderabad
2	Ceramic Fuel Fabrication Plant (Pelletizing), Nuclear Fuel Complex, Hyderabad
3	Ceramic Fuel Fabrication Plant (Assembly), Nuclear Fuel Complex, Hyderabad
4	Enriched Uranium Oxide Plant, Nuclear Fuel Complex, Hyderabad
5	Enriched Fuel Fabrication Plant, Nuclear Fuel Complex, Hyderabad
6	Gadolinia Facility, Nuclear Fuel Complex, Hyderabad
7	TAPS 1 – Tarapur Atomic Power Station, Unit 1
8	TAPS 2 – Tarapur Atomic Power Station, Unit 2
9	RAPS 1 – Rajasthan Atomic Power Station, Unit 1
10	RAPS 2 – Rajasthan Atomic Power Station, Unit 2
11	KK 1 – Kudankulam NPP, Unit 1
12	KK 2 – Kudankulam NPP, Unit 2
13	RAPS 5 – Rajasthan Atomic Power Station, Unit 5
14	RAPS 6 – Rajasthan Atomic Power Station, Unit 6
15	RAPS 3 – Rajasthan Atomic Power Station, Unit 3
16	RAPS 4 – Rajasthan Atomic Power Station, Unit 4
17	KAPS 1 – Kakrapar Atomic Power Station, Unit 1
18	KAPS 2 – Kakrapar Atomic Power Station, Unit 2
19	Away from Reactor (AFR) Fuel Storage Facility, Tarapur
20	Nuclear Material Store at Tarapur
21	NAPS 1 – Narora Atomic Power Station, Unit 1
22	NAPS 2 – Narora Atomic Power Station, Unit 2
23	KAPS 3 – Kakrapar Atomic Power Station, Unit 3
24	KAPS 4 – Kakrapar Atomic Power Station, Unit 4
25	KK 3 – Kudankulam NPP, Unit 3
26	KK 4 – Kudankulam NPP, Unit 4
27	RAPS 7 – Rajasthan Atomic Power Station, Unit 7
28	RAPS 8 – Rajasthan Atomic Power Station, Unit 8
29	PHWR Fuel Fabrication Facility (PFFF) NFC – Kota, Rajasthan
30	KK 5 – Kudankulam NPP, Unit 5
31	KK 6 – Kudankulam NPP, Unit 6

²⁷ IAEA Database “Infcirc754a12,” accessed July 25, 2024, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2009/infcirc754a12.pdf>.

Following are the unsafeguarded civilian facilities that are not under IAEA Safeguards.²⁸

Ser No	Facility Name	Safeguards Status	Type	Location	Description
1	Dhruva Reactor ²⁹	Unsafeguarded	Research Reactor	Trombay, Maharashtra	Used for plutonium production and civil research, not under IAEA safeguards. ³⁰
2	Madras Atomic Power Station (MAPS)	Unsafeguarded	Pressurized Heavy Water Reactor	Kalpakkam, Tamil Nadu	Civil nuclear power reactor units 1 and 2 are not under IAEA safeguards.
3	Kaiga Atomic Power Station (KAPS)	Unsafeguarded	Pressurized Heavy Water Reactor	Kaiga, Karnataka	Civil nuclear power reactors, units 1-4, remain unsafeguarded.
4	Fast Breeder Test	Unsafeguarded	Fast Breeder Reactor	Kalpakkam, Tamil Nadu	Experimental fast breeder reactor,

²⁸ Data collected from different sources by the author.

²⁹ "Nuclear Power in India - World Nuclear Association," accessed July 25, 2024, <https://world-nuclear.org/information-library/country-profiles/countries-g-n/india#research-and-development>.

³⁰ "India - International Panel on Fissile Materials," IPFM, accessed July 25, 2024, <https://fissilematerials.org/countries/india.html>.

	Reactor (FBTR)				outside IAEA safeguards.
5	Prototype Fast Breeder Reactor (PFBR)	Unsafe-guarded	Fast Breeder Reactor	Kalpakkam, Tamil Nadu	Under construction, designed for plutonium breeding, not under IAEA safeguards.
6	Tarapur Atomic Power Station (TAPS) 3 & 4	Unsafe-guarded	Boiling Water Reactor	Tarapur, Maharashtra	Units 3 & 4 of Tarapur are not under IAEA safeguards.

C. Cyber Attacks on Indian Nuclear Facilities

In the rapidly changing world, there is an increased risk of cyber-attacks on nuclear facilities that could be used in conjunction with sabotage as well as theft of nuclear material from a facility. Indian nuclear facilities have been targets of cyber-attacks in the past as well. For instance, in 2019, Indian Kudankulam NPP was attacked by a ‘D-Track’ malware carried out by North Korean hackers.³¹ Around the same timeline, the NPCIL’s network was breached that highlights the vulnerabilities of Indian nuclear infrastructure.³²

In order to carry out a cyber-attack, the hackers require only partial control of inner network. This means that the targeted Indian NPPs have a number of security issues, such as rudimentary cyber hygiene policy, weak network security policies, weak password policies and lack of traffic

³¹ “What Is DTrack: North Korean Virus Being Used to Hack ATMs to Nuclear Power Plant in India,” *India Today*, October 30, 2019.

³² Debak Das et al., “Analysis | An Indian Nuclear Power Plant Suffered a Cyberattack. Here’s What You Need to Know.,” *Washington Post*, November 4, 2019.

monitoring. Such cyber-attacks in India have renewed potential for insider threat in Indian NPPs.³³ The reason provided for the denial of the attack due to stand alone network portrays flaws in the Indian cyber security where physical separation from global network or “air-gapping” is deemed enough as a protective measure.

D. Issues Regarding International Cooperation

In the past, the issues related to domestic legal frameworks have raised concerns among states conducting nuclear trade vis-à-vis nuclear deals with India.³⁴ For instance, the Civil Liability for Nuclear Damage Act 2010 was a major hurdle where the liability of nuclear accidents was placed on the foreign nuclear suppliers including the Indo-US civil nuclear deal in 2008.³⁵ International companies like Électricité de France and Japanese company Toshiba (Owner of Westinghouse) have showed concerns for Indian domestic nuclear liability regime.³⁶ Furthermore, International nuclear suppliers have raised concerns regarding public protests against NPPs built in India. These include protests in Kudankulam, Huripur and Kovvada among others regarding nuclear safety and security issues and fears of displacement.

³³ “What Is Cyber Hygiene and Why Is It Important?” Search Security, accessed July 25, 2024, <https://www.techtarget.com/searchsecurity/definition/cyber-hygiene>.

³⁴ “Completing the U.S.-India Civil Nuclear Agreement: Fulfilling the Promises of a Summer Long Past,” Carnegie Endowment for International Peace, accessed July 25, 2024.

³⁵ “Operationalizing India-U.S. Civil Nuclear Cooperation,” *Brookings*, accessed July 25, 2024, <https://www.brookings.edu/articles/operationalizing-india-u-s-civil-nuclear-cooperation/>.

³⁶ “Jaitapur Nuclear Power Plant for India: What You Should Know - ExamArc,” April 26, 2023, <https://guide.examarc.com/upsc/jaitapur-nuclear-power-plant-for-india-what-you-should-know/>.

Assessment and Recommendations

1. Domestic Regulatory Gaps

Because of secrecy revolving around Indian nuclear security, it is difficult to give an independent assessment of nuclear security in India.³⁷ Nevertheless, the recurrent uranium thefts in India show that apart from the fourth tier of rapid response to theft, India lags in deterring, detecting and delaying unauthorized access or theft. For instance, the domestic theft and trafficking of nuclear material indicates the lack of coordination among the stakeholders involved in nuclear security forces. These include law enforcement agencies, intelligence agencies and security force under nuclear regulatory authorities.

India needs to make the AERB independent and autonomous in order to standardize nuclear security architecture. It will help AERB to regulate nuclear issues rather than a subordinate office which is delegated functions and roles by the Central Government.³⁸ Moreover, the analysis of Indian nuclear security reflects that there is an absence of a centralized governing nuclear security apparatus of law enforcement in India and also within the Central Industrial Security. For instance, the security force includes members from many organizations which may not necessarily give the same importance to nuclear security.³⁹

2. Insider Threats

The involvement and links of scientists and workers at nuclear facilities in nuclear thefts indicates that training regarding nuclear security including rules and regulations to ensure the reliability of personnel involved at nuclear

³⁷ Gurmeet Kanwal, "Safety and Security of India's N-Weapons," IDSA, accessed July 27, 2024, https://ciaotest.cc.columbia.edu/olj/sa/sa_apr01kag01.html.

³⁸ "Why India's Nuclear Security Challenge Demands Attention," orfonline.org, accessed July 27, 2024, <https://www.orfonline.org/english/research/42286-why-india-nuclear-security-challenge-demands-attention>.

³⁹ "Why India's Nuclear Security Challenge Demands Attention."

facilities are below average.⁴⁰ India needs to continuously evolve and modernize its nuclear security culture according to changing nuclear risks. There is a need for recurrent training programs for employees from all levels.⁴¹ India needs to assess gaps in its nuclear security framework, particularly in protocols preventing unauthorized access to nuclear material.⁴² There is also a need to counter such vulnerabilities by enhancing its control and accounting of nuclear material.

3. Physical Protection, Storage and Transportation

Indian nuclear theft incidents also indicate gaps between physical protection, storage and transportation. Due to expansion of Indian nuclear facilities across Indian remote areas, it is challenging for India to monitor or secure them. These remote areas also have instabilities like insurgencies and militant groups.⁴³ For Instance, the Kaiga Atomic Power Station located in Karnataka is an unsafeguarded nuclear facility which is in proximity to the Naxalite-Maoist insurgency.⁴⁴ Such close proximity of insurgent groups to these critical nuclear facilities increases their security vulnerabilities, thereby, turning such facilities more prone to sabotage and theft of nuclear material into anti-state militant groups.⁴⁵

⁴⁰ “Lapses in Indian Nuclear Security Mechanism and Its Broader Implications - PolicyEast.”

⁴¹ Rahat Iqbal, “Evaluating Nuclear Security in India,” *Centre for Strategic and Contemporary Research* (blog), October 5, 2022.

⁴² Muhammad Zubair et al., “Nuclear Safeguards: Technology, Challenges, and Future Perspectives,” *Alexandria Engineering Journal* 108: 188–205, <https://doi.org/10.1016/j.aej.2024.07.055>.

⁴³ Michael Kugelman, “The ‘Gravest Threat’ to Internal Security: India’s Maoist Insurgency,” Wilson Center, accessed July 30, 2024.

⁴⁴ Muhammad Jawad Hashmi and Dr. Ashfaq Ahmed, “Threats of Nuclear Terrorism in India: A Case Study of Naxalites,” *Journal of Global Peace and Security Studies* 3, no. 1 (2022).

⁴⁵ Muhammad Jawad Hashmi and Dr. Ashfaq Ahmed.

4. Indian Nuclear Black Market

In 2011, research into potential Indian black market indicated that India had been a customer of international black market.⁴⁶ In 2007, the IISS Dossier⁴⁷ on nuclear black market also indicated that India's BARC, DAE and NPCIL and Indian Rare Earths Ltd (IRE) have been involved in procurement and/or facilitation of nuclear material such recurrent incidents indicate linkages of insiders as well as non-state actors with the global black market are still a challenge to global nuclear non-proliferation efforts. Access to such nuclear material can have broader implications where non-state actors can use these materials for malicious activities.

5. Access to Non-State Actors and making of a Dirty Bomb

A smaller nuclear weapon may require at least 15 kgs of Highly Enriched Uranium (HEU).⁴⁸ Terrorists and non-state actors may not have the knowhow, expertise and facilities to build a nuclear bomb.⁴⁹ Alternatively, such individuals with malicious intent including non-state actors could use a radioactive material for making Radiological Dispersal Device (RDD) or dirty bombs.⁵⁰ The RDDs do not necessarily require technical expertise or certain types of nuclear material. Moreover, the non-state actors could sell such

⁴⁶ Matthew Bunn and William C. Potter, "Introduction: The Problem of Black-Market Nuclear Technology Networks," in *Preventing Black-Market Trade in Nuclear Technology*, ed. Matthew Bunn et al., 1st ed. (Cambridge University Press, 2018), 1–22.

⁴⁷ "Nuclear Black Markets: Pakistan, A.Q. Khan and the Rise of Proliferation Networks (A Net Assessment) (An IISS Strategic Dossier) - The International Institute for Strategic Studies: 9780860792017 - AbeBooks," accessed July 27, 2024, <https://www.abebooks.com/9780860792017/Nuclear-Black-Markets-Pakistan-A.Q-0860792013/plp>.

⁴⁸ B. L. Metcalf and I. W. Donald, "25 - Management of Radioactive Waste (RAW) from Nuclear Weapons Programmes," in *Radioactive Waste Management and Contaminated Site Clean-Up*, ed. William E. Lee, Michael I. Ojovan, and Carol M. Jantzen, Woodhead Publishing Series in Energy (Woodhead Publishing, 2013), 775–800.

⁴⁹ Christoph Wirz and Emmanuel Egger, "Use of Nuclear and Radiological Weapons by Terrorists?" *International Review of the Red Cross* 87, no. 859 (September 2005): 497–510.

⁵⁰ Wirz and Egger.

material to other states which may wish to acquire such material for military purposes. Hence, it is important for India to take all the necessary measures to secure its nuclear material and facilities.⁵¹

6. *Enhancing Cyber Security*

Regarding cyber security of nuclear material and facilities in India, concerned organizations need to have a relook on complete cycle of cyber security of NPPs.⁵² This can start from vendor/software selection and going down to minor issues like access control and data copyrights etc. Moreover, there is a need to augment and review Indian cyber security culture regarding nuclear facilities and material through enhancing and updating cybersecurity protocols.⁵³ There is also a need for implementation of robust encryption and intrusion detection systems in nuclear facilities. India can enhance protocols to follow the record of cybersecurity breaches by involving international players while investing in regular cybersecurity audits and training.⁵⁴

If India does not cater for or prevent such nuclear security incidents from happening by taking necessary measures, the international community may devise a strategy to put brackets on nuclear cooperation with India until India places stringent implementation measures regarding nuclear security of its nuclear material and facilities. There is a dire need for increased oversight into all of Indian civilian nuclear facilities. India may consider offering all of its current and future nuclear facilities under IAEA safeguards.⁵⁵

Moreover, the states which have signed nuclear deals with India could halt their nuclear cooperation and demand investigation into past incidents and enforce nuclear security implementation mechanism in India as a quid pro quo

⁵¹ Wirz and Egger.

⁵² “Ensuring Cyber Security in India’s Nuclear Systems,” orfonline.org, accessed July 27, 2024, <https://www.orfonline.org/research/ensuring-cyber-security-in-indias-nuclear-systems>.

⁵³ “Ensuring Cyber Security in India’s Nuclear Systems.”

⁵⁴ Ibid.

⁵⁵ “Lapses in Indian Nuclear Security Mechanism and Its Broader Implications - PolicyEast.”

to restart nuclear cooperation. One of the reasons India was not able to secure its membership in Nuclear Suppliers Group (NSG) is also its inadequate nuclear security infrastructure.⁵⁶ Hence, Indian uranium security lapses call into question India's credentials as well as readiness for further integration into the global nuclear governance through export control cartels including the NSG until it improves its nuclear security architecture and implementation.⁵⁷

Lack of International Pressure

The geopolitical environment of the 21st century offers India a unique and favorable position, particularly in the context of the evolving dynamics between major global powers.⁵⁸ With the United States engaged in strategic competition with China, India's role as a potential counterbalance in the Indo-Pacific region has gained unprecedented prominence.⁵⁹ This strategic alignment has created a confluence of interests between India and the United States, albeit with limitations and divergences in specific areas.⁶⁰ Nevertheless, this alignment has indirectly shielded India from international scrutiny on sensitive issues, including concerns such as uranium theft and its potential implications for nuclear security.⁶¹ The United States' Indo-Pacific strategy is centered on curbing China's growing influence in the region.⁶²

⁵⁶ "Will India and Pakistan Ever Join the Nuclear Suppliers Group? | Arms Control Association," accessed July 27, 2024.

⁵⁷ "Will India and Pakistan Ever Join the Nuclear Suppliers Group? | Arms Control Association."

⁵⁸ Vinay Kaura, "India's Emerging Geopolitics," in *The Palgrave Handbook of Contemporary Geopolitics*, ed. Zak Cope (Cham: Springer Nature Switzerland, 2024), 1–19.

⁵⁹ Kaura.

⁶⁰ Marko Juutinen, "Emerging Powers and New Global Politics? An Indian Perspective on the BRICS Paradox," *Third World Thematics: A TWQ Journal* 4, no. 6 (November 2, 2019): 489–506.

⁶¹ Juutinen.

⁶² C. Vinodan and Anju Lis Kurian, "Strategic Autonomy and India's Hedging Policies in the Indo-Pacific," *Journal of Asian Security and International Affairs* 11, no. 4 (2024): 475–95, <https://doi.org/10.1177/23477970241282095>.

India, with its significant geographic and strategic advantages, plays a pivotal role in this framework.⁶³

As a member of the Quad (Quadrilateral Security Dialogue) alongside the US, Japan, and Australia, India is viewed as a key player in ensuring a “free and open Indo-Pacific.”⁶⁴ This strategic partnership has resulted in deepening defense cooperation, enhanced military interoperability, and increased political alignment on key regional security issues.⁶⁵ Due to this reason, India’s domestic policies, including those related to human rights and press freedom, have drawn muted criticism from Washington but have not significantly impacted the trajectory of bilateral relations.⁶⁶ This limited alignment and the overriding strategic imperative to counter China have also contributed to an international environment where issues like uranium theft in India do not receive significant attention. Incidents of uranium theft, which pose serious risks to nuclear security, have been reported in India over the years.⁶⁷ However, these cases have largely been downplayed in international forums, reflecting a reluctance among major powers and international institutions to antagonize India. The prevailing view appears to prioritize maintaining strategic partnerships over addressing such critical security concerns.⁶⁸

International institutions tasked with overseeing nuclear security, such as IAEA, have been conspicuously silent on India’s uranium theft incidents.

⁶³ Vinodan and Kurian.

⁶⁴ Kate Sullivan de Estrada, “India and Order Transition in the Indo-Pacific: Resisting the Quad as a ‘Security Community,’” *The Pacific Review* 36, no. 2 (March 4, 2023): 378–405, <https://doi.org/10.1080/09512748.2022.2160792>.

⁶⁵ Sullivan de Estrada.

⁶⁶ Mehmood Hussain and Sumara Mehmood, “Genocide in Kashmir and the United Nations Failure to Invoke Responsibility to Protect (R2P): Causes and Consequences,” *Muslim World Journal of Human Rights* 18, no. 1 (September 1, 2021): 55–77.

⁶⁷ Ghazala Yasmin Jalil, “Issue Brief on ‘India Nuclear Black Market’ | Institute of Strategic Studies Islamabad,” 2024, <https://issi.org.pk/issue-brief-on-india-nuclear-black-market/>.

⁶⁸ Jalil.

This silence can be attributed to the geopolitical calculus of major powers that dominate these institutions. ⁶⁹The US, with its significant influence in international bodies, is unlikely to push for stringent scrutiny of India, given its strategic importance in the Indo-Pacific theater.⁷⁰ Moreover, India's growing economic clout and its position as a rising power provide it with leverage in international diplomacy. Countries and institutions are wary of jeopardizing their relations with India by raising uncomfortable questions, even on matters as critical as nuclear material security.⁷¹

The geopolitical environment has provided India with a shield against significant international criticism, even on issues of global concern like uranium theft.⁷² The strategic priorities of the US and the broader international community, centered on countering China and fostering closer ties with India, have created a permissive environment.⁷³ While this may serve short-term strategic interests, it raises long-term concerns about the potential risks to nuclear security and the credibility of international institutions tasked with ensuring accountability.⁷⁴

Conclusion

Nuclear technology provides tremendous benefits, as it can become catastrophic beyond one state's territory if it gets into wrong hands. While India has taken measures to strengthen its nuclear security architecture both nationally and internationally, significant gaps remain in regulatory framework and implementation and enforcement measures. Moreover, the

⁶⁹ Ibid.

⁷⁰ Manish Dabhade, "Changing Contours of India's Economic Diplomacy," *India Quarterly* 78, no. 2 (June 1, 2022): 334–49, <https://doi.org/10.1177/09749284221091865>.

⁷¹ Dabhade.

⁷² "India's Uranium Theft Crisis and the International Silence," *The Friday Times*, 2024, <https://thefridaytimes.com/26-Sep-2024/the-persistent-crisis-of-uranium-theft-in-india-and-the-international-silence>.

⁷³ "India's Uranium Theft Crisis and the International Silence."

⁷⁴ Ibid.

lack of an independent regulatory body – which has limited resources – coupled with inadequate coordination for nuclear security forces among agencies will continue to pose significant challenges to India’s overall nuclear security. Hence, thefts of at least 200 kgs uranium, cyber-attacks on nuclear facilities for sabotage and unsafeguarded civilian nuclear facilities prone to nuclear security incidents highlights gaps in nuclear security architecture in India. These incidents do not only impact Indian national nuclear security architecture, but also have broader implications on nuclear non-proliferation efforts. Thus, there is a need for states like India to not be complacent regarding nuclear security practices and mitigate such risks. If India fails to do so, the international community will need to put brackets on Indian civil nuclear program and international cooperation until India further enhances its nuclear security through making its regulatory body independent, enhancing nuclear security culture, implementation of nuclear regulations and improving coordination between law enforcement and intelligence gathering agencies. This will help restore international confidence in Indian capabilities to proactively manage its nuclear security responsibilities.

**NATIONAL SECURITY IMPLICATIONS OF
AFRICA'S DEMOGRAPHIC TIMEBOMB IN THE
TWENTY-FIRST CENTURY**

Mercedes F. Scheible

National Security Implications of Africa's Demographic Timebomb in the Twenty-First Century

Mercedes F. Scheible *

Abstract

Africa is undergoing a notable demographic transformation, characterized by a rapidly increasing youth population that holds the capacity to either propel progress or foster instability. In West Africa, the median age is among the lowest in the world, underscoring the dual nature of opportunities and challenges that arise from this trend. Although there is significant potential for economic development and social change, ongoing issues like unemployment, inadequate infrastructure, and restricted political participation pose serious hurdles. This paper explores the central question: How can African governments implement tailored Empowerment, Education, and Employment (3E) policies to address socio-economic challenges, enhance governance, and prevent instability, transforming the continent's youth demographic into a sustainable driver of development? Drawing on the 3E Policy Framework, the study emphasizes the need for strategic interventions, including aligning education systems with labor market demands, fostering youth entrepreneurship, and enhancing political inclusion to strengthen national security. These policies are crucial for turning Africa's demographic shift into a catalyst for sustainable development and long-term stability and for ensuring national security.

Keywords: Unemployment, Policy Reform, Youthquake, Violent Extremism, Socio-Economic Challenges, Youth Empowerment, Political Inclusion

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Introduction

Africa's Demographic landscape has experienced a drastic change during recent years with an unprecedented rise in the youth population. At current times over 60% of Africa is under the age of 25 which makes it one of the youngest demographics around the globe. This youth-oriented populace is predicted to represent as much as 42% of the global populace by 2030. The transitioning demographic shift is offering both opportunities and challenges for the continent. In particular, western Africa stands out, with a median age of around 18 years, which makes it one of the youngest regions of the world. States including Niger, Mali, and Burkina Faso feature some of the highest fertility rates, further contributing to this immense growth.¹³⁷ Opportunities for a “youth dividend” –the idea that a large youthful workforce could catalyze economic growth and innovation- are substantial. Yet, this bright future relies on the African governments' ability to utilize their demographic dividend while addressing socio-economic pressures, such as youth unemployment, limited educational resources, and infrastructure deficits.¹³⁸

The national security of a state is not just limited to traditional security. It includes traditional and non-traditional security threats.¹³⁹ The lack of effective governance weakens the social contract between people and state. Extremist groups can utilize this to enhance their power and can also reduce the effectiveness of the state institutions.¹⁴⁰ This reduces the government

¹³⁷ World Bank Group, “Fertility Rate, Total (Births Per Woman)” (n. D.), <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN>.

¹³⁸ Emmanuel Akwetey, “Youth and Political Development: Deploying Youth Capacities, Confronting the Challenge”, *Institute for Democratic Governance (Ideg)* (2006), <https://archive.uneca.org/sites/default/files/uploaded-documents/ADF/ADF5/issuepaper.pdf>.

¹³⁹ Anthony J. Masys, “Non-Traditional Security: A Risk-Centric View,” in *Handbook of Security Science*, ed. Anthony J. Masys (Cham: Springer International Publishing, 2022), 459–74, https://doi.org/10.1007/978-3-319-91875-4_54.

¹⁴⁰ Margaret White, “Violent Extremism and the Social Contract Theory,” *Police Chief Magazine* (blog), July 21, 2022, <https://www.policechiefmagazine.org/violent-extremism-and-the-social-contract-theory/>.

ability to ensure security, which further deteriorates economic situation and its ability to deliver. As a result, the social contract between people and state further loses its strength.¹⁴¹ Therefore, it is imperative for the state to implement 3E model to reduce the risk to national security.

Edward Paice notes in his book *Youthquake: Why African Demography Should Matter to the World* that a growing youth population alone is not enough to secure development. The continent's future hinges on our ability to invest strategically in education, skills development, and governance systems that effectively capture this demographic. Failing to address these could result in mounting frustrations among youth, who feel excluded from economic possibilities and political decision-making processes.¹⁴²

The Sahel, where many young people face limited economic prospects, has been targeted by extremist groups that exploit the lack of opportunities to recruit disenfranchised youth. The emergence of these factions demonstrates the potential dangers if governments and international organizations fail to respond adequately to the needs of this population. Conversely, African youth are leading voices in challenging the status quo – through social movements, asking for more space at the governance table and a larger slice of political and economic opportunity. Africa's future is in youth empowerment, investment in education, job creation, and good governance.

Moreover, African countries can turn their youth bulge into a driver of economic growth and societal development; however, without specific measures to address these, the continent risks losing a potentially powerful

¹⁴¹ Ibid.

¹⁴² Martin Mulligan, "Youthquake: Why African Demography Should Matter to the World". *The Round Table*, (2022): 111 (5), 647–649. <https://doi.org/10.1080/00358533.2022.2130628>.

demographic dividend.¹⁴³ While scholars like Paice and organizations such as the United Nations Development Program (UNDP) have examined Africa’s demographic potential, there remains a lack of actionable frameworks to guide governments in realizing this opportunity. This study addresses this gap by applying the World Economic Forum’s 3E Policy Framework – Empower, Educate, and Employ, as a lens to evaluate how African governments can transform the challenges posed by their youth demographic into sustainable growth and stability.¹⁴⁴ This paper addresses the central research question: *How can African governments implement tailored Empowerment, Education, and Employment (3E) policies to address socio-economic challenges, enhance governance, and prevent instability, extremism, transforming the continent’s youth demographic into a sustainable driver of development?*

This study employs a qualitative research methodology, relying on an in-depth analysis of secondary data from policy reports, academic literature, and statistical datasets. Sources include reports from the UNDP, World Bank, and Afrobarometer surveys, as well as peer-reviewed studies. The research focuses on three interconnected pillars: Empowerment, which examines how expanding rights and reducing marginalization can promote equity and inclusion; Education, which evaluates reforms to align curricula with labor market demands; and Employment, which investigates strategies to foster entrepreneurship and create jobs in high-growth sectors such as technology and renewable energy. While this reliance on secondary data limits insights

¹⁴³ Leigh Mayhew et al., “The intersection between socioeconomic conditions and youth radicalization - Implications for programming in the G5 Sahel countries” (2022), Rome, FAO, <https://doi.org/10.4060/cb8658en>.

¹⁴⁴ World Economic Forum, “A 3E Policy Framework to Reap the Demographic Dividend: Empower, Educate, Employ” (n.D.), <https://esaro.unfpa.org/sites/default/files/pub-pdf/The%203Es%20policy%20framework%20to%20reap%20the%20demographic%20dividend%20Empower%20employ%20educate.pdf>.

into localized contexts, it provides a structured analysis of broader trends and actionable policy recommendations.

The “Youthquake”

“Youthquake” is a demographic shift of influence – Deploying the potential in young people on African socio-political and economic structures. It underlines their growing desire for active participation in governance and decision-making processes. African youth, driven by a demand for reform and high ambitions, are becoming increasingly vocal and active in shaping their nations’ features. The Ghanaian “DumsorMustStop” campaign, initiated by actress Yvonne Nelson to protest frequent power outages and the youth-led protests in Kenya against the Finance Bill 2024, illustrates the growing impact of African youth on national dialogues. Both movements underline the role of youth in advocating for improved governance and infrastructure while exposing systematic deficiencies within state institutions and governance.¹⁴⁵

Across the continent, leaders of tomorrow are channeling accountability towards increasing outdated political systems through youth activism. In Sudan, it was primarily young people who spearheaded the movement that eventually led to the ousting of longtime ruler Omar al-Bashir, showcasing the critical role of youth in driving political change. In Senegal, young activists are mobilizing for reforms to improve governance, pressing leaders to meet their demands for transparency and justice. Similarly, in the Gambia, young citizens took to the streets of Banjul in July 2024, protesting economic policies that disproportionately benefit the privileged, demanding the

¹⁴⁵ Benjamin Ezugwu Onodi, “Youthquake and Public Accountability of Emerging Leadership In Developing Economy”, *Department Of Accounting, College Of Management Sciences, Michael Okpara University Of Agriculture* (n. D.), <https://cnaj.anan.org.ng/downloads/15edf52e5483f22999fdb6d1d3d11c8.pdf>.

government to take action to address inequality.¹⁴⁶ These examples demonstrate how youth across the continent are emerging as powerful forces, unafraid to challenge the status quo and push for deeper reforms that could reshape their future.

This youth-driven movement represents both significant opportunities and considerable challenges. On one hand, the youthful population represents immense economic growth and innovation potential. African youth have already shown their entrepreneurial spirit and technological capabilities in multiple sectors ranging from technological startups and creative industries to agriculture.¹⁴⁷ The swift growth in the youthful population brings to light significant challenges in governance, infrastructure, and the availability of employment. In nations like Ghana and Burkina Faso, where unemployment rates stand at about 3.08% and 5.29%, respectively,¹⁴⁸ the pressure on governments to tackle these issues is intensifying. Addressing the need for job creation, education, and public services becomes paramount in meeting the demands of this fast-growing population.¹⁴⁹

In *Youthquake: Why African Demography Should Matter to the World*, Edward Paice delves into the complexity of Africa’s demographic changes, questioning the widespread belief in “demographic determinism” — the idea that a large, young population will inevitably lead to economic prosperity. He highlights that Africa’s situation is far more nuanced than this simplistic view

¹⁴⁶ Ebrima Faal, “Youth and women are shaping Africa’s future”, *London School of Economics and Political Science*, <https://blogs.lse.ac.uk/africaatlse/2024/10/03/youth-and-women-are-shaping-africas-future/>.

¹⁴⁷ Cristiano Volpi, “The Youthquake in Africa: A Continent on the Rise”. *Africa24.it* (2024), <https://africa24.it/en/2024/06/05/the-youthquake-in-africa-a-continent-on-the-rise/>.

¹⁴⁸ Benjamin Ezugwu Onodi, “Youthquake and Public Accountability of Emerging Leadership in Developing Economy”, *Department Of Accounting, College Of Management Sciences, Michael Okpara University Of Agriculture* (n. D.), <https://cnaj.anan.org.ng/downloads/15edf52e5483f22999fdb6d1d3d11c8.pdf>.

¹⁴⁹ “Unemployment rate,” *Central Intelligence Agency* (n. D.) <https://www.cia.gov/the-world-factbook/field/unemployment-rate/country-comparison/>.

suggests. Paice argues that the continent's varying demographic and socio-political environments make it impossible to apply one-size-fits-all explanations. The link between population growth and economic outcomes is far from uniform across Africa. Thus, recognizing the intricacy of these demographic shifts is crucial; it is not simply population size that leads to success, but the systems and policies that can channel that potential effectively. Paice also warns against relying on outdated or externally driven narratives that fail to capture Africa's diverse and dynamic realities. Therefore, fostering a deeper, more contextual understanding of these demographic trends is essential, focusing on creating systems that can harness the full potential of Africa's youth.¹⁵⁰

Youth Ambition vs. State Capacity and National Security Implications

According to a 2021 Afrobarometer survey, the aspirations of Africa's youth are immensely shaped by priorities such as employment, health, education, and infrastructure. Despite a clear awareness of these needs, African youth frequently encounter substantial obstacles in realizing their ambitions. The unemployment rate among youth is significantly higher compared to older age groups, reflecting a gap in employment opportunities and economic integration.¹⁵¹ Moreover, the lower levels of political engagement and voter participation among young people often result in their needs being

¹⁵⁰ Martin Mulligan, "Youthquake: Why African Demography Should Matter to the World", *The Round Table*, (2022): 111 (5), 647–649. <https://doi.org/10.1080/00358533.2022.2130628>.

¹⁵¹ Gildfred Boateng Asiamah et al., "Africans say governments aren't doing enough to help youth", *Civil Society Organisations African Governance Platform Project* (2021), <https://africanlii.org/akn/gh/doc/briefing-paper/2021-11-03/africans-say-governments-arent-doing-enough-to-help-youth/eng@2021-11-03/source.pdf>.

inadequately addressed by existing policies.¹⁵² This disconnection showcases the necessity for enhanced youth participation in policy-making processes to align governmental actions more closely with the aspirations of the younger population.¹⁵³

African governments face significant challenges in effectively addressing the ambitions of their youth populations. Despite acknowledging youth-related issues as critical societal problems, many states struggle with engaging youth directly in governance and decision-making.¹⁵⁴ According to Afrobarometer, a considerable portion of youth perceive their governments as failing to adequately address pressing issues such as job creation and educational reform.¹⁵⁵ The limited direct involvement of youth in policy-making processes exacerbates this issue, resulting in a disconnect between youth expectations and government actions. This gap stresses the need for developing more inclusive governance frameworks that actively involve youth in shaping policies that affect their future.¹⁵⁶

Infrastructure and governance issues further complicate the ability of states to meet the ambitions of their youth. Institutional weaknesses and ineffective policy implementation hinder progress in addressing youth needs. South Africa had previously taken steps to engage the youth in the development of a “youth policy,” which aimed to expand education opportunities and promote better economic participation among the younger

¹⁵² Emmanuel Akwetey, “Youth and Political Development: Deploying Youth Capacities, Confronting the Challenge”, *Institute for Democratic Governance (IDEG)* (2006), <https://archive.uneca.org/sites/default/files/uploaded-documents/ADF/ADF5/issuepaper.pdf>.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ Gildfred Boateng Asiamah et al., “Africans say governments aren’t doing enough to help youth”, Civil Society Organisations African Governance Platform Project (2021), <https://africanlii.org/akn/gh/doc/briefing-paper/2021-11-03/africans-say-governments-arent-doing-enough-to-help-youth/eng@2021-11-03/source.pdf>.

¹⁵⁶ Ibid.

population. Despite setting ambitious targets, the country faced challenges due to poor implementation at local levels. The lack of genuine youth participation in policy development often leads to ineffective or misaligned policies. This fragmentation and the predominance of government-led initiatives showcase the need for more inclusive and effective governance structures to address gaps in infrastructure and policy implementation.¹⁵⁷

This gap in governance model can be exploited by the non-state actors and state actors. It has the potential to create political instability, economic insecurity, food insecurity, and less opportunities for youth. Non-state actors can easily exploit this for their own gains. They can easily recruit unemployed youth to their organization.

Leadership and Security Challenges

Leadership failures across many African countries have notably contributed to youth frustration. A significant portion of the youth perceive that their governments have been ineffective in addressing critical needs, particularly in employment and education. This perception of inadequate leadership has led to increasing demands for alternative forms of governance as youth seek more responsive and inclusive leadership. The growing discontent reflects a broader dissatisfaction with the existing political framework and highlights the need for leadership that more effectively addresses the concerns of the youth.¹⁵⁸ The response to perceived leadership failures has, in some instances, manifested in violent extremism and unrest. A bigger challenge is that violent extremist groups understand young people better than the state in many parts of the

¹⁵⁷ Ibid.

¹⁵⁸ Gildfred Boateng Asiamah et al., "Africans say governments aren't doing enough to help youth", *Civil Society Organisations African Governance Platform Project* (2021), <https://africanlii.org/akn/gh/doc/briefing-paper/2021-11-03/africans-say-governments-arent-doing-enough-to-help-youth/eng@2021-11-03/source.pdf>.

Sahel. This allows them to mobilize, exploit, and weaponize the pervasive grievances of the youth for recruitment and attacks.¹⁵⁹

In many cases, violent extremist groups recognize the underlying frustrations that government institutions either fail to address or inadvertently exacerbate. These groups position themselves as alternative sources of empowerment by capitalizing on grievances related to unemployment, corruption, and political exclusion. This is especially dominant in regions with weak or absent state governance. The failure to deliver on basic needs, such as access to education and employment, leaves young people feeling neglected. Violent extremist organizations often provide the illusion of empowerment, framing their cause as a solution to systematic neglect, which appeals to disaffected youth seeking a sense of belonging and purpose.¹⁶⁰

A study by the UNDP *Journey to Extremism I and II* highlights the extreme challenges and conditions young people face on the continent. The study uncovers that instead of support, many governments are in the way of young people, creating obstacles that undermine youth's capacity to flourish, pushing millions into poverty, drugs, and crime. This reality has a proclivity to accelerate youth recruitment into violent extremist groups.¹⁶¹ Historical examples, such as the Arab Spring and recent crises in the Sahel, illustrate how youth frustrations with ineffective leadership can lead to increased political and security challenges. These cases demonstrate the consequence of

¹⁵⁹ Alcinda Manuel Honwana, "Youth Struggles: From the Arab Spring to Black Lives Matter & Beyond", *African Studies Review* (2019): 62(1), 8–21. <https://doi.org/10.1017/asr.2018.144>.

¹⁶⁰ Araştırma Makalesi, "The Rising Trends of Violent Extremism in West Africa: A Threat to Regional Security", *Uluslararası İlişkiler Çalışmaları Dergisi* (2022): 2(2), 111-131. <https://dergipark.org.tr/en/download/article-file/2565010>.

¹⁶¹ United Nations Development Programme, "Journey to Extremism in Africa" (2023), https://www.undp.org/sites/g/files/zskgke326/files/2023-02/JOURNEY%20TO%20EXTREMISM%20IN%20AFRICA%20PATHWAYS%20TO%20RECRUITMENT%20AND%20DISENGAGEMENT_2023.pdf.

leadership failures, stressing the importance of addressing youth grievances to prevent unrest.¹⁶²

Socio-economic deprivation is the primary condition that makes violent extremist groups like Boko Haram thrive in northern Nigeria, with high levels of poverty and youth unemployment combined with political disenfranchisement. Despite Nigeria's wealth in natural resources, the region's widespread poverty contributes to a fertile ground for radicalization. This is exacerbated by the scarcity of economic opportunities, particularly for young people, youth unemployment, and high levels of perceived corruption among government officials - creating an atmosphere ripe for social unrest. Extremist groups exploit these conditions, positioning themselves as an alternative to the state that promises action and change where the government is perceived to have failed. While Ghana is not yet on the same scale of violent extremism compared to that of its neighboring countries, many of the underlying factors that fuel extremism is present. Youth unemployment, poverty, social inequalities, and corruption persist in various country regions. These issues, if not addressed, create an enabling environment for extremist ideologies to take root. While Ghana has so far avoided large-scale Islamist extremism, political vigilantism, chieftaincy conflicts, and ethnic tensions reveal underlying vulnerabilities. Extremist groups operating in neighboring countries could seek to exploit these tensions, particularly as Ghana shares borders with countries facing significant extremist violence and terrorism.¹⁶³

The continued rise of extremist violence in West Africa displays the transnational nature of these security challenges. Extremist groups, not

¹⁶² Alcinda Manuel Honwana, "Youth Struggles: From the Arab Spring to Black Lives Matter & Beyond", *African Studies Review* (2019): 62(1), 8–21, <https://doi.org/10.1017/asr.2018.144>.

¹⁶³ Araştırma Makalesi, "The Rising Trends of Violent Extremism in West Africa: A Threat to Regional Security", *Uluslararası İlişkiler Çalışmaları Dergisi* (2022): 2(2), 111-131. <https://dergipark.org.tr/en/download/article-file/2565010>.

confined by borders, seek to exploit local grievances, requiring regional cooperation and coordinated security responses.¹⁶⁴ Ghana faces a rising threat of violence, particularly given the current deteriorating security situation in neighboring country such as Burkina Faso. Recent incidents, such as the August 2023 attack near Barsalogo in Burkina Faso, have heightened concerns about extremist violence.¹⁶⁵ Addressing these challenges requires a holistic approach that goes beyond military intervention and tackles the root causes of youth frustration.

Economic and Political Struggles

Youth discontent with democratic processes is increasingly prevalent throughout Africa, with many young individuals viewing existing demographic structures as insufficient in meeting their needs, especially concerning critical areas such as employment and education.¹⁶⁶ This growing dissatisfaction highlights the urgent need for democratic reforms that more effectively cater to the aspirations of young citizens. It portrays the limitations of current democratic institutions in fulfilling youth expectations. National youth policies, such as South Africa's National Youth Policy of 1997, have been established to encourage youth engagement in policy-making and democratic development. Nevertheless, many youths remain disenchanted despite these initiatives, often feeling excluded from substantial decision-

¹⁶⁴ Ibid.

¹⁶⁵ David Lewis, "Al Qaeda branch says it killed 300 fighters, not civilians, in Burkina Faso attack", *Reuters* (2024), <https://www.reuters.com/world/africa/al-qaeda-branch-says-it-killed-300-fighters-not-civilians-burkina-faso-attack-2024-08-29/>.

¹⁶⁶ Gildfred Boateng Asiamah et al., "Africans say governments aren't doing enough to help youth", Civil Society Organisations African Governance Platform Project (2021), <https://africanlii.org/akn/gh/doc/briefing-paper/2021-11-03/africans-say-governments-arent-doing-enough-to-help-youth/eng@2021-11-03/source.pdf>.

making processes. This perception of failure exacerbates youth frustrations and impedes overall development and political stability.¹⁶⁷

A significant factor contributing to this disillusionment is the lack of viable opportunities for political engagement. While global advocacy frameworks such as the African Union's Youth Charter aimed to empower young people, they have not fully resonated with African youth.¹⁶⁸ Many young people, especially from higher education backgrounds, tend to gravitate toward market-based solutions rather than relying on political frameworks to solve their challenges. This is evident in the "brain drain" phenomenon, where university graduates and highly skilled youth seek better opportunities abroad, further compounding the challenges of youth unemployment and underemployment within their home countries. For those who remain, the unofficial employment sector has become an alternative pathway to address their needs independently, as public sector opportunities are limited. While a small fraction of highly educated youth finds roles in the public or private sectors where they can influence policy, the scope of their impact is limited. In many cases, these individuals are seen more as representatives of institutional interests than as advocates for their generation.¹⁶⁹

Country-level approaches to youth participation also reveal differences. While in South Africa, civil society organizations have facilitated youth involvement in policy formulation, showing promise for a more inclusive governance model, countries like Sierra Leone and Angola have seen less success with government approaches that often marginalize youth and

¹⁶⁷ Emmanuel Akwetey, "Youth and Political Development: Deploying Youth Capacities, Confronting the Challenge", *Institute for Democratic Governance (IDEG)* (2006), <https://archive.uneca.org/sites/default/files/uploaded-documents/ADF/ADF5/issuepaper.pdf>.

¹⁶⁸ Gedion G. Jalata, "Challenges and Opportunities of Youth in Africa". *The United Nations Economic Commission for Africa* (2014), 12(6), 537–542. <https://www.davidpublisher.com/Public/uploads/Contribute/5518fba0c665.pdf>.

¹⁶⁹ Ibid.

reinforce traditional power dynamics. Ghana's role of controlled participation, while seeking to incorporate youth in public decision-making, has similarly faced challenges in promoting real democratic engagement and addressing youth priorities.¹⁷⁰

The overarching challenge remains in effectively incorporating the perspectives of young individuals into the decisions that shape their economic and social futures. For effective democratic governance to be successful, it is essential that leaders and political entities genuinely commit to public service and remain attentive to the diverse needs of all citizens.¹⁷¹ For democracy to thrive, leadership must prioritize the needs of the people rather than merely seeking power or favorable electoral results.

Policy Recommendations for Youth Empowerment

The dual nature of Africa's demographic, presenting opportunities and challenges, urges governments, regional bodies, and international partners to adopt proactive policies to address social and economic disparities while strengthening economic empowerment, political inclusion, education, and security. The following policy recommendations are designed to align with the 3E framework and provide actionable solutions to transform Africa's youth into sustainable drivers of development.

- **Empower**

1. ***Strengthen Political Participation and Civic Engagement for Youth***

Political inclusion of all societal groups is necessary for long-term stability, as young people feel a greater sense of agency in shaping their future. In this way, they become stakeholders in the system and less likely to become part of the activities which are against national security of state. Therefore,

¹⁷⁰ Ibid.

¹⁷¹ Ibid.

governments need to facilitate opportunities for youth to participate in policy-making, creating a more inclusive governance framework.

- **Establishment of Youth Advisory Councils within Government Structures**

Creating advisory councils at local and national levels offers young people a platform to actively participate in decision-making on issues that directly affect their lives, such as employment, healthcare, and education. These councils provide a formal mechanism to bring youth perspectives into governance, fostering a more inclusive and accountable system that better reflects the needs of younger generations. When participating in these councils, youth can gain first-hand experience in civic processes, which prepares them for future leadership roles. It also encourages a stronger sense of accountability and responsibility among younger demographics in shaping their communities.

- **Introduction of Youth Representation Quotas in Legislative Bodies**

To ensure the adequate representation of youth in legislative structure, governments can implement quota system. In this way, youth will not stay out of decision-making process. Moreover, their presence in legislative bodies will make legislation as well as decision making process inclusive. Adopting this approach will promote an inclusive model of governance and legislation, which will have input of all generations. This will also create opportunities for emerging leaders to create a political landscape which is inclusive. It will also give them hope that they can change their future through political process. They will less likely to adopt an extremist approach to bring change.

2. Develop Community-Based Security and Counter-Extremism Initiatives

Those regions where extremism and terrorism is a challenge, government should provide alternative to youth so that they do not adopt radical ways to bring change. One alternative is the community-based program for security and counter extremism. When communities will be involved in this process then space for terrorist organization is going to decline.

- **Creation of Community Centers Focused on Youth Engagement and Development**

Community centers that offer sports, arts, and skill-building programs provide young people with constructive outlets and a safe space for personal growth. They can play a pivotal role in helping youth develop new skills, form social connections, and share meaningful experiences within their communities. By fostering a sense of belonging and purpose, community centers promote positive engagement and act as a counter to extremist narratives, empowering youth to contribute positively to society.

- **Implementation of Mentorship Programs for Youth in Vulnerable Regions**

The government can also provide mentorship to students in vulnerable regions which are affected by terrorism and extremism. They can provide comprehensive guidance to students related to all domains of their lives. These mentors can provide meaningful advice to youth in matters related to jobs and education. For instance, they can help students in choosing the right career, which aligns with the requirements of future job markets. In this way, they can become useful in ensuring that after education youth population does not become vulnerable to unemployment, which can make them an easy target of terrorist and extremist organizations.

- **Educate**

1. ***Align Educational Systems with Labor Market Demands***

Education plays a critical role in empowering youth. Educated youth can not only transform life of their family but also life of the whole community. To make role of education more effective in transforming the society, it should be aligned with the needs of job market. If education is not aligned with the needs of job market, then educated youth with no job opportunities can be more dangerous and can become an easy target of extremist organizations. Therefore, it is imperative that education aligns with need of job market.

- **Incorporation of Practical and Technical Training within Secondary Education**

There is need to reform the school's curriculum. The government can integrate skill-based education into the curriculum. The government should train student in the fields of artificial intelligence, technology, health care, machine learning, and other relevant fields. Integrating skill-based education in curriculum will not only provide more job opportunities to student but also it is going to have a positive impact on the economic situation of a state. Because availability of skill labor can help a state in increasing its exports, and it can bring revenue which can be invested on development. This approach can strengthen relationship between state and people. Hence, it can become an effective tool against extremism and terrorism.

- **Strengthening of Science, Technology, Engineering, Mathematics (STEM) and Digital Education**

STEM education, along with digital literacy, is becoming increasingly vital in an ever-evolving, technology-driven global landscape. Collaborations between governments and external technology firms can offer youth valuable training in coding, data analysis, and digital skills, positioning young Africans to compete in international markets and preparing them for the future. The

presence of these programs in school curricula, especially in rural areas, will help foster innovation and problem-solving skills at a young age. Thereby, the expansion of access to digital education in rural areas will bridge a digital divide, giving all youth the skills necessary to thrive in the modern workforce. Furthermore, this is likely strengthening the social contract between state and people. As a result, the young population less likely to become part of extremist organization.

2. Establish Sustainable International Partnerships

Considering the scale of challenges confronting African youth, international partnerships are essential for establishing effective knowledge-sharing models and mobilization of resources.

- **Building Long-Term Partnerships with International Organizations (IOs)**

Developing collaborations with organizations, such as the African Union (AU), United Nations (UN), and World Bank, is important for accessing resources, expertise, and an international network. These partnerships should prioritize capacity building within African institutions to empower them to independently implement, manage, and sustain youth programs in the long term. Through workshops, training, and joint research, knowledge-sharing can be strengthened, equipping all parties with best practices and tools tailored to the regional context. Further, ongoing dialogue with IOs can help address emerging challenges by providing access to support systems and networks that align with local development goals.

- **Integration of Strict Monitoring and Evaluation Systems for Accountability and Transparency**

Implementing comprehensive monitoring and evaluation mechanisms is critical to ensure that international funding is effective and aligns with the objectives of youth programs. Such systems should allow for continuous

assessment of program outcomes, identify potential challenges in the early stages, and showcase successful strategies. By optimizing resource allocation, this approach ensures investments are channeled toward initiatives that have demonstrated success and high potential for sustainable impact.

- **Strengthening of Digital Infrastructure and Connectivity**

Reliable digital infrastructure is crucial for empowering youth by facilitating access to education and remote job opportunities. Setting up internet access points within public infrastructure, such as community centers and libraries, can help bridge the digital divide in areas where internet availability is limited. In many regions, a lack of affordable and reliable internet access hinders young people from fully utilizing digital resources. Governments should, therefore, prioritize investments in expanding internet connectivity, particularly in rural areas, to support the inclusion of young people from marginalized communities. By collaborating with tech companies, governments can also build on training opportunities that equip youth with digital skills, covering topics ranging from basic digital literacy to advanced areas like web development and cybersecurity.

- **Employ**

1. ***Increase Accessibility to Employment Opportunities and Support for Youth Entrepreneurship***

Unemployment remains one of the biggest challenges for African youth.¹⁷² Addressing this issue will require job creation initiatives and increased support for entrepreneurial businesses.

¹⁷² Afrobarometer, "Africa's youth are more educated, less employed, and less politically engaged than their elders, Afrobarometer study shows" (2023), https://www.afrobarometer.org/wp-content/uploads/2023/11/News-release_Africas-youth-more-educated-less-employed-less-engaged-Afrobarometer-16Nov2023-.pdf.

- **Expansion of Support for Small and Medium-Sized Enterprises (SMEs)**

SMEs create jobs, especially for young people. Governments can assist SMEs in critical sectors, such as agriculture, energy, and technology, which show high growth potential, by offering incentives such as tax breaks and grants. The support of enterprises in these fields has the potential to create stable job opportunities and contribute positively to the economic ecosystem.

- **Increase of Accessibility to Financial Resources for Youth Entrepreneurs**

A common hindrance for youth starting businesses is the lack of capital. The implementation of loan programs designed for youth, including low-interest rates and accessible terms, will strengthen the overall youth engagement in the economy. Moreover, microfinance initiatives targeted at rural youth can further reduce barriers to entrepreneurship. By connecting youth entrepreneurs with seasoned business professionals through a mentorship program, industry leaders can provide critical guidance and support, enhancing the likelihood of initial business success.

- **Promotion of Youth Innovation in High-Growth Sectors**

Industries, such as technology and green energy, have offered, over the past years, increased opportunities for youth-led innovation. The establishment of innovation hubs, which will grant young people access to resources, necessary equipment, and mentorship, will empower them to bring their ideas to fruition. Furthermore, partnerships with the private sector for internship placements and specialized job training can help facilitate the integration of youth into these sectors, equipping them with essential skills and networks to thrive in the economy.

Conclusion

The youth demographic in Africa represents a pivotal moment for the continent's trajectory. There are significant opportunities for economic advancement, innovation, and social progress. Yet, these opportunities depend on the ability of governments to confront persistent issues such as unemployment, political marginalization, and inadequate infrastructure. Without strategic investments in education, job creation, and substantial political inclusion, there is a growing risk that discontent among the youth will escalate, which could result in heightened instability and the proliferation of extremist groups, especially in vulnerable areas like the Sahel. Moving forward necessitates a collaborative approach from African governments and international allies to prioritize youth involvement. By adopting targeted policy recommendations following the 3E framework, such as expanding educational access, fostering youth engagement in governance, and building an inclusive digital infrastructure, Africa can leverage its demographic shift into a powerful driver of stability and progress, ensuring that its youth play a vital role in shaping the continent's future. This united commitment to change will empower Africa's young generation to drive sustainable development, address socio-economic challenges, and contribute to a more prosperous future for the continent.

ROLE OF DIRECTED ENERGY WEAPONS (DEWs)

IN SHAPING THE FUTURE OF WARFARE

IN SOUTH ASIA

Itfa Khurshid

Role of Directed Energy Weapons (DEWs) in Shaping the Future of Warfare in South Asia

Itfa Khurshid*

Abstract

As modern warfare gradually integrates advanced technology, the advent of cost-effective, user-friendly technologies has altered its landscape. Directed Energy Weapons (DEWs) exemplify this transformation, possessing distinct features that major global powers actively develop for both offensive and defensive purposes. At the regional level, India's prioritization of DEWs development has prompted Pakistan to concentrate on enhancing its capabilities in this domain. The primary research question in this study addresses how states are developing DEWs internationally and in South Asia, along with its potential implications? This study adopts the conceptual framework of a force multiplier, and employs qualitative research methodology. It concludes that DEWs hold significant potential to be leveraged at both operational and strategic levels. These advanced technologies can augment existing defense systems, disrupt command and control infrastructures, and provide critical capabilities for countering drones and missiles with precision. Furthermore, their application in targeted strikes underscores their transformative role in modern warfare. The study emphasizes the importance of Pakistan prioritizing investment in DEWs to enhance its defense architecture and maintain strategic balance.

Key Words: Directed Energy Weapons, High Energy Lasers, High Powered Microwaves, Pakistan, India

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Introduction

Directed Energy Weapons (DEWs)¹ encompass various technologies that utilize electromagnetic energy across different ranges, designed for both offensive and defensive military operations. These technologies include² High-Powered Microwaves (HPM), High-Energy Lasers (HEL), Charged Particle Beams (CPB), Neutral Particle Beams (NPB), among others. DEWs possess distinct characteristics³ that make them highly advantageous in modern warfare scenarios. Following table explains these characteristics in details with description and their profound impact.

Table 1.1 Characteristics of DEWs⁴

<u>Characteristic</u>	<u>Description</u>	<u>Impact</u>
Speed of Light Operation	DEWs operate at the speed of light, ensuring rapid response and precise interception.	Superior tracking and accuracy in targeting.
Stealth-Like Properties	Difficult to detect and intercept, enhancing strategic and tactical advantages.	Ideal for strategic defense and battlefield applications.
Cost-Effectiveness	Provides a high return on investment with	Affordable force multipliers, enhancing military capabilities.

¹ Henry Obering, “Directed Energy Weapons Are Real . . . And Disruptive,” *PRISM* 8, no. 3 (2020): 10. https://ndupress.ndu.edu/Portals/68/Documents/prism/prism_8-3/prism_8-3_Obering_36-46.pdf

² D. Curtis Schleher, *Electronic Warfare in the Information Age* (Boston: Artech House Publishers, 1999).

³ Ibid.

⁴ The table is made by the author based on her understanding of the subject.

Role of Directed Energy Weapons (DEWs) in Shaping the Future of Warfare in South Asia

	relatively low financial outlay.	
Compact Size & Versatility	Easily integrates across various platforms (land, air, sea, space).	Operational flexibility and diverse deployment options.
Simultaneous Target Engagement	Capable of engaging and neutralizing multiple targets at once.	Increased effectiveness in complex and dynamic environments.

These attributes underscore the pivotal role DEWs play in modern military strategy, warranting further research into their optimal deployment and strategic implications. There are several studies which discuss the potential use of DEWs.

The article “Directed Energy Weapons Are Real and Disruptive”⁵ by Henry “Trey” Obering, III explores the growing reality of DEWs including the HELs and HPMs, which are advancing rapidly by examining their key characteristics, potential applications, and disruptive impact, particularly in countering emerging threats like hypersonic weapons. The book, “Effects of Directed Energy Weapons”⁶ by Philip E Neilsen offers an in-depth exploration of how DEWs propagate and interact with targets. The authors Mark Gunzinger and Chris Dougherty in “Changing the game: The Promise of Directed Energy Weapons”⁷ argues that directed energy technologies have

⁵ Henry Obering, “Directed Energy Weapons Are Real . . . And Disruptive,” *PRISM* 8, no. 3 (2020): 10. https://ndupress.ndu.edu/Portals/68/Documents/prism/prism_8-3/prism_8-3_Obering_36-46.pdf.

⁶ Philip E. Neilsen, *Effects of Directed Energy Weapons*, (Washington DC, 1994).

⁷ Mark Gunzinger, Chris Dougherty, “Changing the game: The Promise of Directed Energy Weapons”, *Centre for Strategic and Budgetary Assessments* (2012), https://csbaonline.org/uploads/documents/CSBA_ChangingTheGame_ereader.pdf.

reached a level of maturity where they could offer significant advantages throughout the targeting process, including enhanced defense of forward bases and forces against a wide range of threats.

In the article “War at the Speed of Light: Directed-Energy Weapons and the Future of Twenty-First Century Warfare”⁸, author Louis A. Del Monte discusses how DEWs offer significant advantages to competing nations, especially the United States, Russia, and China. The author Mohit Vashisth argues in his article titled, “Directed Energy Weapons-International research and country specific developments”⁹ that governance mechanism for DEWs is a crucial issue.

Despite extensive studies, a research gap exists regarding the development of DEWs internationally, particularly in the context of South Asia. The study aims to fill this gap by conducting research about DEWs and their potential applications in modern warfare by analysing the role of DEWs in shaping offensive and defensive military strategies. The study emphasizes the development of DEWs in India and how these weapons could potentially be used against Pakistan in various scenarios.

This study is significant for several reasons. First, it offers a South Asian perspective on DEWs while touching upon the DEWs development at global level. Second, it explores how these technologies could impact future conflicts between Pakistan and India. Third, it analyses the strategic options available to Pakistan in response to India’s potential deployment of DEWs, considering various countermeasures.

⁸ Louis A. Del Monte, *Directed-Energy Weapons and the Future of Twenty-First-Century Warfare*. University of Nebraska Press, 2021. <https://doi.org/10.2307/j.ctv1f70mlm>.

⁹ Mohit Vashisth, “Directed Energy Weapons-International research and country specific developments”, *Cescube*, February 21, 2021, <https://www.cescube.com/vp-directed-energy-weapons-international-research-and-country-specific-developments>.

The study adopts qualitative methodology to explore DEWs from various perspectives such as their characteristics, utility in modern warfare and strategic implications. Research is primarily based on secondary sources to analyse and review the strategic environment and use of DEWs in future warfare in South Asia. Case study approach is used to study the current status and advancements in DEWs, especially in countries like India, and analysing how this might influence Pakistan's approach to enhancing its own capabilities.

This paper is divided into several sections; the first section provides a conceptual framework for study, the second section discusses the development of DEWs, and the third section provides detail about the applications of these weapons. The Fourth section provides policy options for Pakistan, and the last section provides the conclusion.

Conceptual Framework

The concept of a force multiplier, defined as, “the effect produced by a capability that, when added to and employed by a combat force, significantly increases the combat potential of that force and thus enhances the probability of successful mission accomplishment, is integral to understanding modern military and strategic operations”.¹⁰ Originating from military operational art, this concept now broadly describes factors that amplify the effectiveness of various endeavors, including security and strategic operations.¹¹

At its core, the force multiplier concept assumes several key principles. First, it enhances the capability of military units, enabling them to perform tasks with greater efficiency and effectiveness. This enhancement could be

¹⁰ John F. Bradford, “Force Multiplier,” *Asian Survey* 62, no. 4 (August 1, 2022): 666–94, doi:10.1525/as.2022.1651914.

¹¹ W. J. Hurley, “A Clarification of the Concepts of Force Multiplier and Returns to Force Scale,” *Defence and Peace Economics* 16, no. 6 (January 1, 2005): 463–65, doi:10.1080/10242690500167817.

through advanced weaponry, superior training, or innovative tactics that boost combat effectiveness.¹² Secondly, technological superiority is a significant force multiplier, providing qualitative advantages that can shift the balance in favor of the force employing them.¹³ For instance, technologies such as precision-guided munitions, cyber capabilities, and intelligence, surveillance, and reconnaissance (ISR) systems dramatically enhance operational effectiveness.¹⁴ Moreover, force multipliers offer greater operational flexibility, allowing forces to adapt and respond to various threats more effectively.¹⁵ Enhanced mobility, advanced communication systems, and improved logistical support enable forces to maneuver efficiently and sustain prolonged operations.¹⁶ The use of force multipliers has a substantial psychological impact, boosting the morale of friendly forces while deterring or demoralizing adversaries through the perception of superior capability.

Furthermore, the effectiveness of force multipliers is maximized when integrated into a cohesive strategy. The combined use of various multipliers, such as air power, electronic warfare, and special operations forces, creates a synergistic effect that amplifies overall combat effectiveness.¹⁷

¹² B. Menon, "Understanding Force Multipliers," News and Analysis, *SP Aviation*, (September 10, 2023), <https://www.sps-aviation.com/story/?id=1307>.

¹³ William J. Perry, "Information Technology as a Force Multiplier," News and Analysis, *Hoover Institution*, (October 30, 1998), <https://www.hoover.org/research/information-technology-force-multiplier>.

¹⁴ Daniel C. Billing et al., "The Implications of Emerging Technology on Military Human Performance Research Priorities," *Journal of Science and Medicine in Sport* 24, no. 10 (October 1, 2021): 947–53, doi: 10.1016/j.jsams.2020.10.007.

¹⁵ Perry, "Information Technology as a Force Multiplier."

¹⁶ M. Cucinotta et al., "Integrating Adaptive Smart Technology for 40mm Weapon Platforms," *2012 IEEE Systems and Information Engineering Design Symposium*, 2012, 79–84, doi:10.1109/SIEDS.2012.6215121.

¹⁷ Benjamin M. Jensen, "Small Forces and Crisis Management," *The US Army War College Quarterly: Parameters* 45, no. 1 (March 1, 2015), doi:10.55540/0031-1723.2813.

Global Development of DEWs

Advancements in DEWs have been underway for several decades. In the United States, research into microwave physics began in the 1930s, while laser technology development started in the 1960s.¹⁸ One of the major challenges due to which laser weapons could not be used in warfare is their huge size, weight and power (SWaP). The early laser weapons were significantly bigger and heavy. They were transported through separate aircraft to hold the equipment. For instance, the megawatt-class airborne laser weapons developed in the late 1990s required 747 aircraft to transport their equipment.¹⁹

However, recently, developed laser weapons are lighter in weight and smaller in size. With reduced SWaP, the use of laser weapons in warfare will be increased for two reasons; first, due to technological advancements, the use of low-cost and precision weapons with minimum causality rate is a preferred choice on the battlefield. Second, due to the advent of threats and the introduction of emerging technologies in warfare, DEWs can achieve desired results for warfare. One such technological advancement and popping threat is hypersonic missile technology, for which no defence system proved to be effective yet, and in this respect directed energy countermeasures are said to be an effective countermeasure to hypersonic missiles than other kinetic solutions.²⁰

According to a report, due to high demand and utility, the global DEWs market in 2029 is projected at \$17.4 billion and the market share in 2022 was

¹⁸ John P. Geis, *Directed Energy Weapons on the Battlefield: A New Vision for 2025*, report* (Alabama: Center for Strategy and Technology, 2003). <https://apps.dtic.mil/sti/pdfs/ADA463429.pdf>.

¹⁹ Obering, "Directed Energy Weapons Are Real . . . And Disruptive."

²⁰ Obering, "Directed Energy Weapons Are Real . . . And Disruptive."

\$ 9.24 billion.²¹ The factors contributing to high demand include increasing operational requirements by the militaries across the world particularly after the Russia-Ukraine war, effectiveness against small drones and multiple targets, rise in research and development, etc.

▪ ***United States***

The United States manages its DEWs programs through the Army, Navy, and Air Force, with oversight by the Office of the Under Secretary of Defense for Research and Engineering (OUSD[R&E]) and coordination by the Principal Director for Directed Energy (DE). The Directed Energy roadmap prioritizes developing DEWs for military and other strategic uses, aiming to boost the power of HEL weapons from 150 kilowatts to 1 megawatt by 2030.²²

The US currently deploys several DE systems, including the Navy's ODIN (Optical Dazzling Interdictor), HELIOS (High-Energy Laser with Integrated Optical-Dazzler and Surveillance), and the Solid-State Laser – Technology Maturation program. The Marine Corps uses CLaWS (Compact Laser Weapon System), while the Air Force has the HELWS (High Energy Laser Weapon System) and THOR (Tactical High Power Microwave Operational Responder).²³

In January 2023, US Army's Rapid Capabilities and Critical Technologies Office (RCCTO) was funding an HPM prototype project worth

²¹ Fortune Business Insights, "Directed Energy Weapons Market to Reach USD 17.43 Billion by 2029 | Fortune Business Insights™," December 06, 2022, <https://www.globenewswire.com/news-release/2022/12/06/2568330/0/en/Directed-Energy-Weapons-Market-to-Rreach-USD-17-43-Billion-by-2029-Fortune-Business-Insights.html>

²² Sayler et al, *Department of Defense Directed Energy Weapons*.

²³ Stew Magnuson, "Directed Energy Weapons: Here Now? Or 5 Years Off?", *National Defense*, February 29, 2024, <https://www.nationaldefensemagazine.org/articles/2024/2/29/editors-notes-directed-energy-weapons-here-now-or-5-years-off>.

\$66.1 million to counter swarm drones in a single shot.²⁴ In February 2022, the U.S. Navy successfully tested the Laser Layered Defense (LLD) system, intercepting multiple aerial targets, including simulated cruise missiles, at the White Sands Missile Range. The system, designed for use across various domains and platforms, is expected to enhance future naval operations.²⁵ In 2020, Admiral Michael Gilday, then commander of the US Sea services, identified lasers, hypersonic, and networking as his top three technological priorities. The increasing threat posed by precision weapons, including hypersonic missiles from Russia and China, has raised significant concerns for the U.S. In this context, laser weapons are seen as a promising solution for countering hypersonic threats.²⁶

In 2019, the Air Force Research Laboratory (AFRL) successfully tested a laser weapon system that intercepted and destroyed air-launched missiles in flight. As part of the Self-Protect High Energy Laser Demonstrator (SHiELD) program, this technology aims to develop a laser system that can be mounted on an aircraft pod, enhancing its defensive capabilities against surface-to-air (SAM) and air-to-air (AAM) missiles.²⁷

The Director of AFRL's Directed Energy Directorate stated that this advancement is expected to be a game-changer for war fighters in the future.²⁸

²⁴ David Szondy, "US Army awards contract for microwave weapon to counter drone swarms," *New Atlas*, January 24, 2023. <https://newatlas.com/military/us-army-awards-contract-microwave-weapon-counter-drone-swarms/>.

²⁵ Warren Duffie Jr., "U.S. Navy Conducts Historic Test of New Laser Weapon System," *Naval News*, April 14, 2022, <https://www.navalnews.com/naval-news/2022/04/u-s-navy-conducts-historic-test-of-new-laser-weapon-system/>.

²⁶ John M. Doyle, "Navy/Marine Corps Wish List: Subs, Hypersonics, Training and Education," *Seapower*, December 3, 2020, <https://seapowermagazine.org/navy-marine-corps-wish-list-subs-hypersonics-training-and-education/>.

²⁷ 88th Air Base Wing Office of Public Affairs, "AFRL Completes Successful Shoot down of Air-Launched Missiles," *The Air Force Research Laboratory*, May 3, 2019, <https://afresearchlab.com/news/air-force-research-laboratory-completes-successful-shoot-down-of-air-launched-missiles/>.

²⁸ 88th Air Base Wing Office of Public Affairs, "AFRL Completes Successful Shoot down of Air-Launched Missiles."

Similarly, the Counter-electronics High-powered Microwave Advanced Missile Project (CHAMP) is a directed energy weapon that, as an air-launched cruise missile equipped with a high-power microwave payload, can disable electronic and data systems while minimizing or eliminating collateral damage.²⁹

One of the directed energy weapons deployed in Afghanistan was the US Active Denial System, which uses millimetre-wave technology to address potential threats without causing loss of life. Developed by the AFRL, the system was ultimately withdrawn due to non-technical issues, including concerns about human rights and the ethical implications of using the weapon.³⁰

Since 2014, the US Navy has equipped a naval ship with a prototype solid-state Laser (SSL) designed to target surface vessels and unmanned aerial vehicles (UAVs). Enhanced versions currently in development aim to counter anti-ship cruise missiles (ASCMs). Ongoing advancements are focused on expanding the use of laser technology for weapon systems, surveillance, and ASCM defense.³¹

The United States Air Force is actively researching and developing various laser technologies to explore their potential for both offensive and defensive operations. The AFRL has conducted war games to showcase how these weapons could be employed to protect U.S. airbases from missile

²⁹ “CHAMP - Lights Out,” *Boeing*, October 22, 2012, <https://www.boeing.com/features/2012/10/bds-champ-10-22-12.page>

³⁰ Benjamin Buch, Katherine Mitchell, “The Active Denial System: Obstacles and Promise.” https://www.wm.edu/offices/global-research/research-labs/pips/_documents/pips/2011-2012/active_denial_system.pdf.

³¹ “*Navy Lasers, Railgun, and Gun-Launched Guided Projectile: Background and Issues for Congress*,” report*(Congressional Research Service, 2022), <https://sgp.fas.org/crs/weapons/R44175.pdf>.

attacks.³² During the war games, pilots were trained using virtual reality simulations to tackle contemporary warfare challenges, including encounters with DEWs.

▪ ***Russia***

Since 2010, Russia is actively involved in developing new weapons with potentially disruptive effects i.e., ‘weapons based on new physical principles such as radiological, genetic and DEWs.’³³ Russia is developing a variety of directed energy weapons to safeguard its use of the Electromagnetic Spectrum (EMS) and to counteract the EMS activities of Western nations and NATO. This involves employing various techniques such as surveillance, jamming, and protective measures. In 2018, President Vladimir Putin highlighted several new technologies that Russia has either developed or about to complete, including laser weapons. He stated that the country has reached significant milestones in laser weapon development, which will be integrated into the military to enhance Russia’s overall defense capabilities.³⁴

Russia claimed to have deployed laser weapons against a Ukrainian drone in 2022. Deputy Prime Minister Yuri Borisov stated that following the successful use of the Zadira laser weapon in Ukraine, the country is now moving towards mass production of these systems. However, both the US and Ukraine have denied any reports of laser or DEW usage by Russia during the conflict.³⁵

³² Shelley K. Mesch, “AFRL Wargames Simulation Focuses on Directed, Kinetic Energy Capabilities,” *Inside Defense*, February 14, 2022, <https://insidedefense.com/daily-news/afri-wargames-simulation-focuses-directed-kinetic-energy-capabilities>

³³ Samuel Bendett et al., “Advanced Military Technology in Russia,” *Chatham House*, 2021. <https://www.chathamhouse.org/sites/default/files/2021-09/2021-09-23-advanced-military-technology-in-russia-bendett-et-al.pdf>

³⁴ Bart Hendrickx, “Peresvet: a Russian mobile laser system to dazzle enemy satellites,” *The Space Review*, June 15, 2020, <https://www.thespacereview.com/article/3967/1>

³⁵ Defense News, “Russia claims its Zadira laser weapon destroyed a drone in Ukraine,” May 19, 2022, <https://www.defensenews.com/global/europe/2022/05/19/russia-claims-its-zadira-laser-weapon-destroyed-a-drone-in-ukraine/>.

One of the land-based systems, Peresvet, is a truck-mounted laser cannon deployed near ICBM bases for protection. While it lacks the power to destroy incoming targets, it can blind or disrupt their optical sensors and is also designed to counter small drones.³⁶ The main difference between Peresvet and Zadira is that Peresvet can blind or disrupt targets, whereas Zadira has the capability to destroy them. To address future challenges in space, Russia is developing directed energy weapons designed to disrupt and dazzle the optical sensors of surveillance satellites in low Earth orbit.³⁷

▪ ***China***

China is another major player when it comes to the development of DEWs. From the 863 plans,³⁸ China's Hi-tech innovation and development program, it is evident that China is focusing more on the development of new technologies including DEWs. During the Sino-Indian border clashes in 2020, reports suggest that China employed microwave weapons to incapacitate Indian soldiers. The high-energy electromagnetic radiation caused Indian troops to experience vomiting and loss of stability for about 15 minutes. This temporary disadvantage allowed Chinese forces to capture two strategically significant hilltops.³⁹

Furthermore, China has been utilizing DEWs, including its HPM anti-missile system and laser weapons, since 2010. One notable HPM weapon system, which received the National Science and Technology Progress Award in 2017, is portable and capable of disrupting electronic systems. Another

³⁶ Hendrickx, "Peresvet: A Russian mobile laser system to dazzle enemy satellites."

³⁷ Iain Boyd, "Russians reportedly building a satellite-blinding laser – an expert explains the technology," *The Conversation*, July 26, 2022, <https://theconversation.com/russians-reportedly-building-a-satellite-blinding-laser-an-expert-explains-the-technology-186890>

³⁸ "National High-Tech R&D Program (863 Program)," accessed April 13, 2024, https://www.mfa.gov.cn/web/system/index_17321.shtml.

³⁹ Joe Evans, "China uses microwave weapons to blast Indian troops in disputed border region," *The Week*, 17 NOV 2020, <https://www.theweek.co.uk/108688/china-deploys-microwave-weapons-against-indian-troops>.

microwave weapon, known as Poly WB-1, has broader applications beyond perimeter security and is intended for use by the Chinese Navy.⁴⁰

Portable Laser systems, which can be mounted on vehicles, are designed for crowd control and dispersal by law enforcement agencies. Another truck-mounted laser weapon system, known as Silent Hunter, is specifically designed to target small drones and has an effective range of approximately 200 meters to 4 kilometers.⁴¹ Besides developing new types of DEWs, China is also developing countermeasures to such weapons. In January 2023, China claimed that the military has invented a shield meant to protect missiles and other military hardware from being dazzled by laser weapons.⁴²

In the context of the technological race with the US, China is making notable advancements in new technologies, including DEWs. The Chinese recognize the potential of DEWs to disrupt enemy satellites in space, drones in the air, and small boats at sea, and have accordingly developed weapons to address these capabilities.⁴³

China has also been accused of using microwave weapons against US diplomats in Havana, leading to what is referred to as the “Havana syndrome.” The evidence suggesting that microwave weapons can cause harmful effects

⁴⁰ Andrew Griffin, “China reveals long-range heat ray gun,” *The Independent*, December 15, 2014, <https://www.independent.co.uk/tech/china-reveals-longrange-heat-ray-gun-9925713.html>.

⁴¹ Jeff Martin, “Check out What China Brought to One of the World’s Largest Defense Exhibitions,” *Defense News*, February 17, 2019, <https://www.defensenews.com/digital-show-dailies/index/2019/02/17/check-out-what-china-brought-to-one-of-the-worlds-largest-defense-exhibitions/>.

⁴² Stephen Chen, “Chinese military invents smart shield designed to make laser weapons useless,” *South China Morning Post*, January 12, 2023, <https://www.scmp.com/news/china/science/article/3206540/chinese-military-invents-smart-shield-designed-make-laser-weapons-useless>.

⁴³ Anastasios Giannakis, Ethan Wacaster, “Directed Energy Weapons: Recent Developments and Utilization,” *The Counter Terrorism Group*, May 31, 2021, <https://www.counterterrorismgroup.com/post/executive-summary-directed-energy-weapons-recent-developments-and-utilization>.

on humans is undeniable,⁴⁴ however, the involvement of China in Havana syndrome is still a mystery.

Development of DEWs in South Asian Context

▪ *Indian DEWs Programme*

In March 2022, the Indian Ministry of Defence outlined eighteen key platforms for industry-led design and development. Within the “Make I” categories, DEWs are prioritized second, following hypersonic glide vehicles. India aims to achieve self-reliance in these technologies by engaging the domestic industry.⁴⁵

The Indian Defence Research and Development Organization (DRDO) has indicated its commitment to a national program focused on DEWs. To achieve this, it plans to establish short, medium, and long-term objectives for developing various DEW variants with power levels of up to 100 kilowatts, collaborating with the domestic private sector.⁴⁶ The Head of DRDO stated that the world is increasingly shifting towards DEWs due to their importance, and India has also been conducting experiments in this field over the past few years.⁴⁷ The DRDO has established two laboratories, the Centre for High Energy Systems and Sciences and Laser Science & Technology Centre to work exclusively on DEWs.⁴⁸

As described in previous sections, regarding the claims of Chinese use of microwave weapons during recent tensions with India, the development of DEWs has become a priority for India. The country has already created two

⁴⁴ Etfā Khurshid Mirza, “Microwave Weapons and Impact on Human Beings.”

⁴⁵ Press Information Bureau Delhi, “Ministry of Defence identifies 18 major platforms for industry led Design and Development” March 11, 2022, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1805135>.

⁴⁶ Rajeswari Pillai Rajagopalan, “What Are India’s Plans for Directed Energy Weapons?,” *The Diplomat*, September 24, 2020, <https://thediplomat.com/2020/09/what-are-indias-plans-for-directed-energy-weapons/>.

⁴⁷ Rajagopalan, “What Are India’s Plans for Directed Energy Weapons?”

⁴⁸ Rajagopalan, “What Are India’s Plans for Directed Energy Weapons?”

anti-drone DEW systems capable of engaging aerial targets at a range of 2 kilometers.⁴⁹ One of the systems, the Kilo Ampere Linear Injector (KALI), was developed by DRDO in collaboration with the Bhabha Atomic Research Centre (BARC) to target long-range missiles. The Indian Defense Minister refrained from providing additional details about the weapon system, citing national security concerns, which highlights its strategic importance for India.⁵⁰

According to the 10-year roadmap, the first phase will require the development of 20 tactical HEL systems with a range of 6 to 8 km. In the second phase, the range of these systems will be extended to 20 km, along with the addition of 20 high-power electromagnetic weapon systems that will have a range of 15 km.⁵¹

▪ ***Pakistan's DEWs Development***

Given India's ambitious plans to develop eighteen technologies, including DEWs, and their active pursuit of these initiatives, Pakistan feels compelled to respond in this area. Former Chief of Naval Staff Admiral Zafar Mehmood indicated Pakistan's intention to develop DEWs to counter Indian offensive capabilities. He mentioned that laser-based DEWs will be deployed on warships ordered from China. In 2022, Pakistan inducted two Type 054A/P frigates into its navy. These Chinese frigates are capable of operating DEWs, and once they are in service, they will enhance Pakistan's naval capabilities to

⁴⁹ Rajat Pandit, "DRDO Plans Star Wars-Style Weapons for Battles of Future," *Times of India*, April 14, 2022, https://timesofindia.indiatimes.com/india/drdo-plans-star-wars-style-weapons-for-battles-of-future/articleshow/78096712.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst%25252C.

⁵⁰ The Economic Times, "Government refuses information on KALI 5000 citing national security", Jul 14, 2018. <https://economictimes.indiatimes.com/news/defence/government-refuses-information-on-kali-5000-citing-national-security/articleshow/50234073.cms>.

⁵¹ The Economic Times, "Government refuses information on KALI 5000 citing national security."

address future regional challenges.⁵² Considering the emerging challenges in the South Asian environment, where India has prioritized DEWs, it is essential for Pakistan to develop its capabilities in this area to enhance its technological edge, particularly in DEWs. These weapons offer several advantages over kinetic options.

Applications and Implications of DEWs

As discussed earlier, the paper focuses on HPMs and HELs as the two main types of DEWs. HPM primarily utilize radiofrequency (RF) energy, operating with electromagnetic pulse (EMP) peak power measured in the frequency range from megahertz to gigahertz. These microwave-based weapons can disrupt electronic systems by targeting antennas or penetrating through cracks, wires, or metal conduits.⁵³

In contrast, HEL generates energy in the form of continuous waves or pulses, varying in power from kilowatts to megawatts. Lasers can effectively cut through various materials, rupture pressurized vessels, and disable or blind sensor and electronic systems.⁵⁴ HEL and HPM operate within the electromagnetic spectrum, yet they differ significantly in operation and effect. HEL utilizes light energy and can be deployed from ground or aerial platforms, offering a wide range of military applications.⁵⁵

Laser Communication, also referred to as Free-Space Optics (FSO), plays a critical role in both civilian and military contexts due to its low power consumption, robust signal strength, and reliable transmission capabilities. It

⁵² Usman Ansari, "Outgoing Pakistan Navy Chief Reveals Details of Modernization Programs," *Defense News*, October 15, 2020, <https://www.defensenews.com/naval/2020/10/14/outgoing-pakistan-navy-chief-reveals-details-of-modernization-programs/>.

⁵³ John A. Brunderman, "High Power Radio Frequency Weapons: A Potential Counter to U.S. Stealth and Cruise Missile Technology," *Center for Strategy and Technology* (1999), Air War College, <https://apps.dtic.mil/sti/tr/pdf/ADA393362.pdf>.

⁵⁴ *Ibid.*

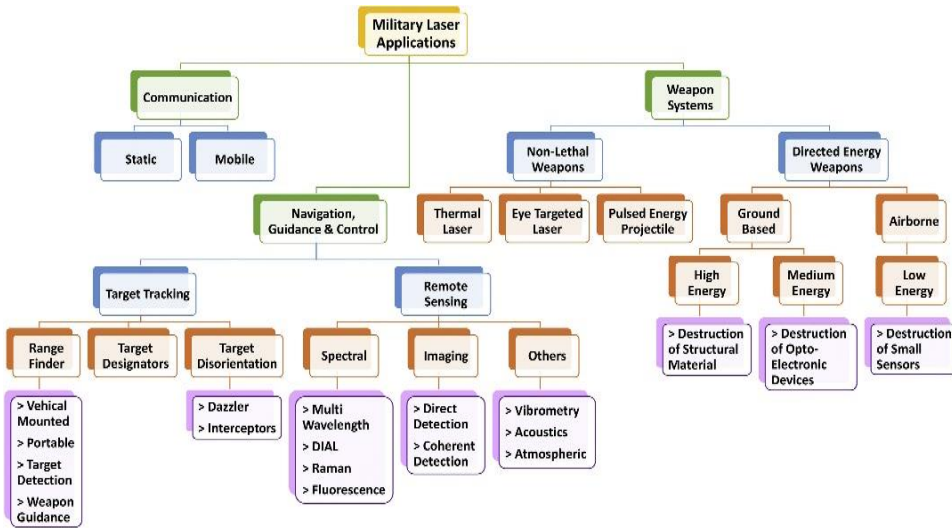
⁵⁵ Obering, "Directed Energy Weapons Are Real . . . And Disruptive, 10.

facilitates communication links across various domains, including terrestrial, aerial, and maritime environments.⁵⁶ Other applications of HELs include employment in the battlefield for safety measures, such as navigation, guidance, and threat detection systems. HELs are also pivotal in remote sensing applications like Light Detection and Ranging (LIDAR), enhancing air force capabilities for precise data collection and damage assessment. These technologies underscore the diverse and vital roles of lasers in modern military operations.

In offensive operations, laser weapons are employed to incapacitate or render targets immobile. They are effective in intercepting aerial threats such as rockets, small drones, aircraft, and cruise missiles. Laser weapons serve dual roles as target designators and range finders, ensuring precise engagement with pinpoint accuracy. One of their key advantages is their ability to minimize casualties during warfare.⁵⁷ Furthermore, they find application in non-lethal crowd control scenarios, where they can temporarily disorient individuals or groups through inflicted pain or induced blindness, effectively managing riots and disturbances.

⁵⁶ Obering, "Directed Energy Weapons Are Real . . . And Disruptive, 10.

⁵⁷ Ahmed, Mohsin & Ali, "Survey and technological analysis of laser and its defense applications,"



Military Applications of High-Energy Lasers⁵⁸

HPM find extensive military applications spanning tactical and operational levels. Unlike conventional methods that destroy entire equipment or components, HPMs infiltrate targets through vulnerabilities such as cracks, antennas, wires, metal conduits, or seals. Once inside, they disrupt, damage, or destroy specific parts of the equipment. The effects produced by HPMs vary depending on the amount of energy directed at the target, leading to graduated impacts on electronic systems and equipment. This variability in lethality underscores the versatility and strategic value of HPM technology in military operations.⁵⁹

⁵⁸ Ahmed, Mohsin & Ali, “Survey and technological analysis of laser and its defense applications,”

⁵⁹ Eileen M. Walling, “High Power Microwaves: Strategic and Operational Implications for Warfare”, *Center for Strategy and Technology*, no.11(2000): 4 <https://apps.dtic.mil/sti/pdfs/ADA425472.pdf>.

Characteristics of HPM

Serial No.	How HPM Disable Enemy's Potential to Operate the System	Level of Harm to the System	Example	Effect
1	Deny	No Harm	Circuit, minor distortions in radio etc.	Temporary; the system may get back to normal when it leaves the area
2	Degrade	Minimal Damage,	Electronic hardware systems; malfunctioning power buttons	Temporary; may require minor repairs
3	Damage	Moderate	Communication Jamming, distorting signals	Permanent effects; depending on the level of attack
4	Destroy	Lethal	Affects the entire System; electrical grids, defence systems	Permanent, replace the entire system

The Author has developed the chart and presented the characteristics of HPM obtained from the cited article in a simplified manner for better understanding.⁶⁰

⁶⁰ Obering, "Directed Energy Weapons Are Real . . . And Disruptive,"

Implications of DEWs

DEWs by major global powers like the US, China, Russia, as well as regional players such as India and Pakistan, it is crucial to examine the implications of DEWs at various levels of warfare. This examination establishes the rationale behind these nations' substantial investments in DEW technology for military applications.

▪ ***Operational Effects***

States are increasingly turning to technologies capable of causing significant harm to adversaries without physical impact, with DEWs emerging as viable options for future conflicts. These weapons utilize different intensities of light and the electromagnetic spectrum, resulting in a spectrum of effects that can range from lethal to non-lethal. The severity of these effects depends on the intensity and duration of exposure to the weapon.⁶¹

Once DEWs are operational and deployed, they are poised to play a crucial role during wartime or crisis scenarios by delivering non-kinetic effects. These include penetrating adversary air defense systems, disrupting command and control networks, and incapacitating communication systems. DEWs can also disperse or dazzle enemy troops and engage targets across air, sea, and land domains. As a result, these weapons are anticipated to be employed in anti-access and area-denial operations.⁶²

An EMP has the capability to disrupt electrical systems and high-technology microcircuits. Given the increasing dependence of critical civilian infrastructure on electric systems and network-based technology, an EMP

⁶¹ Jürgen Altmann, "Millimetre waves, lasers, acoustics for non-lethal weapons? Physics analyses and inferences," *Physics analyses and inferences* 16, (2008), https://www.ssoar.info/ssoar/bitstream/handle/document/26039/ssoar-2008-altmann-millimetre_waves.pdf.

⁶² Jason D Ellis, "Directed-Energy Weapons: Promise and Prospects," report* (Centre for New American Studies, 2015). https://www.files.ethz.ch/isn/190363/CNAS_Directed_Energy_Weapons_April-2015.pdf.

device, such as an E-bomb, can significantly impact these systems by denying, degrading, damaging, or even destroying them.⁶³

The HELs, renowned for their exceptional precision, serve as potent strike weapons capable of effectively targeting small drones. Their lightweight nature enables deployment across various platforms including mobile, land, air, sea, and space, thereby offering a strategic advantage early in conflicts.⁶⁴ Due to their precise targeting capabilities, HELs can function effectively as strike weapons against small drones. Their lightweight design allows them to be deployed on diverse platforms such as mobile units, land vehicles, aircraft, naval vessels, and space assets, providing a strategic edge in the initial stages of conflict.⁶⁵

▪ ***Strategic Effects***

When it comes to strategic effects, DEWs wield significant strategic effects across modern military operations. One of them is the disruption of adversary's communication systems. For instance, targeting communication satellites has the potential to induce extensive communication blackouts, impacting communications and critical infrastructure alike. Similarly, disabling GPS or other navigation satellites could severely disrupt logistical operations, transportation networks, and precision-dependent activities, leading to widespread strategic implications. Furthermore, damaging satellites used for earth observation purposes, such as weather forecasting and disaster response, threatens to undermine crucial decision-making capabilities and resilience efforts in the face of natural disasters and climate events.⁶⁶

⁶³ David P. Fidler, "The Meaning of Moscow: 'Non-Lethal' Weapons and International Law in the Early 21st Century," *International Review of the Red Cross* 87, no. 859 (2005): 525–52, <https://doi.org/10.1017/S1816383100184371>.

⁶⁴ Ellis, "Directed-Energy Weapons: Promise and Prospects."

⁶⁵ Wheeler and Brehm, "Directed Energy Weapons."

⁶⁶ "Directed Energy Weapons: Disruptors and Safeguards in the Space Economy", *New Space Economy*, <https://newspaceconomy.ca/2024/03/18/directed-energy-weapons-disruptors-and->

DEWs also support anti-access and area denial strategies by neutralizing enemy platforms and defenses, thereby limiting their operational reach and influence in specific regions. With precise targeting capabilities, DEWs can selectively engage critical enemy assets such as drones, missiles, and aircraft while minimizing collateral damage. DEWs can be used to control crowds in non-lethal way. They can be effective in confusing crowds without harming them permanently. With it, they can be useful in strategic signaling, as they can showcase a state readiness and technological advancement in face of emerging threats. Furthermore, they can play role of force multipliers. They can also be used as low-cost solution for emerging threats such as autonomous drones and drone swarm. DEWs technology is likely to matured and their cost as compared to missile and other kinetic weapons will be less. They will also provide precision, flexibility and strategic advantage.

Potential Use of DEWs in South Asian Conflicts

As technology continues to transform warfare in the modern era, the role of emerging disruptive technologies is increasingly vital. With innovation, the strategies for employing these technologies are equally important. In the context of evolving threats in South Asia, particularly between India and Pakistan, how these technologies are utilized in future conflicts will be critical. The nation that can develop superior employment strategies in both offensive and defensive operations will likely gain the upper hand.

Given the prominence of DEWs in contemporary warfare, their potential use in future conflicts is highly probable. Pakistan must prepare for any challenges arising from India's deployment of DEWs. Possible applications of these weapons in the South Asian context include:

safeguards-in-the-space-economy/#:~:text=DEWs%20harness%20focused%20beams%20of,disable%20sensors%2C%20or%20disrupt%20communications.

- First, combining with other weapons systems, DEWs have the potential to Disrupt command, control, and communication (C3) systems. It can interfere with the communication networks that military forces rely on for coordination and operational effectiveness. By disrupting these systems, a military can create confusion, hinder decision-making, and reduce the enemy's situational awareness.
- Furthermore, it can be utilized in targeting air defense systems or their components. DEWs can specifically target the components of air defense systems, such as radars and missiles, rendering them inoperable. For instance, DEWs can significantly multiply India and Pakistan's existing defense capabilities by complementing its advanced missile systems, with precise and scalable energy-based attacks. They can play a role in India's air defense by countering swarm drone threats and intercepting ballistic missiles, thereby strengthening its multi-layered defense network.
- DEWs have the potential to offer Pakistan cost-efficient and rapid-response capabilities to neutralize threats, reducing reliance on traditional kinetic systems. Analyzing the February 2019 Balakot strikes, where Indian fighter aircraft violated Pakistani airspace, highlights that similar incident could occur in the future. Moreover, there have been numerous sightings of small drones and quadcopters used for surveillance along the Line of Control from the Indian side. With DEWs, Pakistan would be capable of precisely targeting any intruding aerial objects, using laser systems to disrupt the electronic components or dazzle the optical systems of these drones.
- By integrating DEWs with its existing nuclear and conventional deterrence architecture, Pakistan can enhance strategic stability and maintain a credible defense posture in South Asia. Moreover, DEWs

integrate seamlessly with India's space and cyber capabilities, creating a synergistic effect that boosts overall strategic dominance in the region.

- In addition, DEWs can emit energy that disrupts radar signals, effectively blinding the enemy's surveillance and targeting capabilities. This jamming can prevent detection of friendly forces and enable stealthy movements or surprise attacks.
- Laser-based weapons can be used for highly accurate aerial strikes, minimizing collateral damage. This precision allows military forces to eliminate specific targets while protecting surrounding infrastructure and civilians.
- DEWs can be employed to incapacitate soldiers or deter hostile actions without causing lethal damage. Their use in this context raises ethical considerations, as they may affect civilian populations inadvertently.
- DEWs can effectively target drones, which are increasingly used for surveillance and attacks. By disabling or destroying these systems, military forces can protect their airspace from unwanted intrusions. DEWs can target the electronic systems of enemy military hardware, rendering them inoperable. This capability can cripple an opponent's operational effectiveness by targeting key technologies like communication devices and weapon systems.
- Furthermore, DEWs offer stealth capabilities that can help mitigate threats from incoming missiles and enhance the protection of fighter aircraft. During a crisis, these weapons could defend against swarm drones and unmanned combat aerial vehicles, as well as safeguard forward-deployed troops and infrastructure near the border.
- The situation along the Line of Control remains tense, with frequent ceasefire violations by India resulting in civilian casualties. DEWs

could be employed to dazzle Indian soldiers without crossing the border, neutralizing threats while maintaining a strategic advantage. A similar technique was utilized by China during the Sino-Indian standoff in 2020.

Options for Pakistan

Considering India's ambitions in space, the potential deployment of DEWs on space-based platforms to target long-range missiles poses a significant risk to Pakistan's critical infrastructure. If India achieves this capability, Pakistan's vulnerable assets could be exposed to laser attacks, which could inflict damage on soft targets, including electronic systems and personnel. Therefore, Pakistan must implement measures to protect these soft targets.

- To counter the effects of laser weapons with electro-optical capabilities, several defensive strategies can be considered: Using artillery or mortars to suppress known or suspected DEW locations. Smoke rounds can also effectively obscure laser devices.
- Minimizing or blocking the exposure of glass surfaces to enemy lines of sight by placing them in covered positions or using smoke to reduce effectiveness. Equipment with glass components should be kept shielded until needed. Limiting the number of soldiers in vulnerable areas can decrease the likelihood of injury, and employing night vision goggles during night operations can further protect against harm. Covering optical lenses with tubular extensions can help mitigate vulnerability.
- Defending against EMP attacks poses a significant challenge, as they can cause varying degrees of damage depending on proximity to the source and exposure levels. Such attacks may last only seconds but can impact large areas, resulting in irreparable damage to unprotected systems. The best defense against EMP attacks is to store equipment

within metallic shields, as other measures, like sandbags or terrain masking, may prove ineffective.

- Pakistan must consider these emerging threats related to DEWs in its policymaking and force structuring to avoid being unprepared on the battlefield. Because DEWs are difficult to intercept or detect, their use by either side may not be immediately identifiable, allowing for the disruption of electronic components or sensors without total destruction of the equipment.

Conclusion

In light of emerging challenges, nations are increasingly investing in advanced technologies to enhance their military capabilities and secure a strategic advantage at the onset of conflict. The demand for non-kinetic weapons, particularly DEWs, is on the rise due to their precision, cost-effectiveness, portability, operational flexibility, and resilience against interception. As these weapons become operational, they are expected to counter leading offensive technologies, driving major powers like the U.S., Russia, and China to develop robust DEW programs. These weapons can significantly enhance the capabilities of existing defensive and offensive systems and can play role of force multiplier. In the context of Indo-Pak tensions, the potential for future conflicts may see the deployment of DEWs, particularly following India's military modernization efforts and its recent experiences with the Chinese DEW use. This underlines the urgency for Pakistan to enhance its research and development in DEWs to effectively counter any Indian advancements. By doing so, Pakistan can maintain strategic equilibrium in the region, ensuring it is well-prepared to respond to any threats that arise from the evolving landscape of modern warfare.

**ABROGATION OF ARTICLE 370 AND 35-A:
POLICY OPTIONS FOR PAKISTAN**

Asad Ullah Khan

Abrogation of Article 370 and 35-A: Policy Options for Pakistan

Asad Ullah Khan *

Abstract

With far-reaching implications, August 5, 2019, marked a pivotal moment in South Asia's geopolitics, diplomacy, regional peace, and human rights. India's decision to abrogate Article 370 and 35-A in Indian Illegally Occupied Jammu and Kashmir (IIOJK) profoundly impacted the dynamics of the IIOJK and new subtleties have appeared after the recent elections of IIOJK assembly. This study addresses India's abrogation of Article 370(A) and the response of the international community, implications for regional stability, and explores the policy options for Pakistan particularly after the recent Jammu and Kashmir Assembly elections. Over the past six years, India has implemented new domicile laws, land laws, and media policies within the occupied territory, reshaping the demographic landscape. These actions have stirred controversy and heightened tensions by contravening various United Nations Resolutions. This article closely examines the ongoing conflict in the context of frozen conflict theory. It touches upon the national and international implications along with insightful perspectives on the potential policy options to address the challenges posed by these developments. It discusses the situation after the recent election in IIOJK Assembly. This study concludes that the recent IIOJK elections have created an opportunity for Pakistan to reshape its policy. By leveraging soft power and amplifying Kashmiri voices, Pakistan can pursue a peaceful resolution aligned with their aspirations.

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Keywords: Jammu and Kashmir, Article 370, 35A, Abrogation of Article, India, Pakistan, Policy Options, Conflict of Jammu and Kashmir

Introduction

The conflict between India and Pakistan is deeply rooted in the history of both countries since their independence; in fact, the bitterness is traced prior to its formation. The conflict ignited in 1947, which led to division of the subcontinent into Pakistan and India. The IIOJK issue is entrenched into the division of the subcontinent. The princely states in the subcontinent were given a choice to accede to either India or Pakistan. Being the bone of contention, the Jammu and Kashmir conflict is pivotal in regional geopolitics, diplomacy, and human rights. Therefore, it demands strategies for peaceful resolution of Kashmir issue. However, Indian unilateral steps are further complicating the peaceful resolution of Kashmir issue.

In 2019, India's ruling Bhartiya Janata Party (BJP) abolished the special status of IIOJK under Article 370 and 35-A of the Indian constitution. Such an amendment stripped the special rights of Kashmiris over land ownership and employment in IIOJK. Such an authoritarian change in laws provoked resentment among the Kashmiris, and they blamed the government as the BJP seemed the architect of such political engineering against people of IIOJK. In the recent election of IIOJK assembly, people of IIOJK voted against the BJP and the newly formed assembly passed a resolution for restoration of special status of IIOJK.

Numerous studies have been conducted on this topic, offering valuable insights into various aspects, methodologies, and outcomes related to the Kashmir issue. R. W. Conway described Kashmir as a distinct valley surrounded by the Himalayas, highlighting its natural beauty, fertile land, and the importance of Srinagar as a trade hub and how Kashmir conflict impacts

the regional tension between India and Pakistan.¹ C. Zutshi has analyzed the region's division among India, Pakistan, and China, emphasizing the cultural diversity and geopolitical significance of its sub regions.² M. Ashraf explored Kashmir's ancient history, linking its origins to geological and archaeological findings of a prehistoric lake and how Kashmir issue is one of the most significant issues which can have international repercussions.³ Tariq Ali focused on the human rights violations under Indian military rule and called for global attention to Kashmir's struggle for self-determination.⁴ Finally, Aryal and Muneer assessed the impact of Article 370's abrogation, arguing it worsened political instability and human rights issues in the region.⁵

These studies provide detailed analysis of the Kashmir issue. However, there is a lack of literature related to Kashmir issue in the context of recent elections in the IIOJK and policy options for Pakistan. The article fills this gap by addressing what has been the international community's response to India's abrogation of Article 370(A), what are the implications for regional stability, and what policy options emerge in light of the recent Jammu and Kashmir Assembly elections? The significance of this study lies in its potential to provide practical policy solution on the abrogation of article 370 and 35-A especially after recent elections in IIOJK. This study utilizes qualitative

¹ Conway and W. Martin, "The Valley of Kashmir," *Nature* 53, no. 1362 (December 1895): 99–100, <https://doi.org/10.1038/053099a0>.

² C. Zutshi, "India, Pakistan, and the Kashmir Issue 1947 and Beyond," 2009, https://www.semanticscholar.org/paper/India-%2C-Pakistan-%2C-and-the-Kashmir-Issue-1947-and-Zutshi/4847caca77bfba589101b2b142a25be20961d117?utm_source=consensus.

³ M. Ashraf, "Earliest History of Kashmir (Archaeological and Geological Perspective)," 2017, [https://www.semanticscholar.org/paper/Earliest-History-Of-Kashmir-\(Archaeological-And-Ashraf/08b6ad4a828d45910346a0255d267ba554038741?utm_source=consensus](https://www.semanticscholar.org/paper/Earliest-History-Of-Kashmir-(Archaeological-And-Ashraf/08b6ad4a828d45910346a0255d267ba554038741?utm_source=consensus).

⁴ *Ibid.*

⁵ Saroj Kumar Aryal and Sania Muneer, "Geopolitics, Conflict and Narratives: An Assessment of Kashmir Conflict after the Abrogation of Article 370," *Journal of Asian and African Studies*, August 24, 2023, 370, <https://doi.org/10.1177/00219096231192318>.

methodology, and relies on the secondary data and descriptive and explanatory tools to address the undertaken research question.

This paper first presents the theoretical perspective, followed by a brief history of the Kashmir issue. It then provides a detailed account of the abrogation of Articles 370 and 35-A. Subsequently, it discusses the response of the international community, the implications for regional stability, the recent elections in IIOJK, and policy options for Pakistan. Finally, the paper concludes with its findings and provides policy solutions.

Theoretical Framework- Frozen Conflict

The abrogation of Article 370 and 35-A in Jammu and Kashmir has further exacerbated the situation by unfreezing the conflict between the two countries. Frozen conflicts are conflicts that have become frozen and have remained in this condition for several years. In this case, the Jammu and Kashmir issue was also characterized as frozen conflict because of its prolonged stalemate.⁶ In a frozen conflict, freezing often occurs when there is equality of power between the rival parties, and none of them see the prospect of a sudden change in the state of affairs. Jammu and Kashmir is a bone of contention between Pakistan and India from August 1947, and both are not ready to compromise on their stated positions.⁷

Another major characteristic of frozen conflict is in the form of oscillations. The conflict oscillates between periods of melting and refreezing. The situation in Jammu and Kashmir was getting better when Pakistan and India had worked on maintaining peace and security along the Line of Control (LoC), while allowing people of the two sides to travel and trade.

⁶ Sumit Ganguly et al., "India, Pakistan, and the Kashmir Dispute: Unpacking the Dynamics of a South Asian Frozen Conflict," *Asia Europe Journal* 17, no. 1 (March 2019): 129–43, <https://doi.org/10.1007/s10308-018-0526-5>.

⁷ Ibid.

The goal of Pakistan was to enhance the lives of Kashmiris, as it engaged in bilateral dialogue with India at improving relations, which subsequently led to a freeze in violence levels. However, as the status quo in the case of Jammu and Kashmir conflict remained untouched till August 2019. Therefore, one may argue that the conflict was termed as frozen conflict. In this context, the Indian unilateral step towards change of status quo has altogether changed the very dynamics of the conflict. The abrogation of Articles 370 and 35-A in Jammu and Kashmir by India has unfrozen the conflict.

There is one more important aspect to it. The power of the relative parties also matters in the conflict. Therefore, the response to this phenomenon of unfreezing the conflict by the international community is different which could be observed in the later section of the paper. In addition to this, once the conflict is unfrozen it gives an opportunity to both the states involved in the conflict to take measures towards conflict resolution.⁸ However, in this particular scenario, Pakistan is relatively a less powerful state than India and since India has taken a step towards un-freezing the conflict this makes more space for Pakistan to build its narrative on the Jammu and Kashmir issue. Utilizing this space there is a need to revisit and draft an effective Kashmir strategy which may give fruitful results.⁹

Historical Context of the Jammu and Kashmir Dispute

In 1947, Muslim-majority Jammu and Kashmir was ruled by a Hindu leader Maharaja Hari Singh. The blend of demographics and leadership due to differences in religious ideologies and Indian backing to the Maharaja, laid the groundwork for creating instability and disputes over the Jammu and Kashmir region. The majority of the Kashmiris because of their religion and

⁸ Ibid.

⁹ Ibid.

demography, had inclinations towards joining Pakistan. While India was forcing the Kashmiri ruler to join India.

These tensions between the leadership and the nation have continued to grow ever since. Against a backdrop of growing internal unrest as Maharaja realized that he had lost the control over the Muslim Majority. Consequently, in October 1947, according to the Indian perspective ‘Instrument of Accession’ was signed whose date and validity is still under debate.¹⁰ The greed of getting Jammu and Kashmir by India rifted it into two parts. India solidified its control on the southern and eastern portions, popularly referred to as Valley, Jammu, and Ladakh. Meanwhile, Pakistan gained the northern and western areas, known as Azad Jammu and Kashmir and Gilgit Baltistan. Amidst this volatile situation, India approached United Nations, which issued Resolution 47 in April 1948, proposing a plebiscite to determine the future status of Jammu and Kashmir.¹¹ This dispute has been a source of persistent tension between India and Pakistan, leading to multiple conflicts, including two full-fledged wars and the Kargil crisis.

Articles 370 and 35-A

Article 35-A was introduced into the constitution of India as an integral component of amendments instituted through a presidential order in 1954, which was authorized under Article 370.¹² Under the scope of this article, the state of Jammu and Kashmir had the authority to define a specific category of individuals as “permanent residents,” offering them distinct legal status and

¹⁰ Erin Blakemore, “The Kashmir Conflict: How Did It Start?” *CULTURE*, May 3, 2021, <https://www.nationalgeographic.com/culture/article/kashmir-conflict-how-did-it-start>.

¹¹ Rakesh Ankit, “Kashmir, 1945-66: from empire to the Cold War” (PhD diss., University of Southampton, 2014), <https://eprints.soton.ac.uk/370019/>.

¹² Tejas Sateesha Hinder, The Presidential Order of 1954 and Article 35A: A Constitutional Criticism, accessed July 25, 2024, https://www.probono-india.in/Indian-Society/Paper/137_The%20Presidential%20Order%20of%201954%20and%20Article%2035A%20A%20Constitutional%20Criticism.pdf.

entitlements. A pivotal aspect of Article 35-A is its empowerment of the government of Jammu and Kashmir to extend entitlements and privileges to these designated “permanent residents.”¹³ These special rights and privileges hold a distinct status, which saved Kashmiris even if others appear to encroach upon any fundamental rights guaranteed by the broader Indian Constitution.

Article 35-A features the region’s autonomy within the broader Indian constitution. Its enactment through the 1954 presidential order, further augmented and facilitated through the scope of Article 370, highlights the distinctive position that Jammu and Kashmir hold.¹⁴ This article holds special position as it provides the state with the prerogative to establish a class of permanent residents thereby endowing them with exclusive legal rights and benefits. Also, these legal provisions provide a sense of security as it prevents from overriding them, even if they seem to impinge upon the fundamental rights upheld in the legal framework of India.¹⁵

Abrogation of Article 370 and 35-A

Article 35-A is a provision that legally provides the special status of “permanent residents” and their associated entitlements and privileges to Kashmiris, which differs from other residents of other parts of India. The Indian government on August 5, 2019, decided to abrogate it; simultaneously, they eliminated the special constitutional status previously held by the formerly autonomous region of IIOJK under Article 370 of the Constitution.¹⁶

¹³ “Article 370: What Happened with Kashmir and Why It Matters,” *BBC News*, August 5, 2019, <https://www.bbc.com/news/world-asia-india-49234708>.

¹⁴ “Kashmir’s Special Status: Five Things to Know,” News | *Al Jazeera*, August 5, 2019, <https://www.aljazeera.com/news/2019/8/5/kashmir-special-status-explained-what-are-articles-370-and-35a>.

¹⁵ “Explainer: What Are Articles 370 and 35A?” *Express Tribune*, August 5, 2019, <https://tribune.com.pk/story/2028458/explainer-articles-370-35a>.

¹⁶ Sameer P. Lalwani and Gillian Gayner, “India’s Kashmir Conundrum: Before and After the Abrogation of Article 370,” *US Institute of Peace*, 2020, <http://www.jstor.org/stable/resrep25405>.

This one-sided action fueled a sense of insecurity in the people of Jammu and Kashmir.

This unilateral abrogation of the articles in IIOJK significantly affected land, media, and domicile laws, giving rise to serious apprehensions. The alteration of land laws in Jammu and Kashmir by the Indian government nullified Article 35-A and granted permission for non-residents of Kashmir to own land and property in the region, effectively overlooking its legal and historical status. It also brought all the political parties on the same page even those who were pro-India earlier like People's Democratic Party (PDP), Mehbooba Mufti and others. This action, viewed as a violation of international standards, raised concerns about demographic manipulation and the demise of the region's distinctive cultural identity by the BJP. Shah Mahmood Qureshi, then Pakistan's Foreign Minister, rightly pointed out, the unilateral and illegal actions by the Indian government to revoke Articles 370 and 35-A are in clear violation of the UNSCR.¹⁷

The unilateral constitutional changes, coupled with on-ground measures such as the introduction of new domicile laws, have further exacerbated the challenges faced by the people of IIOJK. People from other areas of India were granted domicile certificates upon their settlement in the Jammu and Kashmir region. The important factor of religion has also been ignored in this regard. These illegal settlements were done to change the demographic nature of IIOJK into a Hindu majority region. Moreover, the recent changes in media laws and regulating the autonomy of media in the region was an attempt to silence the voices of Kashmiris on what actually is happening inside the valley. This disregard for local considerations infringes

¹⁷ "Watch: Pakistan's Foreign Minister Says Article 370 Is India's Internal Matter," *Swarajyamag*, May 7, 2021, <https://swarajyamag.com/insta/watch-pakistans-foreign-minister-says-article-370-is-indias-internal-matter>.

upon the right to free expression and diversity of voices, one of the most crucial elements in a vibrant democratic society.¹⁸

The Response of Pakistan and International Community after Revocation of Article 370 and 35A

This decision to immediately withdraw these provisions heightened tensions between Pakistan and India, both of which have historical territorial claims in the region, as Kashmiris aspire to be part of Pakistan. Pakistan criticized this unilateral move by India, considering it a violation of international agreements and UN resolutions that sought a peaceful resolution to the Jammu and Kashmir issue through dialogue and considering the desires of the Kashmiri people. Imran Khan, Pakistan's Prime Minister in 2019, emphasized, 'the unilateral abrogation of Article 370 by the Indian government is a violation of Simla Agreement and the UN Resolutions on Kashmir.'¹⁹

In response to Indian actions, Pakistan retaliated by taking several diplomatic measures, including down grading diplomatic relations with India, putting back trade, and appealing to international organizations to rally support for its stance globally. The Prime Minister of Pakistan and other officials discussed the IIOJK issue at various international platforms, including the United Nations, emphasizing the regional instability and the effects on the lives of Kashmiris.²⁰

Concerns about potential human rights abuses following the annulment gained substantial international attention because of its prominent

¹⁸ India: 'We Are Being Punished by the Law' - Three Years of Abrogation of Article 370 in Jammu & Kashmir," *Amnesty International*, September 2, 2022, <https://www.amnesty.org/en/documents/asa20/5959/2022/en/>.

¹⁹ "Imran Khan on Article 370: Move Will Further Deteriorate Relations between 'nuclear-Capable' Neighbours," *Indian Express*, August 5, 2019, <https://indianexpress.com/article/pakistan/imran-khan-on-article-370-move-will-further-deteriorate-relations-between-india-pakistan-5880527/>.

²⁰ Mubarak Zeb Khan, "Pakistan Formally Suspends Trade with India," *DAWN.COM*, August 10, 2019, <https://www.dawn.com/news/1499076>.

nature. Consequently, reports emerged regarding communication blockades, curfews, and accusations of mistreatment of civilians. Human rights organizations like Amnesty International and Human Rights Watch demanded openness, unbiased investigations, and the respect of fundamental rights in the region, further underscoring the urgency of the matter.

International responses varied after abrogation of article 370 and 35-A. While some states like China, expressed apprehension about the possible escalation of tensions in the region and called for dialogue between Pakistan and India.²¹ In contrast, United Arab Emirates (UAE), Sri Lanka, and the United States of America (USA) apparently supported India by giving mixed reviews while hoping for peace and stability without criticizing the action.²² This divergence of opinions emphasized the intricacies of the IIOJK issue within global politics. Pakistan has maintained a consistent stance throughout this process, focusing on a diplomatic solution. It has called for international intervention, highlighting dialogue and the inclusion of Kashmiri representatives in the process to ensure a just and lasting resolution that respects the aspirations of the Kashmiri people while prioritizing regional peace and stability.

In the months following the abrogation of both articles, China, Iran, Malaysia, and Turkey voiced their concerns about the inhumane activities in IIOJK.²³ There are numerous reasons for most states' muted response to this

²¹“China Calls Article 370 Move ‘Illegal, Invalid’ Again, India Says China Has No Locus Standi,” *Wire*, August 5, 2020, <https://thewire.in/diplomacy/article-370-anniversary-china-illegal-india-locus-standi>.

²² Elizabeth Roche, “Article 370: Most Countries Back Indian Government’s Move Article 370: Most Countries Back Indian Government’s Move,” *Mint*, August 6, 2019, <https://www.livemint.com/politics/news/article-370-most-countries-back-indian-government-s-move-1565101524956.html>.

²³ Vivek Kumar Mishra, “The Abrogation of Article 370 International Reactions,” *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29, <https://www.jstor.org/stable/27003440>.

issue, and why the criticism has been largely ineffective in exerting any pressure on the Indian government to reconsider its unilateral actions.

China has emerged as a formidable rival to the US in the current geopolitical landscape. Over the past years, China has achieved significant progress, whether it is in strengthening its military, advancing technologically, or boosting its GDP and monetary flow. China has positioned itself as a significant contender for global leadership, causing concern for the US. The US is particularly worried about China's growing influence in the region.²⁴ To counter this influence and balance the power dynamic, the US sees India as a crucial ally that can act as a dependable counterforce against China's assertive expansion.²⁵

Since August 5, 2019, Pakistan tried to get the support of China, Malaysia, and Turkey.²⁶ Apart from these states, the focus of various other nations shifted towards addressing the stability in IIOJK,²⁷ rather than giving primary attention to altering its constitutional status. The legality of India's amendment to Article 370 was not at the forefront of their concerns.

Mapping the Responses

▪ *Silent Endorsement from the Western Nations*

As noted above, the international response to this illegal unilateral action of India is according to the relative power/ and place of both India and Pakistan in the international system. India has deepened alignment with the US-led West in the present great-power competition with China, whereby, political, economic and military cooperation between India and Western nations has

²⁴ David Brown, "Why China Could Win the New Global Arms Race," *BBC News*, July 28, 2022, <https://www.bbc.com/news/world-asia-china-59600475>.

²⁵ Michael Schuman, "What Limits Any U.S. Alliance with India over China," *Atlantic*, March 1, 2023.

²⁶ Vivek Kumar Mishra, "The Abrogation of Article 370 International Reactions," *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29, <https://www.jstor.org/stable/27003440>.

²⁷ *Ibid.*

expanded. At the diplomatic level, this has translated into both India and the West supporting each other's core interests. Thus, when Pakistan makes a push to present its case, it faces limitations due to Indian alignment with the West. The response from the international community is more aligned towards their own national interest rather than an endorsement of Indian hegemony in South Asia.

Then US President Donald Trump took a neutral stance and showed his willingness to act as a mediator to organize a mutual dialogue between both countries to come to a consensus on the Jammu and Kashmir issue.²⁸ Much of the limited criticism was seen from the opposition as Joe Biden said in his "Agenda for Muslim-American Communities" that "the Indian government should take all necessary steps to restore rights for all the people of Jammu and Kashmir" and criticized the restrictions imposed in the Valley as the "weakening" of democracy.²⁹

The UK's reaction was nearly identical to that of the US. Boris Johnson, Prime Minister of the United Kingdom, spoke with Prime Minister Narendra Modi and reiterated his belief that the problem should be resolved bilaterally between the two countries through talks.³⁰ There was noticeable criticism, particularly from British Muslim MPs from the opposition on the official response from the UK, who urged Boris Johnson to strongly condemn India's actions and portray India's behavior as inhumane, carrying out

²⁸ Saloni Kapur, "Kashmir: Why Trump's Offer of International Mediation Is a Good Idea," *Conversation*, December 22, 2022, <https://theconversation.com/kashmir-why-trumps-offer-of-international-mediation-is-a-good-idea-129112>.

²⁹ "Biden Will Play Role in Resolving Kashmir Issue," *Express Tribune*, January 5, 2021, <https://tribune.com.pk/story/2278816/qureshi-hopes-joe-biden-will-play-role-in-resolving-kashmir-issue>.

³⁰ Pti, "U.K. Pm Boris Johnson Tells PM Modi Kashmir a Bilateral Issue, Calls for India-Pakistan Dialogue," *Hindu*, August 21, 2019, <https://www.thehindu.com/news/international/uk-pm-boris-johnson-tells-pm-modi-kashmir-a-bilateral-issue-calls-for-india-pakistan-dialogue/article29212806.ece>.

atrocities against innocent Kashmiris.³¹ However, their efforts saw limited success in September 2019, in the form of a formal resolution passed, favoring international intervention and a UN-led referendum in Jammu and Kashmir.³²

Other major global powers also displayed a notably measured stance regarding India's actions, hesitating to openly condemn the reported atrocities in Jammu and Kashmir. For example, President of France, Emmanuel Macron, expressed his intent to closely monitor the human rights situation in the region while emphasizing that Paris would carefully observe any indications of human rights violations.³³ Simultaneously, the official stance from the French officials highlighted the belief that this issue should be resolved through bilateral discussions between Pakistan and India.

Similarly, Germany concurrently expressed genuine concerns for human rights.³⁴ This approach conveyed that Berlin would actively work to uphold human rights standards in the area while avoiding direct condemnation of India, as such an action could potentially strain diplomatic relations. This careful balancing act illustrates how these countries, while acknowledging their commitment to human rights, also prioritizes maintaining diplomatic ties. When Pakistan urged for a strong stance, Germany and other countries like the US, France, Britain, and Russia refused.³⁵

The European Union's reaction closely paralleled that of other key players, with its former Foreign Minister Federica Mogherini emphasizing the

³¹ William James, "Britain's Johnson Offers Qualified Apology for Islam Remarks," *Reuters*, May 25, 2021.

³² Vivek Kumar Mishra, "The Abrogation of Article 370 International Reactions," *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29, <https://www.jstor.org/stable/27003440>.

³³ Muhammad Saleh Zaafir, "Solution to Kashmir Issue: India Should Hold Talks with Pakistan, Says Macron," *The News*, August 24, 2019.

³⁴ Islamuddin Sajid, "Germany expresses concerns over Kashmir situation," *Anadolu Agency*, March 14, 2019, <https://www.aa.com.tr/en/asia-pacific/germany-expresses-concerns-over-kashmir-situation/1418031>

³⁵ Vivek Kumar Mishra, "The Abrogation of Article 370 International Reactions," *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29.

vital role of constructive dialogue between the two countries. She underscored the urgent requirement to lift the restrictions impacting the people in Jammu and Kashmir and stressed the imperative of reinstating their fundamental freedoms. This position highlights the EU's commitment to peaceful conflict resolution while acknowledging the crucial aspect of preserving the rights and liberties of the affected populace.³⁶ There has been no official statement from human rights upholders after 2019 that uprightly condemns the act of India.

▪ ***Anti-India Voices in the International Community***

The primary sources of limited criticism and resistance against India's actions predominantly stemmed from Pakistan and China. Both of these states openly protested against inhumane treatment of Kashmiris in IIOJK. In direct response to these developments, Pakistan, acutely affected by the situation, followed a predictable course of action. Then Prime Minister Imran Khan articulated India's actions as "illegitimate and unilateral," taking a solid stance, labelling them as a "crime against humanity." In a significant diplomatic move, Pakistani Foreign Minister of the time Shah Mahmood Qureshi, in his address to the UN Human Rights Council in September 2019, raised concerns about the potential for an inadvertent escalation, categorizing India's actions as a genocidal situation.³⁷

Diplomatic relations between Pakistan and India witnessed a significant downgrade in few days. Pakistan expelled the Indian High Commissioner, recalled its envoy from India, and suspended bilateral trade.³⁸ Pakistan raised the matter on the international stage, primarily seeking attention from the UNSC, with the backing of China. Although Pakistan

³⁶"EU Urges India to Restore Kashmiris' Rights," *Express Tribune*, September 2, 2019, <https://tribune.com.pk/story/2047916/eu-urges-india-restore-kashmiris-rights>.

³⁷ "Pakistan PM Imran Khan Will Forcefully Raise Kashmir Issue at Unga: Shah Mahmood Qureshi," *India Today*, August 28, 2019.

³⁸ "Article 370 Revoked: Pakistan Expels Indian Envoy, Suspends Bilateral Trade," *Business Standard*, August 7, 2019.

achieved minor successes in confidential UNSC meetings, no substantial victories or official UN statements were made against India. Most criticism has been directed at India, urging it to ameliorate the human rights situation in the region—a concern that extends beyond India alone to include Pakistan.³⁹

Pakistan also found strong support from Muslim-majority countries sharing amicable relations with Islamabad, notably Malaysia, Turkey, and Iran. Malaysian Prime Minister at the time Mahathir Mohamad explicitly conveyed concerns, saying India had “invaded and occupied” Jammu and Kashmir.⁴⁰ The Turkish Foreign Ministry cautioned about adjustments to Article 370, indicating potential repercussions on the current regional climate. Turkey maintained this standpoint over the subsequent year, observing that India’s actions had “further impacted the regional scenario” and had not “contributed positively to the stability of the area.”⁴¹ Iran’s leader, Ali Khamenei, extended his backing, urging India to reevaluate its actions and adopt a balanced approach to safeguard the welfare of the local population in the IIOJK.⁴²

However, the most noticeable response came from from Middle Eastern leaders, facilitated by the commencement of the Organization of Islamic Cooperation (OIC).⁴³ In the virtual meetings held at these conferences, a formal declaration was made, demonstrating support for the Kashmiris and calling on India to reverse its independent actions in the area. Nevertheless,

³⁹ *Ibid.*, 121.

⁴⁰ App, “Mahathir Urges Ways to Solve Kashmir Dispute,” *The News*, October 8, 2019, <https://www.thenews.com.pk/print/538652-mahathir-urges-ways-to-solve-kashmir-dispute>.

⁴¹ Web Desk, “Erdogan Highlights Kashmir Issue in UN General Assembly,” *Nation*, September 19, 2023, <https://www.nation.com.pk/20-Sep-2023/erdogan-highlights-kashmir-issue-in-un-general-assembly>.

⁴² “Iran’s Khamenei Urges India to Adopt Just Policy towards Kashmiris, Prevent Oppression of Muslims,” accessed July 15, 2024, <https://www.geo.tv/latest/245476-irans-khamenei-urges-india-to-adopt-just-policy-towards-kashmiris-prevent-oppression-of-muslims>.

⁴³ Vivek Kumar Mishra, “The Abrogation of Article 370 International Reactions,” *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29.

the OIC's reaction was confined to verbal disapproval and did not lead to concrete actions against India. This lack of concrete actions demonstrated the ineffectiveness of diplomatic avenues in exerting significant pressure on India.⁴⁴

▪ ***India - too valuable to Ignore***

Most countries responded with complete silence or expressed concerns solely about the humanitarian situation in IIOJK, showing little interest in the legal aspects of the issue. This widespread silence can be attributed to the considerable importance of India in global affairs, leading New Delhi to avoid open criticism for safeguarding diplomatic and economic relations with other nations. India has effectively established itself as a vibrant global economy in recent years.

Indian trade with the US was estimated \$191.8 billion in 2022. Its exports were \$73.0 billion and imports were \$118.8 billion.⁴⁵ Furthermore, when the rules governing IIOJK were being changed, India and France were discussing a multibillion-dollar agreement for Rafale fighters. In addition, the silent posture of the UAE and Saudi Arabia can be better understood in light of India's bilateral trade.⁴⁶ Significant investments in oil projects were also underway during this period. The UAE government conferred the highest civilian award, the Order of Zayed, to Indian Prime Minister Modi upon his arrival in the Emirates on 24 August 2019.⁴⁷

Furthermore, over the past years, India has crafted an image as one of the world's largest democracies, successfully shaping the narrative that the

⁴⁴ Ibid.

⁴⁵ "India- India Trade and Investment Summary," United States Trade Representative, accessed July 24, 2024.

⁴⁶ "India-GCC Bilateral Trade and Investment Trends," *India Briefing News*, October 11, 2023, <https://www.india-briefing.com/news/india-gcc-trade-and-investment-trends-25746.html/>.

⁴⁷ Vivek Kumar Mishra, "The Abrogation of Article 370 International Reactions," *Indian Journal of Asian Affairs* 33, no. 1/2 (2020): 120–29, <https://www.jstor.org/stable/27003440>.

IIOJK issue is a “domestic matter” to be resolved internally by India. This carefully managed image has significantly contributed to projecting the perspective that the IIOJK situation should remain a domestic concern.

Threats to Regional Stability

The intensity and magnitude of IIOJK dispute is not understood by many states. Iftikhar Durrani, a political commentator, contends that the ongoing Jammu and Kashmir crisis constitutes a substantial menace to global peace and security on a scale not witnessed since the aftermath of World War II.⁴⁸ The IIOJK dispute represents a significant threat to regional peace and stability in South Asia. Both Pakistan and India possess nuclear weapons, rendering them nuclear-armed nations. Consequently, the persistent conflict over IIOJK raises grave concerns about a potential nuclear confrontation, carrying catastrophic consequences for the two countries and the entire region.⁴⁹ As Pervez Musharraf, former President of Pakistan, astutely noted, ‘Jammu and Kashmir is the most dangerous conflict zone in the world today. It poses the risk of nuclear conflict escalation between India and Pakistan.’ Numerous instances have illustrated how ongoing tensions regarding IIOJK have resulted in cross-border violence, violating the LoC agreement, and significant civilian casualties.⁵⁰

The Indian unilateral actions enhance potential for escalation. India is using military power to suppress the voices of Kashmiri people; however, this policy is not sustainable, and Kashmiri people are likely to resist. India might

⁴⁸ Iftikhar Durrani, “Kashmir Crisis: Threat to World Peace & Challenge to Human Conscience,” *ANKASAM* | Ankara Center for Crisis and Policy Studies, September 12, 2019, <https://www.ankasam.org/kashmir-crisis-threat-to-world-peace-challenge-to-human-conscience/?lang=en>.

⁴⁹ Mobeen Jafar Mir, Pakistan Kashmir Strategy: An assessment and future outlook, February 10, 2021, <https://ipi.org.pk/wp-content/uploads/2021/09/Pakistan-Kashmir-Strategy.pdf>.

⁵⁰ “Musharraf Solution to Kashmir Issue,” *History Pak*, September 29, 2020, <https://historypak.com/musharraf-solution-kashmir-issue/>.

blame it on Pakistan, which could increase the risk of escalation between India and Pakistan. This dynamic exacerbates instability in IIOJK and extends to broader region, as both Pakistan and India are nuclear powers.⁵¹

Indian unilateral actions in IIOJK and refusal to resolve the IIOJK issue put pressure on Pakistan to spend on its defense despite multiple economic challenges. India's heavy investment in the defense budget pushes Pakistan to invest resources in defense and modernize its army. Furthermore, due to Pakistan's stance on the Kashmir issue, India is supporting terrorist groups, which carry out attacks inside Pakistan.⁵² These attacks not only kill innocent people, but also make it challenging to bring foreign direct investment to Pakistan.

Post-Kashmir Assembly Election Situation

The recent elections in IIOJK dealt a significant blow to the BJP, with the Congress-National Conference alliance securing a majority by winning 49 out of 90 seats.⁵³ The National Conference claimed 42 seats, the Congress 06, and the Communist Party of India (Marxist) 01, while the BJP managed only 29 seats. This outcome is seen as a public rejection of Indian Prime Minister Narendra Modi's policies in Kashmir, particularly the 2019 revocation of Article 370, which stripped the region of its special status.⁵⁴

Moreover, after these elections, the new assembly passed a resolution, asking the Indian government to take back revocation of Article 370. "This assembly calls upon the government of India to initiate dialogue with elected

⁵¹ Agnieszka Kuszewska, "The India-Pakistan Conflict in Kashmir and Human Rights in the Context of Post-2019 Political Dynamics," *Asian Affairs* 53, no. 1 (2022): 198–217, <https://doi.org/10.1080/03068374.2022.2041288>.

⁵² Global Times, "GT Investigates: Evidences, Sources Prove India 'supports Terrorism' in Pakistan's Balochistan - Global Times," accessed July 25, 2024.

⁵³ The News, "IIOJK Elections," *The News*, 2024, <https://www.thenews.com.pk/print/1238479-iiokj-elections>.

⁵⁴ *Ibid.*

representatives of people of Jammu and Kashmir for restoration of special status.”⁵⁵ Before this election, serious concerns were raised by the international organizations. Amnesty International said, “the government of fostering a climate of fear and urged an end to arbitrary detentions under strict anti-terror laws used to silence dissent on Jammu and Kashmir.”⁵⁶ While the election reflects resistance to Modi’s oppressive tactics, the broader plight of Kashmir remains unchanged. The region continues to endure human rights abuses, arbitrary detentions, and censorship under Indian occupation. Despite the significance of the election, it does not address the fundamental issues of freedom and dignity for the Kashmiri people.

Furthermore, the Indian government is trying to show that there is normalcy in IIOJK. However, Washington Post in an article revealed that it is far from the truth. One of the interviewees told Washington Post, “in previous elections, people would not vote out of anger and fear. Now, people are coming to vote driven by fear and anger.”⁵⁷ Another Interviewee said, “the establishment interpretation is that they are coming out in such droves because democracy has been restored. Nothing could be further from the truth. The voter turnout is a keen realization of the fact that enough is enough.”⁵⁸

Policy Options for Pakistan

Although Pakistan has consistently raised its voice against the atrocities in various forums, the extent of its success in effecting change since the abrogation of these laws has been limited. Pakistan’s response to the post-

⁵⁵ “Kashmir Assembly Passes Resolution Asking India to Restore Special Status,” *Al Jazeera*, 2024, <https://www.aljazeera.com/news/2024/11/6/indian-kashmir-assembly-issues-resolution-demanding-restoration-of-autonomy>.

⁵⁶ Arunoday Mukharji, “Kashmir Hopes for a Voice for Its Woes after Election,” *BBC News*, 2024, <https://www.bbc.com/news/articles/cx20rr57g16o>.

⁵⁷ Karishma Mehrotra and Shams Irfan, “In a ‘New Kashmir,’ Anger over Indian Repression as Elections Are Held - The Washington Post,” *Washington Post*, 2024.

⁵⁸ *Ibid.*

elections' developments in IIOJK must be multifaceted, focusing on diplomatic, legal, and strategic measures. Conversely, India has justified its actions in Jammu and Kashmir as essential steps for the region's development and integration within the larger Indian framework. Such narrative has to be countered by Pakistan at all forums. The following steps/policies on the part of Pakistan are pertinent in addressing the situation:

- Pakistan should leverage artificial intelligence and data analytics to track and expose human rights violations in IIOJK.
- Pakistan must develop a robust policy approach and prioritize the necessary measures to frame the reality of Jammu and Kashmir dispute and to combat the false allegations by India.
- Pakistan must prioritize its economic development and trade, as a strong economy that benefits other nations likely to enhance its global standing and amplify its voice.
- Pakistan should look at how it may engage India in International Court of Justice. The recent case of South Africa against Israel could be taken as an example in this regard.⁵⁹
- Integrate cutting-edge technology such as virtual reality to create immersive experiences that depict the realities of life in IIOJK, offering global audiences a firsthand understanding of the region's plight.
- Pakistan can establish an international digital platform where Kashmiri youth can share their stories, cultural heritage, and aspirations for self-determination, creating a narrative that counters Indian propaganda.

⁵⁹ Tahir Mahmood Azad and Haseeb Ur Rehman Warrich, "Media as an Instrument of Hybrid Warfare," *Global Mass Communication Review* 2021, https://www.researchgate.net/publication/351775179_21_media_as_an_instrument_of_hybrid_warfare.

- Pakistan should form strategic alliances with South Asian environmental organizations to address ecological challenges exacerbated by military activities in IIOJK, linking them to broader concerns of regional stability.
- Pakistan must collaborate with think tanks and international experts to publish annual reports on the political, economic, and social disenfranchisement of Kashmiris under Indian policies, reinforcing the illegitimacy of India's actions.

Conclusion

The abrogation of Article 370 and 35-A by India in August 2019 has had profound and wide-ranging repercussions for geopolitics, regional peace, and human rights in the Jammu and Kashmir region. These actions are not just confined to the region of IIOJK; in fact, they have escalated tensions between Pakistan and India, which possess nuclear capabilities. This conflict gets global attention because the consequences of this extend far beyond the borders of these two nations, affecting regional stability and global alliances. The recent elections in IIOJK Assembly and developments which happened after them have added new dynamics in Kashmir issue. Kashmiri people have rejected BJP in recent elections and new assembly also passed a resolution for regions' autonomy. In this situation, Pakistan should not let India silence the Kashmiri voices. It should raise Kashmiri voices on international forums. However, despite the gravity of the situation in IIOJK, international responses have been influenced by geopolitical and economic considerations. India's growing role in the global economy has prompted many nations to prioritize their diplomatic ties with India, sometimes overshadowing concerns about human rights. However, on the other hand, the step taken by India has created opportunity for Pakistan to address the issue according to its national interest. Indian attempt has unfrozen the conflict and Pakistan should not hesitate to

use this unfreezing moment to gain more benefit out of it. Pakistan needs a very comprehensive and detailed policy to address the multifaceted issue. It must include renewed diplomatic policies, media engagement and rigorous advocacy campaigns on international fora. Adopting consistence stance on the IIOJK dispute, Pakistan must also underscore the importance of soft power like strategic communications and dialogue in resolution of this longstanding dispute to bring regional peace and stability. Pakistan should understand that it is time to reshape the policy from hard power to soft power. A just and peaceful solution, according to the wishes of Kashmiri people with engagement of all the relevant stakeholders remains a formidable challenge for Pakistan.