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CONTENTS

South Asia in Transition: Strategic Landscape and Regional Order

Mazhar Jamil*

Abstract

The strategic landscape of South Asia is largely defined by the balance of power dynamics between two nuclear-weapon states, i.e., India and Pakistan. The historically contentious relationship between India and its neighboring states also influences the security dynamics of this region. Instead of focusing on peace through cooperative frameworks, South Asia often contends with a zero-sum security approach. Alongside, India's ambitions for regional hegemony and its aspirations for a great power status have further undermined the potential of this region. Under the current leadership of the Bharatiya Janata Party (BJP), the emergence of a Hindutva-inspired ideology, along with the conceptualization of Bharat as a Hindu Rashtra, has significantly transformed the security landscape of South Asia, thereby making it more complex and volatile. India's ideological shifts, accompanied by a revisionist historical narrative, coupled with a false sense of conventional superiority and hegemony, have begun to undermine regional peace and stability in an unprecedented way. This paper aims to assess how India's evolving strategic thought is influencing the regional security environment, peace, and stability. Additionally, the paper explores how Pakistan can respond to these developments as a responsible nuclear-weapon state. It also offers possible avenues for mutual strategic restraint to maintain peace and stability in the region.

Keywords: South Asia, Indian Strategic Thought, Hindutva-inspired Ideology, False sense of Hegemony, Strategic Stability.

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Introduction

The strategic landscape of South Asia is mainly defined by the balance of power equation between two nuclear-weapon states, i.e., India and Pakistan. India's conflictual relationship with its other bordering states is also becoming a perpetual driver of the evolving security dynamics of South Asia. Instead of focusing on achieving peace through cooperative frameworks and regional integration, South Asia is plagued by the zero-sum security paradigm, which is fueled by Indian ambitions for regional hegemony and status-driven global aspirations. The foreign policy of India has been marked by efforts to achieve political and military supremacy over its neighbors, which has been inconsistent with the focus of other South Asian states on economic integration, regional connectivity, and peaceful coexistence.[1]

In recent years, political transformation, led by the Hindutva doctrine of aggression in India, has introduced additional layers of complexity to the regional security environment. The rise of a Hindutva-inspired ideology under the present leadership of the BJP in New Delhi marks a significant shift towards a nationalism prejudiced by theological principles. This advancement has led to an acceptance of the identity of Bharat as a Hindu Rashtra, or Hindu nation. Such ideological transformations, coupled with its history driven by revisionist ambitions, have begun to shape India's broader strategic behavior. This evolution poses grave challenges to the peace and stability of South Asia.[2]

The security environment of South Asia is also complex due to its connection with the extended or extra-regional geopolitical theaters. The geographic proximity of the region to the Asia-Pacific and the Middle East implies that any activity of the great powers in these regions trickles down to South Asia.[4] For example, the strategic rivalry between the US and China

[1] Sardar Jehanzaib Ghalib and Muhammad Ahmad Khan, "Dominance via Diplomacy: Analyzing India's Assertive Regional Strategy in South Asia," *Journal of Security & Strategic Analyses* 11, no. 1 (2025): 29–47, https://doi.org/10.57169/jssa.0011.01.0352

[2] Zahir Kazmi, "Sindoor to Strategic Folly: India's Risky Escalation Doctrine," *Center for International Strategic Studies (AJK)*, May 9, 2025, https://cissajk.org.pk/2025/05/09/sindoor-to-strategic-folly-indias-risky-escalation-doctrine/

in the Asia-Pacific region has provided India with an opportunity to project power in broader Asia, thereby positioning itself as a Net Security Provider aligned with US interests to offset China's growing wealth and power. In this process, this Western-sponsored label has cultivated in the Indian leadership an overconfidence and a false sense of hegemonic impunity in South Asia. This means New Delhi perceives its smaller neighbors in a center-periphery framework, with India being the central power and other countries compelled to conform to its demands. Any independent action of a neighboring state is construed in Indian strategic thought as disobedience and not a national interest.

Similarly, continued conflicts in the Middle East and instability in Afghanistan also spill over to South Asia, with India taking advantage of the unrest in Afghanistan by funding anti-Pakistan militant groups like the Tehrik-Taliban Pakistan (TTP) and the Balochistan Liberation Army (BLA).[3] These are the sources of strategic transformation in South Asia.

More so, global ongoing destabilization, such as war-fighting trends, the turbulent situation in Eastern Europe, the ongoing turmoil in the Middle East, developed states' growing reliance on modernization of military capabilities, fading arms control culture, and eroding non-proliferation norms, have emboldened India's false sense of superiority and a pathway to its own force modernization. The world trends hence confirm the Indian philosophy of the primacy of hard power as the means of security. Where global powers themselves defy rules or are too distracted by bigger crises, India finds a freer hand to pursue its revisionist hegemonic ambitions in the region. The strategic behavior of India, being patronized by great powers, is increasingly becoming an anomaly, contradicting rational statecraft and undermining the stability of this region.

Based on the above rationale, this paper examines the impact of India's Hindutva-driven ideology on the strategic landscape of South Asia. This paper discusses how India's false sense of hegemony and superiority towards its neighboring states and the country's growing abnormality, laced

[3] "BLA and TTP Are Indian Proxies, Govt Will Prove India's Involvement in Khuzdar Bus Attack: Asif," *Dawn*, May 22, 2025, https://www.dawn.com/news/1912572

with its coercive actions in the region, have become a renewed challenge to regional stability. The paper subsequently offers guidelines on how Pakistan should respond to these growing regional developments as a responsible nuclear-weapon state. Finally, the paper proposes pathways to secure regional peace and maintain mutual strategic restraint.

Manifestation of Hindutva Ideology and Changing Regional Landscape

The ideology of governance in India is drastically changing to a Hindu nationalist system with spillover effects in its neighboring countries. India is now proudly practicing a Hindu nationalistic ideology under the BJP-led government, which aims to transform India into a Hindu Rashtra (Hindu nation).[4] This is an exclusionary vision founded on the Rashtriya Swayamsevak Sangh (RSS) ideology of Savarkar and Golwalkar, which describes India as a Hindu cultural nation. This has, in practice, taken the form of a majoritarian, supremacist power that aspires to place religious minorities in a second-class position.[5] The RSS, which is the ideological guiding tool of the BJP, enjoys an immense network and is now ruling the education, culture, and security policy of India.[6] In short, current leadership in India is functioning, seeking spiritual guidance of a sectarian Hindutva vision that explicitly states that India is a Hindu Rashtra, which casts fundamental doubts on its ability to uphold regional plurality.

The strategic thinking in India has taken the form of an assertive and structurally destabilizing regional posture. This is not an impulsive aberration, but the rational outlook of a strategic culture based on a hegemonic notion. The policy espoused by India views South Asia as a hierarchy that should be managed, rather than a cooperative security region that fosters progressive peace leading to prosperity. India aspires to achieve

[4] Mayank Kumar, "India a 'Hindu Rashtra', 'Akhand Bharat' Will Come True, Says Yogi Adityanath," *The Hindu*, February 16, 2023, https://www.thehindu.com/news/national/other-states/india-a-hindu-rashtra-akhand-bharat-will-come-true-says-yogi-adityanath/article66512640.ece

[5] Muhammad Ahmad Khan, *Rewriting History: India in Pursuance of Hindu Rashtra*, Issue Brief (Islamabad: India Study Centre, Institute of Strategic Studies Islamabad, June 20, 2023), https://issi.org.pk/wp-content/uploads/2023/06/IB_Ahmad_June_20_2023.pdf.

[6] Snigdhendu Bhattacharya, "The RSS at 100: The Pan-Hindutva Force Behind Modi's BJP," *The Diplomat*, September 2025, https://thediplomat.com/2025/09/the-rss-at-100-the-pan-hindutva-force-behind-modis-bjp/.

a dominant position in line with its self-image of a great power. In this pursuit, India attempts to manipulate or undermine other states in the region so that its regional dominance is preserved and sustained. This kind of posture is bound to jeopardize the security of the neighbors, which will cause instability and undermine prospects of cooperation among other regional states.

In conceptual terms, the Indian strategic thought appears to struggle to internalize the notion of sovereign equality in the region. New Delhi tends to view its smaller neighbors through a center-periphery lens, positioning itself as the dominant player in the region, while regarding the other countries as subservient to its policy directives. Any independent act of a neighboring state is construed in Indian strategic thought as defiance and not a national interest. Notably, this is the reason why India favors unilateralism, denies bilateralism, and disregards multilateralism.

Counting on the manifestation of Hindutva doctrine, it is pertinent to refer to four interwoven strands that have become the strategic guiding posts for New Delhi to operate in the region. First is the revisionist Hindu Ideology. This means the ruling elite in India has turned to an alternative form of historical revisionism that envisages a Greater Bharat.[7] It openly aims at redefining India as a Hindu Rashtra, disregarding the interests of minorities, based on its secular, pluralist heritage. Intellectuals belonging to the Hindutva school of thought have always believed that India is a unitary nation of a single culture, i.e., Hinduism. This worldview supports irredentist ambitions like the unification of all of Hindustan under a single religion. Indeed, RSS ideology explicitly presents India as a Hindu society that is on the verge of decline and demands to restore its alleged ancient glory. Strategically, it translates to overcoming historical losses (between medieval and colonial rule) and dominating weaker neighbors, an attitude that is occasionally likened to the Matsya Nyaya (big fish) law of the Arthashastra of Kautilya.[8] Kautilya himself advised that violence should be

[7] Christophe Jaffrelot, *Modi's India: Hindu Nationalism and the Rise of Ethnic Democracy* (Princeton: Princeton University Press), 2021.
[8] Prerana Thakur, "The Hindu Philosophy of Matsya Nyaya and its Contemporary Relevance," *Pratha: The Indian School of Cultural Studies* (blog), July 20, 2023,

used as a last resort when diplomatic efforts are depleted. Such caution is, however, sidelined by the current Hindutva-led policy makers.[9] The current government intensifies civilizational exceptionalism, the notion that India must be at the forefront by gaining primacy in South Asia.

Second is militarized aggression. This ideology is associated with aggressive strategic positioning. The world witnesses the deployment of the Indian military force and coercion in the Indian Illegally Occupied Jammu & Kashmir (IIOJ&K).[10] India's use of force, its illegitimate actions there, and violation of human rights in the disputed territory of IIOJ&K are reported worldwide. For example, UN-based human rights experts have written reports[11] on the Indian human rights violations,[12] including arbitrary arrests, detentions, and disproportionate restrictions on free expression[13] in IIOJ&K. With Pakistan, on many occasions, India disregarded nuclear deterrence as no obstacle to strategic coercion and brinkmanship. India's aggressive strategic position has been validated by its war-waging behavior as well as its war-fighting and offensive doctrine of limited war, i.e., Cold Start (also known as Proactive Operations - initiated in 2004),[14] as demonstrated in recent events such as the 2019 Pulwama-Balakot crisis and the May 2025 conflict with Pakistan[15] after the Pahalgam incident (discussed below). This indicates that India's abnormality as an irresponsible nuclear state will continue to intensify.

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https://www.prathaculturalschool.com/post/the-hindu-philosophy-of-matsya-nyaya-and-its-contemporary-relevance

[9] Vinay Vittal, *Kautilya's Arthashastra: A Timeless Grand Strategy* (Maxwell Air Force Base, AL: Air Command and Staff College, Air University, 2016), https://apps.dtic.mil/sti/pdfs/AD1019423.pdf

[10] "UN Experts' Findings on Human Rights Violations in Indian Illegally Occupied Jammu and Kashmir," *Ministry of Foreign Affairs, Government of Pakistan*, November 26, 2025, https://mofa.gov.pk/press-releases/un-experts-findings-on-human-rights-violations-in-indian-illegally-occupied-jammu-and-kashmir

[11] Ibid

[12] Ibid

[13] Ibid

[14] Jaweria Faisal, 'Calibrated Escalation: India's Doctrinal Evolution and the Stability–Instability Paradox,' *Issue Brief* (Islamabad: Institute of Strategic Studies Islamabad, October 3, 2025), https://issi.org.pk/issue-brief-on-calibrated-escalation-indias-doctrinal-evolution-and-the-stability-instability-paradox/.

[15] Shams uz Zaman, India's Limited War Fighting Doctrines and the May 2025 Provocation: Challenges to Deterrence and Stability in South Asia. (2025). *Strategic Thought*, *7*(1), 55-0. https://strategicthought.ndu.edu.pk/index.php/site/article/view/118

The third strand is Disinformation, Deceit, and Deception. This encompasses the use of propaganda, deception, and cyber warfare tools systematically to cause Pakistan reputational damage. Indian state and its media houses have launched synchronized information campaigns to influence the domestic and international perceptions by aligning Pakistan with the phenomenon of terrorism. Staging false-flag terrorist attacks and subsequently, abruptly externalizing the blame to Pakistan has become a new abnormality in India. Indian major television channels[16] have been observed to air unverified claims, and social media influencers associated with the government have been running online platforms[17] to spread misinformation about Pakistan.[18] These maneuvers are reminiscent of the old school of strategic thought and refer to the principle of Maya (deception)[19] taught by Kautilya to justify covert action.

The fourth strand is evading multilateralism and defying international law. India's Hindutva-driven ideology has started undermining the efficacy of multilateralism, international law, and universal norms. In August 2019, India unilaterally revoked its constitutional articles 370 and 35A, altering the identity of the people of Kashmir, undermining the legal status of Kashmir, and violating the United Nations (UN) mandate.[20] Similarly, on many occasions, it has used war as an instrument to violate Pakistan's territorial sovereignty. Moreover, India has established a pattern of violating and unilaterally revoking bilateral regional agreements, often without consequence. A World Bank-brokered Indus Water Treaty (IWT), which allocated the waters of the Indus River system between India and Pakistan, giving India exclusive rights to the eastern rivers (Ravi, Sutlej,

[16] Wasim Qadri, Research: Indian Media Used 90% Fake News to Flare up Nuclear war**,** *Think Tank Journal*, May 14, 2025, https://thinktank.pk/2025/05/14/indian-media-used-90-fake-news-to-flare-up-indo-pak-nuclear-war/
[17] Ibid
[18] Muskan Moazzam, 'The Battle of Perceptions: India's Information Warfare against Pakistan,' *Issue Brief* (Islamabad: Institute of Strategic Studies Islamabad, June 5, 2025), https://issi.org.pk/wp-content/uploads/2025/06/IB_Muskan_Moazzam_June_5_2025.pdf
[19] Deepsikha Mohapatra and Abhisek Dash, "Beyond the Battlefield: The Arthashastra Paradigm for Hybrid Warfare," *International Journal of Humanities and Social Science Research* 11, no. 4 (2025): 60–63, https://www.socialsciencejournal.in/assets/archives/2025/vol11issue4/11082.pdf
[20] Permanent Mission of Pakistan to the United Nations, Geneva, 'UN Resolutions on Jammu & Kashmir,' Pakistan Mission to the UN, Geneva, UN Resolutions On Jammu & Kashmir – Pakistan Mission to the UN | Geneva

Beas) and Pakistan rights over the western rivers (Indus, Jhelum, Chenab). In April 2025**,** the Government of India put this treaty in "abeyance." Pakistan rejects the unilateral suspension of the agreement and considers diversion of water, which is its lifeline, as an act of war.

The hegemonic posture of India is not only extended to Pakistan but to all its neighbors, including those who have a long history of friendly relations, such as Bangladesh.[21] Indicatively, the case of Dhaka is an example of how coercion is integrated as a matter of regional policy in India.[22] However, in spite of rhetorically cordial relations and extensive economic interdependence, India has been continually lagging or evading fair deals with Bangladesh on water sharing and other important matters. One of such cases is the Teesta River accord, which has been pending for a long time. Bangladesh has been demanding a reasonable sharing of the waters of the Teesta over a period of more than ten years, but Indian politics killed a 2011 deal, and since then, New Delhi has not been able to finalize a treaty.[23] The Nepal case is another vivid example of how the coercive leverage of India can be counterproductive and turn the balance of power in the region. The Indian strategic culture had long regarded Nepal not as an equal sovereign state, but as a buffer state in the natural sphere of influence of India. This attitude was reflected in constant political meddling and economic blackmail in Indo-Nepal relations. Its lowest moment was reached in 2015 as India was widely accused of a silent blockade of fuel and other necessities into Nepal, which appeared to be a way of punishing Kathmandu over its new constitution that was not satisfactory to New Delhi. These two are only a few instances of how India, guided by a Hindutva-based strategic worldview, is increasingly becoming a self-declared regional policeman, forcing its neighboring states to adopt Indian preferences as regional rules and Indian interests as the default position in their foreign and security

[21] Samran Ali, "India in Its Neighborhood: Hegemonic Behaviour," *CISS Insight Journal* 4, no. 2 (2016), https://journal.ciss.org.pk/index.php/ciss-insight/article/view/14/13
[22] Ibid.
[23] Md. Mizanur Rahman, 'Water Sharing Geopolitics between India and Bangladesh: Recent Trends' *International Journal of Applied and Advanced Multidisciplinary Research*, *2* (8), (2024). 569–592. https://doi.org/10.59890/ijaamr.v2i8.2418

policies. Such actions reflect Kautilya's Danda principle (Coercion as Statecraft).[24]

Global Instability and Indian Mounting False Sense of Hegemony

The Indian mindset highlighted above is further emboldened in the backdrop of the evolving global power dynamics. With the current multipolar international system, India is aiming to take advantage of the great-power rivalry so as to retain its position as a regional hegemon and a preferred Western partner. The US and its partners have been quick to identify India as a Net Security Provider in the Asia-Pacific, without necessarily undertaking a stringent evaluation of the capacity and motives of New Delhi.[25] This western-sponsored label has cultivated in the Indian leadership an overconfidence and a sense of hegemonic impunity in South Asia. However, this perception has not been translated into prudent governance; instead, the strategic behavior of India, being patronized by great powers, is increasingly becoming an anomaly, contradicting rational statecraft and undermining the stability of the region.

The governing BJP has brought an extremist ideology into the state policy that glorifies ethnic majoritarianism and is not hesitant to use force. This has led to the rise of a strategic culture whereby violence is actively justified and used to achieve a false victory. As an example, the Indian leadership is becoming increasingly entrenched in the idea of exercising military power with impunity to threaten neighbours, an idea that Prime Minister Narendra Modi seems keen to normalize in South Asia. The political and ideological self-interest of this kind are often sought in the short term, at the domestic level, and are not connected with the restraint that a responsible state should possess. The rhetoric and brinkmanship of New Delhi, aimed at mobilizing the electorate domestically, violate the standards of responsible nuclear behaviour.

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[24] "The Coercive Power of the State in Kautilya's *Arthashastra*," *Indian Political Thought-I*, August 22, 2025, https://polsci.institute/indian-political-thought-l/coercive-power-state-kautilya-arthashastra/.

[25] Zahir Kazmi 'Challenges of Strategic Stability Amongst Littoral Powers of the Indian Ocean Region,' *CISS Insight Journal*, *11*(2), (2024), pp. 109-141, https://journal.ciss.org.pk/index.php/ciss-insight/article/view/345

This aberrant strategic reasoning is further supported by an ideology of civilizational exceptionalism. The RSS-BJP vision of "Akhand Bharat" (Greater India) promotes revisionism, seeking to reshape borders and dominate South Asia in accordance with a mythologized destiny. Falsehood and misinformation have been made a part of statecraft, and Indian strategists invented false histories to justify aggression. These practices that are ideologically intense weaken the mechanisms of rational policymaking. As a result, India is no longer behaving as a restrained, doctrine-bound, rational actor, but is now emerging as a revisionist power with extremist tendencies. The strategic behaviour of India can therefore be described as abnormal and destabilizing, driven by aggressive Hindutva revisionism and normalization of violence in policy.[26] This is compounded by the enabling environment that the Western allies of India are creating.

Another destabilizing trend boosting India's confidence is the intensifying US-China rivalry. As the West reorients to counter China's rise, India finds itself in an enviable position, courted as a pivotal ally in the Asia-Pacific strategy. The formation of groupings like the Quad (with the US, Japan, and Australia) and stronger defense ties with Europe are seen in India as evidence that the winds of international politics are shifting in its favor. Consequently, India has grown more confident in taking bold steps, whether it's fortifying its disputed border with China or abrogating Kashmir's autonomous status domestically, amid minimal international pushback. Notably, in the context of US-China rivalry, India has positioned itself as a counterweight to China, which earned it the informal Western designation of a regional "Net Security Provider."[27] India is playing deception here by adhering to a dual approach, engaging with both the US and China. While the US leverages China's rise as a potential threat to consolidate its own position and foster international alliances, India continues to maintain

[26] Government of Pakistan, Ministry of Foreign Affairs, "Pakistan Categorically Rejects the Statement by Senior BJP Leader and Chief Minister of Assam Calling for Hindutva's Expansionist Idea of So-Called 'Akhand Bharat,'" press release, https://mofa.gov.pk/pakistan-categorically-rejects-the-statement-by-senior-bjp-leader-and-chief-minister-of-assam-calling-for-hindutvas-expansionist-idea-of-so-called-akhand-bharat/

[27] Maheera Munir and Aiysha Safdar, "Sino–U.S. Strategic Competition in the Asia-Pacific: Omnidirectional Hedging of Traditional Middle Powers," *Strategic Studies* 43, no. 2 (Islamabad: Institute of Strategic Studies Islamabad, 2023), https://issi.org.pk/wp-content/uploads/2024/01/Maheera_Munir_and_Aiysha_Safdar_SS_No_2_2023.pdf

substantial bilateral trade with China and sustain energy and defense ties with Russia.

This foreign assurance serves as a blank cheque awarded by Washington and other allies, thus strengthening the Indian grandiose self-image. The Western powers rushed to extend this status of a regional enforcer to India, pursuant to their own geopolitical interests. The notion of India as a Net Security Provider, though, is only a pretense to legitimize New Delhi's ambitious, hegemonic ambitions, considering that India cannot plausibly promise security at the same time that it has conflictual relations with most of its neighbours and destabilizes them.

The sense of security created by Western patronage has led India to engage in a greater military build-up and coercion without the fear of consequences. Western profligacy has enabled a quick build-up of Indian military equipment, and it has now the fastest-growing nuclear and missile program[28] without a corresponding focus on arms control or regional stability. In line with this, New Delhi is increasingly willing to push the boundaries of escalation with the assumption that the West will back unilateralism. In fact, the US reactions towards the 2019 Pulwama-Balakot crisis and May 2025 Conflict have been an indication of support to India in its right to self-defence, thus emboldening the Indian government to use limited military power against Pakistan. The net result of this kind of encouragement is an India that feels secure behind the great-power association, a false feeling of impunity that reinforces its distorted strategic attitude. Interestingly, even those commentators who were inclined towards the Indian cause at the time wonder whether the so-called Net Security Provider status of India can be held any longer after the recent confrontations, which revealed the limitations of Indian dominance and the dangers of Indian overreach.

India's reckless posture as a nuclear-armed country is the most alarming aspect of its abnormal state behaviour. Through an extremist political

[28] Ghazala Yasmin Jalil, "Issue Brief on India's Nuclear Program: How Come It Is Not Seen as the 'Fastest Growing'?" *Institute of Strategic Studies Islamabad (ISSI)*, October 6, 2023, https://issi.org.pk/issue-brief-on-indias-nuclear-program-how-come-it-is-not-seen-as-the-fastest-growing/

leadership, India has been playing with nuclear brinkmanship and scowling moves that are practically inconceivable for a responsible nuclear power. The world has seen a preview of this in the 2019 Pulwama-Balakot conflict[29] and the May 2025 Conflict. In the midst of the mounting tensions, Indian leaders made provocative nuclear-tainted warnings rather than advice and calm. Prime Minister Modi bragged at an election rally that India was not storing its nuclear weapons for Diwali,[30] openly ridiculing the Pakistani deterrent. This rhetoric was extremely irresponsible, and this nuclear saber-rattling in pursuit of domestic political advantage violates the standards of responsible state conduct and endangers the South Asian strategic stability. Moreover, Modi outrageously called the night of 27 February 2019,[31] in the midst of the confrontation, Qatal Ki Raat (the night of murder), basically boasting about India could have struck Pakistan with missiles.[32] This confession went against previous Indian denials of any intended use of missiles, exposing the Indian leadership to the brink of the nuclear threshold.

The Prime Minister was not alone. The high-profile members of the Modi cabinet have also announced a disturbing rejection of nuclear restraint. In August 2019, the Indian Defence Minister speculated that the long-standing Indian nuclear policy of No First Use (NFU) could be conditional, depending upon the situation, placing a cloud over one of the foundations of nuclear policy.[33] This kind of rhetoric by the leadership of a nuclear-armed country undermines the delicate trust that prevents nuclear miscalculation. In addition, Modi and his senior officials have openly

[29] Center for International Strategic Studies, Islamabad, *Pulwama–Balakot Crisis*, CISS Special Issue, Islamabad, https://ciss.org.pk/PDFs/CISS-Special-Issue-Pulwama-Balakot-Crisis.pdf
[30] "Our Nuclear Weapons Are Not for Diwali, Modi Threatens Pakistan," *The Express Tribune*, April 21, 2019, https://tribune.com.pk/story/1956023/nuclear-weapons-not-diwali-modi-threatens-pakistan
[31] Zahir Kazmi, "Pulwama-Balakot Crisis Redux," *Strategic Vision Institute,* February 15, 2025, https://thesvi.org/pulwama-balakot-crisis-redux/
[32] Ministry of Foreign Affairs, Government of Pakistan, "Spokesperson's Remarks in Response to a Media Question Regarding Prime Minister Modi's Remarks on Indian Nuclear Capability," press release, Ministry of Foreign Affairs, Pakistan, https://mofa.gov.pk/spokespersons-remarks-in-response-to-a-media-question-regarding-prime-minister-modis-remarks-on-indian-nuclear-capability/
[33] Press Information Bureau, Government of India, "Shri Rajnath Singh Assumes Office as Defence Minister," press release, Ministry of Defence, Government of India, September 3, 2019, https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1573089&reg=3&lang=2

disregarded the nuclear capability of Pakistan, referring to it as a nuclear bluff, even threatening to disintegrate Pakistan into pieces, an outstandingly irresponsible display in a nuclearized standoff.

The posture of India indicates the unwillingness to accept strategic realities. Indian military planners have publicly speculated about waging and winning a conventional conflict with Pakistan under the nuclear threshold, encouraged by doctrines such as Cold Start. This belief is very destabilizing, with an inherent risk of uncontrolled escalation. The geographic proximity, short decision-time, and emotive conflicts (such as Kashmir) imply that any conflict, however small at its onset, threatens to turn into a full-scale crisis. The indisposition of India to abandon this coercive fantasy, which is basically an attempt to probe the limits of Pakistan in a nuclearized setting, remains a constant threat to the stability of the crisis in South Asia. South Asia is perhaps the most likely region in the world where the breakdown of deterrence would result in the use of nuclear weapons. It would be a direct consequence of the Indian hegemonic mentality that did not pay attention to the constraints of force in a nuclear environment.[34]

Eroding Non-proliferation Norms and Growing India's Abnormality

International treaties like the Nuclear Non-Proliferation Treaty (NPT) and the Comprehensive Nuclear-Test-Ban Treaty (CTBT) have been trying to contain the proliferation and use of nuclear weapons for decades. Those norms are quickly eroding. Major nuclear powers are modernizing or growing their arsenals, and unlike during the Cold War, the world's arsenal of nuclear warheads is increasing at a fast pace. The classical pillars of arms control between the US and Russia are crumbling, as demonstrated by the impending end of the New Strategic Arms Reduction Treaty (START) with no alternative on the horizon, thus diminishing confidence in the rules-based order. As US-Russia arms control agreements unravel, an atmosphere of strategic uncertainty prevails. The collapse of the Intermediate-Range Nuclear Forces (INF) Treaty in 2019, for instance, eliminated normative

[34] Ministry of Foreign Affairs, Government of Pakistan, "Statement by the Spokesperson Regarding Pakistan-Specific Reference in the India-US Joint Statement of 13 February 2025," press release, February 13, 2025, https://mofa.gov.pk/press-releases/statement-by-the-spokesperson-regarding-pakistan-specific-reference-in-the-india-us-joint-statement-of-13-february-2025/

limits on ground-launched missiles of the class India has been developing. The looming expiry of New START in 2026 with no alternative will remove the last cap on superpower arsenals. In this climate, global nuclear moderation norms are fading.[35]

India has been swift to gain confidence under these global trends. New Delhi has remained an outlier to the NPT and CTBT, but has been gradually broadening its strategic capacity and capabilities far beyond the previous claim of credible minimum deterrence (CMD). India no longer feels bound by the old non-proliferation taboos; it sees itself as an emerging great power that has the right to break traditional rules. This faith is seen in its rhetoric and behavior.[36] In September 2025, the Chief of Defence Staff of India candidly announced that India will not be nuclear blackmailed and that nuclear and radiological preparedness should be implemented as a part of national security.[37] These declarations are not part of normal deterrence signalling, but they are indications of a more aggressive attitude in which nuclear capabilities are seen not as weapons of last resort but as policy tools.

The inability of forums like the United Nations Security Council (UNSC) to act multilaterally has proved that might usually prevails. It is against this background that Indian leadership seems to believe that the old rules may no longer apply to the emerging powers like itself. The growing permissiveness of power politics in the world, whether through annexations or weaponization, encourages the belief of New Delhi that it can pursue maximalist strategic objectives - nuclear, conventional, or territorial - in the name of its own national interest. The increasing assertiveness of India, however, is not happening in a vacuum; it reflects a world where normative

[35] Naeem Salik, *Emerging Global Nuclear Dis-Order?* (Islamabad: Strategic Vision Institute (SVI), August 2023), SVI Monograph Series, no. 2, https://thesvi.org/wp-content/uploads/2023/09/SVI-Monograph-Series-No.-2.pdf

[36] Komal Khan, "Is Non-Proliferation a Regime of the Equals?" *Strategic Vision Institute*, August 18, 2025, accessed December 23, 2025, https://thesvi.org/is-non-proliferation-a-regime-of-the-equals/

[37] "India Will Not Be Deterred: CDS General Rejects Nuclear Blackmail, Calls for Bio-Threat Preparedness Post Op Sindoor," *Times of India*, September 30, 2025, https://timesofindia.indiatimes.com/india/india-will-not-be-deterred-cds-general-rejects-nuclear-blackmail-calls-for-bio-threat-preparedness-post-op-sindoor/articleshow/124226704.cms

consensus is rapidly dissolving, and projection of power is once again being used as a currency in international relations.

The once strong culture of the global non-proliferation regime is suffering, partly because of selectiveness in enforcement and expediency in geopolitics. A glaring example was the Nuclear Suppliers Group (NSG) waiver granted to India in 2008. Despite India not meeting core non-proliferation norms (it never joined the NPT or accepted full-scope safeguards of the IAEA), the NSG approved a country-specific exemption to allow nuclear trade with India. This exceptional NSG waiver, indeed directed by the political aspirations of great powers, mainly the US, created a double standard. India was offered the incentives reserved for NPT members, but without conforming to any corresponding obligations. It sent a message that adherence to global rules is negotiable. India's deal undermined the integrity of the non-proliferation regime and set a dangerous precedent for others seeking similar exceptions. Indeed, Pakistan pointed to the NSG's "exceptional treatment" of India as eroding global norms and immediately demanded equal recognition. From the US-India civil nuclear agreement onward, the world saw that non-proliferation principles could be bent for strategic considerations, a shift that diluted the once-strong culture of universal compliance.

India has aggressively modernized its nuclear and conventional forces, having been relieved of many external constraints. It has exploited its privileged position to bring in state-of-the-art technology and fuel to support its civilian reactors, which has, in turn, indirectly increased weapons potential by releasing its domestic resources to its arsenal. India is also not a signatory of the CTBT, only having a voluntary test moratorium, and therefore has no legally binding constraints about reinstating nuclear explosive testing at its will. At the Conference on Disarmament, work on the Fissile Material Cut-off Treaty (FMCT) has been stalled, due in part to the continued production of weapons-grade material by states like India to construct increasingly large stockpiles.

Meanwhile, India's force modernization is proceeding at a fast pace. According to the Stockholm International Peace Research Institute

(SIPRI),[38] India is one of the few states currently expanding its nuclear arsenal and developing new delivery systems. It has operationalized a nuclear triad of land, air, and sea-based capabilities and is investing in more advanced systems. Strikingly, recent data indicate that India has surpassed neighboring Pakistan in warhead count, possessing 180 warheads to Pakistan's 170 as of 2025.[39] This marks a significant shift in South Asia's strategic balance and highlights India's unabated buildup. New Delhi insists it still abides by "credible minimum deterrence," yet its current trajectory, qualitatively and quantitatively, far exceeds any reasonable definition of minimum deterrence.

The increasing chaos and distraction in the international arena have also given confidence to India. The Russia-Ukraine war, turmoil and turbulence in the Middle East, and the ensuing East-West conflict, the US withdrawal from Afghanistan, and the preoccupation of global powers with multiple simultaneous crises mean India faces a diluted international scrutiny. The world trends hence confirm the Indian philosophy of the primacy of hard power as the means of security. Where global powers themselves defy rules or are too distracted by bigger crises, India finds a freer hand to pursue its ambitions in the region by gaining a false sense of superiority.

False Sense of Conventional Superiority: The Pahalgam Incident

In April–May 2025, India leveraged the Pahalgam incident as a pretext to initiate escalation against Pakistan, aiming to create space for a limited war under the nuclear overhang.[40] Indian leaders immediately blamed Pakistan for the April 22 attack in Pahalgam[41] without presenting evidence or awaiting investigation, and they launched military operations breaching Pakistani sovereignty in unprovoked aggression. Within two weeks, India

[38] Stockholm International Peace Research Institute (SIPRI), *SIPRI Yearbook 2025: Armaments, Disarmament and International Security. Summary* (Stockholm: SIPRI, 2025), https://www.sipri.org/sites/default/files/2025-06/yb25_summary_en.pdf
[39] Ibid; Hans Kristensen, Matt Korda, Eliana Johns, Mackenzie Knight-Boyle, and Kate Kohn, "Status of World Nuclear Forces," Federation of American Scientists, March 26, 2025, https://fas.org/initiative/status-world-nuclear-forces/
[40] "Pahalgam Tensions: Army Leadership Warns of Decisive Response against Any Indian Attempt to Impose War," *Dawn*, May 2, 2025, https://www.dawn.com/news/1907995
[41] "India Shifted Entire Blame of Pahalgam Attack on Pakistan Without Evidence: PM," *Dawn*, May 7, 2025, https://www.dawn.com/news/1909135

carried out cross-border strikes (codenamed Operation Sindoor) deep into Pakistan,[42] ostensibly targeting alleged "terrorist infrastructure" but in reality, hitting Pakistani territory and even civilian areas. By circumventing independent inquiry and opting for force, India deliberately provoked a nuclear neighbor, displaying what Pakistan called irresponsible and abnormal strategic behavior.

Indian authorities simultaneously opened other fronts to pressurize Pakistan. New Delhi exploited proxies to foment violence inside Pakistan during the crisis. Indeed, a substantial part of the Pakistani military remained tied down fighting India-backed insurgencies in Balochistan and Khyber Pakhtunkhwa (KPK), a result of India's covert support for terrorism on Pakistani soil. Such actions meant India was provoking Pakistan in both the conventional arena and the sub-conventional (insurgency) domain, an extraordinarily reckless approach between two nuclear powers.

Rather than seeking to defuse the situation, Indian leadership whipped up war hysteria and pursued escalation. Escalatory media and hawkish officials in New Delhi talked of teaching Pakistan a lesson.[43] India's military was given carte blanche to strike across the Line of Control (LoC). This strategy aimed for escalation domination, whereby India would intimidate Pakistan by sheer force and dictate the tempo of conflict. India's newly formulated Dynamic Response Strategy (DRS) underpinned this approach. DRS is an evolution of India's limited-war doctrine, a shift from Cold Start's proactive offensives to multi-domain strikes below the nuclear threshold, focused on seizing the initiative and controlling escalation. In theory, such a doctrine seeks to retain the upper hand at every rung of the conflict ladder. In practice, during the Pahalgam crisis, this overconfidence proved misplaced, as Indian planners grossly underestimated Pakistan's resolve and capability.

[42] Zahir Kazmi, "Seeing the Whole Board: Rethinking Strategic Signalling in the South Asian 2025 Crisis," *Strategic Vision Institute,* May 23, 2025, https://thesvi.org/seeing-the-whole-board-rethinking-strategic-signalling-in-the-south-asian-2025-crisis/

[43] "Time to Teach Pakistan a Lesson: Congress Adopts Pahalgam Attack Resolution," *The Tribune (India)*, May 2, 2025, https://www.tribuneindia.com/news/india/time-to-teach-pakistan-a-lesson-congress-adopts-pahalgam-attack-resolution/

Bolstered by a false sense of impunity, India also engaged in unprecedented political coercion. Modi's government unilaterally suspended the IWT, threatening Pakistan's water lifeline in an act Pakistan likened to a declaration of war.[44] This attempt at hydro-political coercion flagrantly violated a decades-old international treaty and showed New Delhi's willingness to flout norms for strategic gain. Indian officials further inflamed tensions with belligerent rhetoric. During the crisis, India's leadership openly dismissed Pakistan's nuclear deterrent as a mere "nuclear bluff" and even boasted about the ability to break Pakistan apart. Defence Minister Rajnath Singh went so far as to claim[45] that fully deploying India's navy "could have fragmented Pakistan further," while Modi exulted that India's strikes have burst Pakistan's bubble of nuclear blackmail.[46] Such cavalier statements, implying India could neutralize Pakistan's atomic arsenal and dismember its state, were shockingly irresponsible coming from the helm of a nuclear nation. They signaled an abnormal strategic mindset rooted in hubris and a dangerous disregard for nuclear realities.

On the other side, Pakistan responded to the crisis with strong resolve, adhering to its doctrine of restraint plus requisite force. Islamabad strenuously denied involvement in the Pahalgam attack and immediately offered to cooperate with a neutral international investigation,[47] a stance reinforcing that Pakistan sought de-escalation and truth-finding. However, when India violated Pakistan's sovereignty with missile and air strikes on May 6–7, Pakistan exercised its right to self-defense under the UN Charter, launching a calibrated military riposte. Codenamed Operation Bunyan-um-Marsoos,[48] Pakistan's response was precisely targeted at Indian military assets and kept carefully limited in scope. The Pakistani armed forces struck

[44] "Pahalgam attack: India suspends Indus Waters Treaty with immediate effect, closes Attari border crossing," Dawn News, April 23, 2025, https://www.dawn.com/news/1906075.
[45] Rajat Sharma, "Why Rajnath Singh Said Navy Could Have Broken Pakistan into Four," *RajatSharma.in*, May 31, 2025, https://rajatsharma.in/why-rajnath-singh-said-navy-could-have-broken-pakistan-into-four/
[46] Narendra Modi, "PM Modi Lok Sabha Speech" (speech, Lok Sabha, India), YouTube video, July 29, 2025, https://www.youtube.com/watch?v=sza52VZPmPk
[47] "PM Shehbaz Says Pakistan Open to 'Neutral, Transparent' Probe into Pahalgam Attack," *Dawn*, April 26, 2025, https://www.dawn.com/news/1906694
[48] Abid Hussain, "Pakistan launches Operation Bunyan Marsoos: What we know so far," 10 May 2025, Al Jazeera, https://www.aljazeera.com/news/2025/5/10/pakistan-launches-operation-bunyan-marsoos-what-we-know-so-far

Indian military installations across multiple frontiers (from Kashmir to Punjab and Rajasthan) but scrupulously avoided civilian targets. This reflects Pakistan's professed operational policy of "Quid Pro Quo Plus (QPQ+),"[49] an operational strategy based on answering any Indian attack with a proportionate-plus conventional response, enough to punish the aggressor and deny victory, but calibrated to prevent uncontrollable escalation. By demonstrating a potent conventional reply (as it did in the 2019 'Swift Retort' and now in 2025 under Bunyan-um-Marsoos), Pakistan aims to deny India any space for military adventurism below the nuclear threshold.

The Pakistan Air Force (PAF) and air defenses swiftly downed six Indian fighter jets and drones during India's attacks,[50] underscoring a robust "kill chain" that caught India by surprise. By May 9–10, Pakistani forces had blunted India's attempted escalation dominance, retaliating in kind and holding their own in conventional exchanges. This reality exposed weaknesses in India's much-touted conventional superiority. Facing mounting losses and the inability to secure a quick win, New Delhi was ultimately forced to seek an exit from the conflict.

The outcome of the four-day conflict yielded important strategic lessons favoring Pakistan's position. India's myth and a false sense of conventional supremacy were shattered, as Pakistan's smaller but all-inclusive and fully equipped military proved more than capable of retaliating forcefully. Indian ambitions to unilaterally impose its will, militarily or through treaties like the IWT, were checked by Pakistan's preparedness and national unity. The crisis fully unmasked India's irrational decision-making and false sense of conventional superiority, revealing New Delhi's deception to the world.

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[49] Lt. General Khalid Ahmed Kidwai, "Keynote Address at the Seminar on 'Strategic Stability in South Asia: Is India a Responsible Nuclear State?'" Institute of Strategic Studies Islamabad, https://issi.org.pk/remarks-by-lt-general-khalid-ahmed-kidwai-seminar-on-strategic-stability-in-south-asia-is-india-a-responsible-nuclear-state/

[50] Aamir Latif, "Pakistan shot down 6 Indian jets, including 4 French-made Rafale during conflict: Premier Sharif," 28 May 2025, Anadolu Ajansi, https://www.aa.com.tr/en/asia-pacific/pakistan-shot-down-6-indian-jets-including-4-french-made-rafale-during-conflict-premier-sharif/3582409

West Turning a Blind Eye to India

The permissive attitude of Western powers, particularly the US, towards India's strategic program as well as its destabilizing actions in the region has further emboldened New Delhi's confidence. The West, in pursuance of its geopolitical and geoeconomic interests, has clearly turned a blind eye to actions that could have provoked sanctions or broader condemnation if they were undertaken by any other state. This double standard and country-specific approach is evident in the Indo-US nuclear deal and the 2008 NSG waiver.[51] In addition, the US created an exception for India despite its refusal to join the NPT, which is a prerequisite for NSG membership. In 2005, despite decades-long US policy linking nuclear cooperation to NPT adherence, Washington publicly recognized India as a country possessing advanced nuclear technology that deserves the same benefits and advantages as any other state. In addition to the NSG waiver, the West has consistently ignored India's provocative actions that are destabilizing for the regional peace and stability. It is largely due to their preference to leverage India's geopolitical and geostrategic significance to contain China's peaceful rise and growing influence. This preference is manifested in many ways, for example, the international community's muted response to India's anti-satellite (ASAT) weapon test in March 2019. Instead of condemning the test, the US stated[52] that it has taken note of this development and emphasized continued cooperation in the space arena.

The West's exceptionalism is further evident in export control regimes and high-technology trade. Despite not being a signatory to the NPT, India has been included in the elite clubs such as the Wassenaar Arrangement and Missile Technology Control Regime (MTCR). This inclusion enabled New Delhi to acquire advanced weapons as well as dual-use technologies. Moreover, the West did not take into account India's violations of norms of restraint and their consequences on regional stability. Hence, several

[51] Nazia Sheikh, "India's Nuclear Waiver: A Strategic Blunder with Global Consequences," CISS AJK, July 28, 2025, https://cissajk.org.pk/2025/07/28/indias-nuclear-waiver-a-strategic-blunder-with-global-consequences

[52] "US Takes Note of India's Statements on Space Debris Created by ASAT Test," *NDTV*, April 2, 2019, https://www.ndtv.com/india-news/us-takes-note-of-indias-statements-on-space-debris-created-by-asat-test-2016966

Western powers signed intelligence-sharing agreements[53]as well as massive defense deals with India. Through these deals, they transferred sophisticated naval hardware, advanced fighter jets. These transfers directly impacted the security and stability paradigm of the region.

Way Forward

Pakistan should continue to reinforce its full-spectrum deterrence policy. Pakistan's operational policy of QPQ+ should be reinforced by robust conventional capabilities with cohesive national response, as future conflicts may be more intense and compressed in time. The message to India should be very clear that Pakistan stands ready to meet any aggression at every escalation level with a strong response and resolve.

Indian leadership needs to recognize that escalation dynamics are unpredictable and that the notion of escalation domination is a perilous proposition in a military conflict between two nuclear-weapon states. Advances in weapon systems and technologies are blurring the rungs of escalation, making escalation dynamics unpredictable. Therefore, Indian policymakers need to abandon their violence-driven strategy and consider a way forward toward the political resolution of the conflict.

The Indian narrative of terrorism by alleging Pakistan for any anti-India violence should be systematically revealed to international scrutiny, and Pakistan should now convince the international community to investigate Indian state-sponsored terrorism in Pakistan and around the world. Indian policy of deception should be revealed through political, diplomatic, and rational academic efforts before India ventures into another abnormal strategic madness that endangers this region and beyond.

Pakistan, as a responsible nuclear state, should continue to project strategic restraints, keep space open for Confidence Building Measures (CBMs),

[53] Ariel Stenek, "Toward a Quadrilateral Intelligence Sharing Network? Is the Time Ripe for the U.S. to Formalize an Intelligence-Sharing Network with Quad Partners Australia, Japan, and India?" *The Diplomat*, January 7, 2022, https://thediplomat.com/2022/01/toward-a-quadrilateral-intelligence-sharing-network/#:~:text=A%20Patchwork%20of%20Quadrilateral%20Intelligence%20Capabilities&text=Beyond%20this%2C%20Japan%20signed%20the,enabling%20interoperability%20among%20Quad%20states.

which are halted, and reopen the proposal of a Strategic Restraint Regime (SRR) to India. Without imposing a restraint, India will continue to build up military capabilities, coupled with Hindutva-driven abnormality, which will not only challenge South Asia but also the US' long-term footprint in Asia.

Lasting peace could only be achieved through dialogue, political maturity, and the concept of equality and shared prosperity. For this, India has to shed its Hindutva-driven mindset enveloped with a false sense of superiority and hegemony, which will even become a great obstruction to its self-growth and rise.

India should uphold the principles of multilateralism, respect the rules-based international order and international law, while committing to the political resolution of all outstanding disputes, including the Kashmir Issue, in accordance with UNSC resolutions. To achieve this, India needs to move away from a strategic discourse influenced by Hindutva ideologies. Unilateral alterations to binding agreements could jeopardize India's standing in the region, potentially compromising the welfare of over two billion people in South Asia in favor of hegemonic and extremist aspirations.

Conclusion

The regional security landscape in South Asia is in transition, implicating the regional peace and strategic stability. India, driven by its Hindutva ideology, continues to threaten regional peace and stability due to its coercive actions, irrational nuclear state behavior and destabilizing conduct. Despite India's abnormal state behavior, the West has turned a blind eye towards its actions. In fact, the West, particularly the US, emboldened India's strategic confidence and a false sense of hegemony by giving it the role of the Net Security Provider in the region.[54] Moreover, the strategic confidence is further amplified by the global destabilizing trends. The erosion of global norms and non-proliferation culture is also a contributing factor in India's strategic confidence. This confidence has led India to

[54] Sufian Ullah and Zeeshan Hayat, "India as a Net Security Provider in Indo-Pacific and Implications for the Region," *NUST Journal of International Peace & Stability* 4, no. 1 (2021): 30, https://doi.org/10.37540/njips.v4i1.77

believe that it can escape accountability and consequences of its destabilizing actions, which was evident in the May 2025 Pahalgam conflict. The post-Pahalgam strategic environment validates a bitter fact. The stability of South Asia is operating on a thin margin of error, and this margin is getting narrower. The conflict proved that in a nuclearized space, with condensed geography and unresolved conflicts, there is no linear process of escalation that can be adjusted at any time. It is a construct that is unstable due to misperception, domestic political imperatives, and the rate at which traditional behavior can have strategic repercussions. In such an environment, India's aim to create a space for limited war is merely strategic adventurism, rather than an innovation. Pakistan's swift, proportionate, and calibrated response through its QPQ+ operational strategy denied India the space it aimed to create under the thresholds of nuclear use. Nevertheless, the conflict revealed a recurring pattern in India's crisis behavior: accusation first, investigation later, using it as a pretext for coercive action. The conflict also revealed that there is no space for war between two nuclear-armed adversaries; otherwise, the world would come close to seeing a nuclear catastrophe. The way forward lies in dialogue, political maturity, the concept of equality and shared prosperity, and respect for multilateralism and the international rules-based order.

Türkiye, NATO and Extended Deterrence

Ali Alkis*

Abstract

This article analyzes Türkiye's evolving role in the North Atlantic Treaty Organization (NATO)'s nuclear deterrence posture, focusing on its participation in nuclear-sharing arrangements and exercises, such as Steadfast Noon (military exercise). As a member of the Alliance since 1952, Türkiye has played a geostrategically critical role by hosting the United States (US)' tactical nuclear weapons at Incirlik Air Base and supporting NATO's collective defence strategy. The study traces the historical trajectory of Türkiye's nuclear involvement, from Cold War deployments to its current engagement with modernized B61 nuclear bombs and associated readiness activities. It examines the operational contours of Steadfast Noon and the Turkish Air Force's contributions, particularly through its F-16 fleet. The analysis also addresses key challenges, including Türkiye's exclusion from the F-35 program, complications in air force modernization, its geopolitical balancing between the US and Russia, and tensions between its commitments to non-proliferation and assertive strategic discourse. The findings show Türkiye's continued importance to NATO's southern nuclear posture while highlighting how Ankara's pursuit of strategic autonomy introduces uncertainties that the Alliance must carefully navigate to maintain deterrence credibility and cohesion.

Keywords: Türkiye, NATO, Nuclear Deterrence, Extended Deterrence, Incirlik Air Base.

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Introduction

The contemporary international security landscape underscores the continued importance of nuclear deterrence for NATO, characterized by renewed great-power competition and persistent regional instability. The Alliance's official stance, repeated and enshrined in key documents, such as the Washington Summit declaration, is clear, stating that "As long as nuclear weapons exist, NATO will remain a nuclear alliance."[1] This key principle has shaped NATO's nuclear posture and has provided the essential context for understanding the roles and responsibilities of its member states within this framework. The emphasis on nuclear deterrence is not merely a repetition of Cold War doctrines but a direct and considered response to a perceived decay of the global security environment. This includes increased Russian aggression, accompanied by nuclear rhetoric and actions that challenge strategic stability.[2] Russia's 2022 invasion of Ukraine initially seemed to trigger a collective realization among NATO members that a new era of strategic competition had begun, leading to a new strategic concept explicitly designating Russia as the main threat.[3] Exercises like Steadfast Noon,[4] NATO's premier nuclear readiness drill, are thus framed as crucial demonstrations of resolve and capability in this evolving context, designed to ensure the credibility of the Alliance's deterrent against contemporary threats.[5]

In this context, as a member of NATO since 1952, Türkiye has a unique and pivotal position within this complex nuclear equation.[6] Its geostrategic location, serving as a land bridge between Europe and Asia and controlling critical maritime passages, has historically made it indispensable to

[1] "Nuclear Deterrence Exercise *Steadfast Noon* Concludes." *Supreme Headquarters Allied Powers Europe (SHAPE)*, October 24, 2024, https://shape.nato.int/news-archive/2024/nuclear-deterrence-exercise-steadfast-noon-concludes

[2] "NATO Flexes with Simultaneous Nuclear Strike and Naval Warfare Exercises," *The War Zone*, last modified October 25, 2024, https://www.thedrive.com/the-war-zone/nato-flexes-with-simultaneous-nuclear-strike-and-naval-warfare-exercises

[3] Dominika Kunertova and Olivier Schmitt, "Assessing NATO's cohesion: methods and implications," *International Politics* (November 2024): 1, https://doi.org/10.1057/s41311-024-00641-1.

[4] Steadfast Noon refers to NATO's military drill involving training flights with dual-capable aircraft (that can carry nuclear weapons) from multiple member nations to ensure readiness and signal capability against potential threats.

[5] Newdick, Thomas. "NATO Flexes with Simultaneous Nuclear Strike and Naval Warfare Exercises." *The War Zone* (The Drive), October 25, 2024, https://www.thedrive.com/the-war-zone/nato-flexes-with-simultaneous-nuclear-strike-and-naval-warfare-exercises.

[6] "Türkiye and NATO," NATO Declassified, 2024, https://www.nato.int/cps/en/natohq/declassified_191048.htm.

Alliance's security.[7] From the early years of its membership, Türkiye has been an active member in NATO's nuclear sharing arrangements, most notably as one of the five current host nations for the US' tactical nuclear weapons.[8] These weapons at Incirlik Air Base represent a tangible commitment to NATO's collective defence and extended deterrence posture.

However, Türkiye's role is complex. In recent years, Ankara has followed a foreign policy characterized by a desire for "strategic autonomy." It has led to actions and alignments that sometimes differ from those of other NATO allies.[9] Its relationship with Russia, a primary focus of NATO's deterrence efforts, further complicates its position within the Alliance's broader strategy.[10] This has been evident in how leaders in Türkiye have maintained "ambiguous" relations with Russia and, at times, opposed seemingly consensual policies (e.g., the initial blocking of Sweden's NATO accession or the delay in approving regional defence plans).[11] This pivotal nature of Türkiye is, therefore, a double-edged sword for NATO. Its geography and substantial military capacity are undeniable assets to the Alliance's deterrent capabilities.[12] Simultaneously, its "transactional approach" to NATO commitments and its independent foreign policy have introduced some issues into the Alliance's nuclear calculus.[13] This dynamic implies that the stability and credibility of NATO's southern flank nuclear posture are subject to Türkiye's domestic and foreign policy to a greater extent than with some other allies, which requires a continuous and nuanced diplomatic engagement by NATO. Despite these divergences, it is crucial to recognize that Ankara and the Alliance share fundamental threat perceptions, including concerns over Russia's aggressive revisionism,

[7] Ibid.
[8] Alberque, William. "The NPT and the Origins of NATO's Nuclear Sharing Arrangements." *Proliferation Papers*, no. 57. Paris: Institut français des relations internationales (Ifri), February 2017, https://www.ifri.org/sites/default/files/migrated_files/documents/atoms/files/alberque_npt_origins_nato_nuclear_2017.pdf
[9] NATO, "Türkiye and NATO."
[10] Sophia Epley, "Turkey's Balancing Act in the Ukraine Conflict—Again," *Foundation for Defense of Democracies (FDD),* March 5, 2025, https://www.fdd.org/analysis/op_eds/2025/03/05/turkeys-balancing-act-in-the-ukraine-conflict-again/.
[11] Dominika Kunertova and Olivier Schmitt, "Assessing NATO's Cohesion: Methods and Implications," *International Politics* 62 (2024): 1097–1110, https://doi.org/10.1057/s41311-024-00641-1.
[12] NATO, "Türkiye and NATO."
[13] Max Hoffman, *Flashpoints in U.S.-Turkey Relations in 2021* (Washington, D.C.: Center for American Progress, January 19, 2021): https://www.americanprogress.org/article/flashpoints-u-s-turkey-relations-2021/

terrorism, and the risks posed by regional instability on NATO's borders.

In this context, the article argues that Türkiye remains an important member of NATO and that its extended deterrence policies, despite some challenges, remain important. While its continuing role is evident in its active participation in nuclear readiness exercises such as Steadfast Noon, there are some challenges to address. The Turkish role in NATO's extended deterrence policies should take into account Türkiye's evolving strategic posture, challenges in modernizing its air power, and complex geopolitical relationships, as these factors both contribute to and pose challenges to the Alliance's nuclear cohesion and credibility. The following sections explore this argument by detailing NATO's nuclear deterrence architecture, including the principles of extended deterrence and nuclear sharing. In addition, it examines the historical and ongoing strategic importance of Türkiye within this framework, with a specific focus on the role of Incirlik Air Base. Furthermore, the article analyzes Türkiye's participation in Steadfast Noon exercises and examines the capabilities of the Turkish Air Force. Finally, it navigates the multifaceted challenges and dynamics influencing Türkiye's nuclear role, as its air power modernization, geopolitical balancing act, and national stance on nuclear weapons guide us into the future. Ultimately, the article concludes with offering final remarks on the future outlook.

The Architecture of NATO's Nuclear Deterrence

NATO's nuclear deterrence posture is fundamentally anchored in the collective defence commitment of Article 5, serving as the supreme guarantee of Alliance security. NATO's approach to nuclear deterrence is multifaceted and intricately woven from historical precedent, strategic imperatives, and intricate burden-sharing arrangements. The fundamental principle of deterrence, along with extended deterrence, is primarily supported by the US and manifested through nuclear-sharing agreements with select non-nuclear member states. These arrangements are designed to ensure Alliance cohesion, deter aggression, and maintain strategic stability in an unpredictable security environment.

As part of Türkiye's involvement in deterrence discussions, extended deterrence plays a relatively greater role. In the NATO context, extended deterrence refers to the explicit guarantee by the US to extend its nuclear "umbrella" to protect its allies.[14] This means that an attack, especially a

[14] Robert Peters, 'Extended Deterrence: A Tool That Has Served American Interests Since 1945,'

nuclear one, on a NATO ally could be retaliated against with a US response, with the potential use of nuclear weapons. The underlying logic of this posture is twofold: militarily, it signals to adversaries that the costs of aggression would outweigh any benefits; politically, it reduces the incentives for allies to develop their own independent nuclear arsenals, thereby supporting broader non-proliferation goals.[15] From the US perspective, it serves crucial national interests by maintaining global stability and reducing the likelihood of conflicts that could necessitate a large-scale conventional intervention. Furthermore, extended deterrence is not a unilateral provision of security; it is often conceptualized as a "two-way street," where allies, in return for the US security guarantee, contribute to overall Alliance security by augmenting American military power through basing, logistical support, and conventional force contributions.[16]

The credibility of the extended deterrence is its most important aspect. For deterrence, extended deterrence in this case, to be effective, a potential adversary must believe in both the capability and the willingness of the US to follow its commitments. However, this credibility has been questioned from time to time. As some analysts suggest, it is currently experiencing "creeping uncertainty" due to factors such as internal US political polarization, a strategic shift toward the Indo-Pacific, and the rapid expansion of nuclear arsenals by adversaries like Russia and China.[17] This tension is at the centre of what has been termed the "alliance security dilemma," which describes the balance between the risk of an ally being abandoned in a crisis and the risk of being drawn into a conflict that does not concern them.[18] Therefore, maintaining this credibility requires continuous political signalling, military exercises, and modernization of capabilities.

In more detail, NATO's nuclear sharing arrangements are a unique feature of the Alliance. It has allowed non-nuclear-weapon state (NNWS) allies to participate in the planning, training for, and, in the event of conflict, the

The Heritage Foundation, April 2, 2025, https://www.heritage.org/defense/report/extended-deterrence-tool-has-served-american-interests-1945

[15] Zuzanna Gwadera, "US Allies Question Extended Deterrence Guarantees, but Have Few Options," *Military Balance Blog* (International Institute for Strategic Studies), March 20, 2025, https://www.iiss.org/online-analysis/military-balance/2025/03/us-allies-question-extended-deterrence-guarantees-but-have-few-options/.

[16] Peters, *Extended Deterrence: A Tool That Has Served American Interests Since 1945* (April 2, 2025), https://www.heritage.org/defense/report/extended-deterrence-tool-has-served-american-interests-1945.

[17] Gwadera, "US allies question extended deterrence guarantees, but have few options."

[18] Kunertova and Schmitt, "Assessing NATO's Cohesion: Methods and Implications."

potential delivery of US tactical nuclear weapons.[19] These arrangements involve close consultations and common decision-making on nuclear weapons policy, typically within NATO's Nuclear Planning Group (NPG), which includes all member states except France (which maintains its own independent nuclear deterrent outside the NPG structure).[20] Participating host nations also maintain dual-capable aircraft (DCA) – aircraft certified to deliver both conventional and nuclear munitions.[21]

Currently, five NATO members host US B61 tactical nuclear bombs on their territory: Belgium, Germany, Italy, the Netherlands, and Türkiye.[22] Historically, Canada (until 1984) and Greece (until 2001) also hosted US nuclear weapons under these arrangements. The US retains full custody and control over these weapons in peacetime. The Permissive Action Link (PAL) codes, which are necessary to arm the weapons, remain under exclusive American control, ensuring that the weapons cannot be used without explicit authorization from the US President. In a wartime scenario, if the NPG made a decision and it was authorized by the US President (and, for UK-based US weapons historically, the UK Prime Minister), the weapons would be mounted on the DCA of the participating host nations for delivery.[23]

The legal and treaty basis for these arrangements has been heavily debated. NATO and the US have historically argued that nuclear sharing does not violate the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The reason for this argument is that no transfer of ownership or control of the weapons occurs in peacetime.[24] According to some analysts, the NPT was negotiated in the 1960s with the Soviet Union to accommodate existing NATO arrangements while constraining further proliferation.[25] While the Soviet Union tacitly accepted this interpretation at the time, modern Russia argues that nuclear sharing is in breach of Articles I and II of the NPT, which prohibit the transfer of nuclear weapons to NNWSs and the receipt or manufacture of such weapons by them, respectively.[26] These different

[19] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 44.
[20] Gwadera, "US allies question extended deterrence guarantees, but have few options."
[21] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 41.
[22] Ibid.
[23] Ibid, 15-25.
[24] North Atlantic Treaty Organization. *NATO's Nuclear Sharing Arrangements*. Brussels: NATO Public Diplomacy Division (PDD), Press & Media Section, February 2022, https://www.nato.int/nato_static_fl2014/assets/pdf/2022/2/pdf/220204-factsheet-nuclear-sharing-arrange.pdf.
[25] William Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 7.
[26] "Foreign Ministry Spokesperson Maria Zakharova's Answer to a Russian Media Question

interpretations will continue to be discussed in international arms control discourse for a long time. However, for NATO, these arrangements were decided in NATO's strategic documents, such as DC 6/1 in 1949, which addressed strategic bombing with all types of weapons, and the 1957 NATO Summit agreement to store nuclear warheads in Europe.[27]

Beyond these legal discussions, the principle of "Burden sharing" is integral to NATO's nuclear sharing arrangements.[28] It points to a collective approach in which the benefits, responsibilities, and risks associated with nuclear deterrence are shared across the Alliance. It is considered an institutionalized way of assessing costs and benefits for collective defence.[29] However, this principle has faced some challenges before the Russian invasion of Ukraine. Some host nations publicly debate the continued necessity and desirability of hosting US nuclear weapons. For instance, political factions in Germany, Belgium, and the Netherlands have periodically introduced parliamentary motions or coalition debates questioning the presence of these weapons, citing disarmament obligations and public opposition. These discussions created concerns that if some were to opt out, the political and strategic burden on the remaining hosts, such as Türkiye and Italy, would intensify.[30] Such a development could damage the Alliance's solidarity and potentially lead the remaining nations to re-evaluate their commitments or to seek other incentives or support from NATO to continue their participation.

This would also be seen as a vulnerability, as a decrease in the number of host nations could be perceived as a weakening of collective resolve. This would be interpreted as the concentration of risks and potentially make the remaining host nations more prominent targets or points of political pressure for adversaries. Furthermore, in the specific case of Türkiye, the removal of nuclear assets would likely be perceived not as a safety measure but as a vote of no-confidence by the Alliance. Such a move would risk triggering a 'cascading decoupling,' where the erosion of trust in Ankara prompts other host nations to question the immutability of their own security guarantees, thereby unravelling the political cohesion that nuclear

Regarding U.S. Ambassador to Poland Georgette Mosbacher's Statement on the Possibility of Relocating U.S. Nuclear Weapons Based in Germany to Poland." *Ministry of Foreign Affairs of the Russian Federation*, updated May 19, 2020, https://mid.ru/en/foreign_policy/news/733-19052020.

[27] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 14-15.

[28] NATO, *NATO's Nuclear Sharing Arrangements*.

[29] Kunertova and Schmitt, "Assessing NATO's cohesion: methods and implications," 4-6.

[30] Mustafa Kibaroğlu, "Reassessing the Role of U.S. Nuclear Weapons in Turkey," *Arms Control Today* (June 2010), https://www.armscontrol.org/act/2010-06/reassessing-role-us-nuclear-weapons-turkey

sharing is designed to cement.

The cornerstone of NATO's shared nuclear deterrent is the US B61 tactical nuclear gravity bomb. An estimated 100 of these weapons are currently deployed across six air bases in the five European host nations previously mentioned.[31] Türkiye is estimated to host between 20 and 30 of these B61 bombs at Incirlik Air Base, although precise numbers are classified and estimates vary across different public sources.[32] These weapons are stored in highly secure underground vaults, known as WS3 (Weapon Storage and Security System), typically located within hardened aircraft shelters.[33]

The B61 has received significant modernization over time. Known as the B61 Life Extension Program (LEP), it has focused on consolidating several older variants (B61-3, -4, -7, and -10) into the new B61-12 model.[34] Crucially, this modernization is linked to the transition of delivery platforms. The F-35A Lightning II is certified to carry the B61-12, representing a significant capability upgrade due to its stealth characteristics, which enhance survivability in contested airspace compared to older aircraft.[35] This program, with an approximate cost of $9 billion, was concluded with its last production unit in December 2024.[36] However, the B61-12 does not offer a completely "new" nuclear weapon in terms of increasing the stockpile size. There are two important components here. First, it reuses the physics packages from older bombs. Second, it incorporates a new guided tail kit for improved accuracy and a "dial-a-yield" feature that allows variable explosive power. [37] This enhanced precision allows for reduced yields to achieve similar effects against targets, potentially lowering collateral damage.

In a more recent development, the US has also begun production of the B61-13, a variant based on the B61-12 but with a much higher maximum yield, similar to the older B61-7 it is intended to replace. [38] One important point is

[31] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 14-15.
[32] Hans M. Kristensen, et al., "United States Nuclear Weapons, 2025," *Bulletin of the Atomic Scientists* 81, no. 1 (January 13, 2025), https://www.tandfonline.com/doi/full/10.1080/00963402.2024.2441624.
[33] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 14-15.
[34] "Nuclear Disarmament Turkey Fact Sheet." *Nuclear Threat Initiative*, updated October 8, 2024, https://www.nti.org/education-center/fact-sheets/nuclear-disarmament-turkey/
[35] Newdick, "NATO Flexes with Simultaneous Nuclear Strike and Naval Warfare Exercises."
[36] Aaron Mehta, "US Completes $9B B61-12 Nuclear Warhead Upgrade," *Breaking Defense*, updated January 7, 2025, https://breakingdefense.com/2025/01/us-completes-9b-b61-12-nuclear-warhead-upgrade/
[37] Mehta, "US completes $9B B61-12 nuclear warhead upgrade."
[38] "US completes $9B B61-12 nuclear warhead upgrade."

that the B61-13 is designated for US military use only and will be delivered by strategic bombers such as the B-2 Spirit and the forthcoming B-21 Raider. Therefore, it is not planned to be part of NATO's nuclear sharing arrangements.[39]This distinction highlights a dual-track approach in US nuclear modernization relevant to Europe. In this context, it is safe to state that the B61-12 aims to enhance the credibility of the shared deterrent available to NATO allies, while the B61-13 improves US-only strategic capabilities. However, this bifurcated approach has generated debate. While some view the B61-13 as a necessary reinforcement of the US strategic umbrella, others argue it risks creating a "two-tier" alliance structure. In this view, the most potent capabilities remain under exclusive US control, potentially weakening the political symbolism of the shared B61-12 mission and raising questions about the "coupling" of US strategic forces to European defence in a crisis. The primary delivery aircraft for NATO's B61 bombs have traditionally been the F-16 Fighting Falcon and the Panavia Tornado.[40]

Türkiye's Enduring Strategic Significance in NATO's Nuclear Framework

It is almost impossible to think of Türkiye's role within NATO's nuclear framework without reference to its history with the Alliance and its unique geostrategic position. However, to understand its enduring importance, one must first examine the evolving threat perceptions that drive Ankara's security calculus.[41]

Türkiye joined NATO on February 18, 1952, and the primary driver of Türkiye's membership was the pursuit of robust security guarantees against the Soviet Union's expansionist ambitions. It is important to note here that the Soviet Union had made territorial claims and sought greater control over the Turkish Straits following the end of World War II. Therefore, for Ankara, NATO membership was both a military necessity and a political decision to align with the West in the bipolar Cold War environment. NATO, in turn, recognized Türkiye's strategic value, acknowledging its capacity to provide land and sea bases, its substantial military forces, and

[39] "Far More Powerful B61-13 Guided Nuclear Bomb Variant Joins U.S. Stockpile," *The War Zone*, updated May 19, 2025, https://www.thewaronline.com/2025/05/far-more-powerful-b61-13-guided-nuclear-bomb-variant-joins-u-s-stockpile/

[40] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 16.

[41] Muhammed Ali Alkış, *Türkiye in the New World Order: The Nuclear Debate* (Geneva: Geneva Centre for Security Policy, May 2023), 7, https://dam.gcsp.ch/files/doc/alumninotes-muhammedalialkis-may2023

its critical geographic position on the southeastern flank of the Alliance, bordering the Soviet Union.[42]

For these reasons, Türkiye immediately became involved in NATO's evolving nuclear posture. The US began deploying nuclear weapons to Turkish territory as part of the broader NATO Atomic Stockpile agreement. The agreement aimed to reinforce deterrence against the Soviet bloc and included training allied forces to use these weapons.[43] Early US nuclear deployments included PGM-19 Jupiter Intermediate-Range Ballistic Missiles (IRBMs), which were stationed in Türkiye from 1961.[44] These missiles, however, became a focal point during the 1962 Cuban Missile Crisis and were withdrawn in 1963 as part of the secret US-Soviet agreement that resolved the crisis. This withdrawal, known as the Turkiye-for-Cuba missile trade, was opposed by Ankara, which feared it would weaken Alliance security and its own position against the Soviet threat.[45] This experience may have left a lasting impression on Turkish strategic thinking. It could be argued that it led to a sense that its core security interests could be subordinated to broader great-power rivalry. In contemporary terms, this historical precedent could inform Ankara's pursuit of strategic autonomy. It might further be argued that these policies aim to reduce over-reliance on external actors for fundamental security needs.

Beyond the Jupiter missiles, other US nuclear systems were deployed in Türkiye, including tactical gravity bombs from February 1959, MGR-1 Honest John surface-to-surface missiles from May 1959, and nuclear-capable 8-inch M110 howitzers from June 1965.[46] These deployments reinforced Türkiye's frontline status and its integral role in NATO's forward defence strategy during the Cold War.

In all these arrangements, Incirlik Air Base, located near Adana in southern Türkiye, has been central to Türkiye's role in NATO's nuclear posture. Constructed by the US Army Corps of Engineers between 1951 and 1954, it became operational in 1955, initially named Adana Air Base and renamed Incirlik in 1958. A joint use agreement between the Turkish General Staff

[42] Alkış, "*Türkiye in the New World Order: The Nuclear Debate* (Geneva: Geneva Centre for Security Policy."
[43] William Burr, "Nuclear Weapons and Turkey Since 1959," *National Security Archive*, The George Washington University, October 30, 2019, https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2019-10-30/nuclear-weapons-and-turkey-1959
[44] Kibaroglu, "Reassessing the Role of U.S. Nuclear Weapons in Turkey."
[45] Aaron Stein, "Turkey and Tactical Nuclear Weapons: A Political Love Affair" (EDAM, 2012), https://edam.org.tr/wp-content/uploads/2012/11/Turkey_TacticalNuclearWeaponsCleandraft.pdf
[46] Burr, *Nuclear Weapons and Turkey Since 1959*.

and the US Air Force was signed in December 1954, formalizing its role as a key NATO facility.[47]

Throughout the Cold War and beyond, Incirlik proved its strategic value not only in deterring the Soviet Union but also as a vital staging and logistical hub for responding to crises in the Middle East and for power projection.[48] It was used, for example, for U-2 reconnaissance flights over the Soviet Union until Francis Gary Powers' aircraft was shot down in 1960.[49] The multifaceted importance of Incirlik provides Türkiye with significant leverage, extending its role beyond its nuclear mission to encompass critical logistical and power-projection capabilities for NATO in a volatile region. At this point, one clarification might be useful. In this context, access to Incirlik for operations not under a NATO flag but often US-led has historically been subject to Turkish political approval, creating a complex interdependence. The 1975 Turkish suspension of non-NATO US activities at Incirlik in response to a US arms embargo following the Cyprus intervention is a case in point.[50] Thus, the security and operational status of US nuclear weapons at Incirlik cannot be entirely decoupled from the broader US-Türkiye bilateral relationship and Türkiye's regional foreign policy objectives.

Currently, Incirlik Air Base is believed to be one of the six European air bases hosting US B61 tactical nuclear bombs under NATO's nuclear sharing arrangements.[51] Estimates suggest that approximately 20 to 30 B61 bombs are stored at the base. These weapons are under the guardianship of US Air Force (USAF) personnel, and the PAL codes required for their arming remain under strict US control.[52] The facilities at Incirlik, including the underground WS3 weapon storage vaults, have received security upgrades and modernization over time. These were partly to ensure compatibility with newer systems and maintain security standards.[53] However, periods of political tension between Türkiye and the US, as well as regional instability, have led to recurring speculation about the potential withdrawal of these weapons from Incirlik. There have been discussions

[47] "Is It Time to Withdraw US Nuclear Weapons from Incirlik?," *Military.com*, November 14, 2019, https://www.military.com/daily-news/2019/11/14/time-withdraw-us-nuclear-weapons-incirlik.html.
[48] "Incirlik Air Base History," *U.S. Air Force*, updated November 2018, https://www.incirlik.af.mil/About-Us/Fact-Sheets/Display/Article/300814/incirlik-air-base-history/.
[49] Micallef, "Is It Time to Withdraw US Nuclear Weapons from Incirlik?"
[50] Ibid.
[51] Alberque, *The NPT and the Origins of NATO's Nuclear Sharing Arrangements*, 12-15.
[52] Hans M. Kristensen et al., "United States Nuclear Weapons, 2025."
[53] Newdick, "NATO Flexes With Simultaneous Nuclear Strike And Naval Warfare Exercises."

about alternative locations, such as RAF Lakenheath in the UK, as contingency air bases.[54] Yet, strategic planners generally recognize that such a removal would transcend mere logistical relocation; adversaries would likely interpret it as a 'geopolitical retreat.' Removing the nuclear stockpile from the Southern Flank would signal a diminishing US commitment to the region, potentially emboldening Russia or Iran to test NATO's resolve in a way that the current presence deters.

From the Turkish perspective, Ankara has viewed its NATO membership and nuclear sharing arrangements as important aspects of its national defence and security policy. Ankara has valued the deterrent effect of US nuclear weapons on its territory, especially against the Soviet Union during the Cold War. [55] A key principle underpinning Türkiye's participation in NATO's nuclear posture is that of "burden sharing." Türkiye has strongly subscribed to this concept since joining the Alliance, a commitment demonstrated even before membership by its significant troop contributions to the United Nations forces during the Korean War.[56] In this line, Ankara's position aligns with other NATO host nations to maintain their hosting of nuclear weapons, given that this has been seen as essential for Alliance solidarity.[57]This position is not only about the equitable distribution of physical risk but also about ensuring broad political buy-in and solidarity across the Alliance for the nuclear mission. From Ankara's perspective, a wider distribution of hosting responsibilities reinforces the collective nature of nuclear deterrence. Therefore, it makes it more difficult for any single host nation to be singled out or unduly pressured. Ultimately, any move towards moving US nuclear weapons out of Europe or to fewer European locations could be interpreted as a potential weakening of NATO's collective political resolve on nuclear deterrence.

Beyond hosting nuclear weapons, Türkiye also contributes to NATO with conventional capabilities. Ankara has the second-largest army in the Alliance and a rapidly developing indigenous defence industry. It also maintains diplomatic relations with the Middle East, the Caucasus, and Central Asia. Furthermore, Türkiye controls the Turkish Straits (the Bosporus and the Dardanelles) in accordance with the 1936 Montreux Convention. These straits are of strategic importance to NATO, especially

[54] Hans Kristensen, "NATO Tactical Nuclear Weapons Exercise and Base Upgrades," (October 14, 2024), https://fas.org/blogs/security/2024/10/steadfast-noon-2024/
[55] Alkış, *Türkiye in the New World Order: The Nuclear Debate*, 6-7.
[56] Kibaroglu, "Reassessing the Role of U.S. Nuclear Weapons in Turkey."
[57] Stein, "Turkey and Tactical Nuclear Weapons: A Political Love Affair."

for naval movements in the Black Sea.[58]

Despite its fundamental reliance on NATO for security, Türkiye's relationship with the Alliance has not been without its challenges. Historical experiences, such as initial European reservations about its membership and the impact of the 1974 US arms embargo following the Cyprus intervention, have raised some Turkish doubts about the unconditional nature of NATO's Article V- collective defence commitment.[59] These experiences, heightened by the belief that its security priorities were not always fully appreciated by all allies, have contributed to Ankara's more proactive and sometimes assertive stance in NATO decision-making processes, as it seeks to ensure its national interests are adequately addressed.[60]

In the contemporary security environment, Türkiye's primary threat perception has shifted from a singular Cold War focus to a complex, multi-dimensional landscape. The renewed aggression of Russia, particularly following the invasion of Ukraine and the militarization of the Black Sea, has reignited concerns regarding conventional imbalances and nuclear coercion in Türkiye's immediate neighbourhood. Simultaneously, the instability on its southern flank, specifically in Syria and Iraq, along with concerns over potential Weapons of Mass Destruction (WMD) proliferation by neighbours like Iran, reinforces Ankara's reliance on NATO's security umbrella. In this context, extended deterrence serves a dual purpose for Türkiye: it provides a guarantee against nuclear blackmail from major powers while serving as a hedge against regional instability.

Steadfast Noon: Türkiye's Participation in NATO's Premier Nuclear Exercise

Steadfast Noon is NATO's main annual exercise, designed to test and validate its nuclear deterrence posture. It plays an important role in ensuring the readiness of Allied forces and reinforcing the credibility of the Alliance's nuclear capabilities. Türkiye, as a host nation for tactical nuclear weapons and a country with a considerable air force, takes a role in these exercises.

The primary objective of Steadfast Noon is to ensure the credibility, effectiveness, safety, and security of NATO's nuclear deterrent mission.[61]

[58] NATO, "Türkiye and NATO."
[59] Stein, "Turkey and Tactical Nuclear Weapons: A Political Love Affair."
[60] Ibid.
[61] "Nuclear deterrence exercise Steadfast Noon concludes."

It is consistently described by NATO as a "routine and recurring training activity," typically held in October and planned well over a year in advance.[62] Officials emphasize that the exercise is not linked to specific ongoing world events but is a fundamental part of maintaining readiness. The exercise focuses entirely on nuclear deterrence, involving training flights with DCA but without carrying live warheads. It serves to practice NATO's nuclear strike mission, integrating DCA from host nations with the US B61 tactical nuclear bombs deployed in Europe. [63]

Steadfast Noon typically involves around 13 to 14 Allied nations, mobilizing more than 60 aircraft of various types, and approximately 2,000 military personnel. The aircraft participating include DCA (such as F-16s, F-35As, and Tornados), conventional fighter escorts, surveillance and reconnaissance aircraft (e.g., AWACS), air-to-air refuelling tankers, and often US Air Force B-52 strategic bombers flying from the US or forward-deployed locations. [64] The exercise scenarios are designed to be complex and realistic, "stressing the overall system" by placing personnel in high-tempo operational environments and challenging their ability to coordinate actions "literally down to the minute of when we would put a weapon onto a target" against a fictional adversary.[65]

The strategic significance of Steadfast Noon lies in many elements. First and foremost, it sends a clear message to any potential adversary of NATO's capabilities. It also exemplifies the collective resolve to protect and defend all Allies. In addition, it reinforces Alliance cohesion by demonstrating solidarity and practicing interoperability among member states in the most sensitive of military operations.[66] The increasing visibility and explicit messaging accompanying Steadfast Noon in recent years suggest a deliberate NATO strategy. It serves to enhance the signalling value of these exercises in a delicate global security atmosphere.[67] This places participating nations, including Türkiye, more directly in the geopolitical spotlight. Therefore, it reinforces their commitment while potentially exposing them to adversaries who closely monitor such exercises.

The Turkish Air Force (TAF) has consistently participated in Steadfast

[62] Newdick, "NATO Flexes with Simultaneous Nuclear Strike and Naval Warfare Exercises."
[63] Ibid.
[64] Ibid.
[65] "Nuclear deterrence exercise Steadfast Noon concludes."
[66] "From High Noon to Steadfast Noon," *In Depth News*, updated October 14, 2024, https://www.indepthnews.net/index.php/opinion/4922-from-high-noon-to-steadfast-noon.
[67] Newdick, "NATO Flexes with Simultaneous Nuclear Strike and Naval Warfare Exercises."

Noon exercises. Türkiye joins with its large fleet of F-16 Fighting Falcon aircraft. It is important to note here that Ankara is the second-largest operator of F-16s within NATO, with over 250 units in active service, making this aircraft the backbone of its air power. Historically, the TAF's role in nuclear sharing involved training its pilots and crews in procedures for loading, transporting, and employing US B61 tactical nuclear weapons with its designated DCA (which, over the years, included F-100s, F-104s, F-4s, and F-16s). [68]

However, some analyses, especially from the early 2010s, imply a potential evolution or clarification of the TAF's role in these exercises. It is argued that Turkish F-16s might be focusing more on training as non-nuclear air defence escorts for other NATO nuclear-capable fighter wings, instead of practicing direct nuclear delivery missions.[69] If this shift is accurate and has been sustained, it could represent a subtle but significant recalibration of Türkiye's operational involvement in the nuclear delivery aspect of sharing. Such a change might be attributable to various factors, including issues related to aircraft modernization and certification for the newest B61 variants, especially in light of Türkiye's exclusion from the F-35 program. The suggestion of an escort role would still allow Türkiye to maintain its political participation in nuclear sharing by hosting weapons, participating in the NPG, and joining exercises. However, it would decrease its direct operational stake in the nuclear delivery mission itself. This could change the dynamics of "burden sharing" and the specific military contributions Türkiye makes. This should be considered within the broader perspective of potentially impacting perceptions of its full commitment or creating a tiered level of participation within the nuclear sharing framework.

Regardless of the precise nature of its current role in simulated delivery, Türkiye's participation in Steadfast Noon is vital for maintaining the TAF's interoperability with other Allied air forces and for adapting its combat strategies to the latest technologies and operational methods employed by NATO partners. The exercises also provide insights from post-exercise evaluation, which can inform TAF modernization planning and the development of more effective military doctrines. The modernization of Türkiye's F-16 fleet is already ongoing, while the US has approved the sale of 40 new F-16 Block-70 Viper aircraft and 79 upgrade kits for its existing fleet. Lockheed Martin is involved in these upgrades, which include advanced AESA radar systems, enhanced avionics, and extended structural

[68] Kibaroglu, "Reassessing the Role of U.S. Nuclear Weapons in Turkey."
[69] Stein, "Turkey and Tactical Nuclear Weapons: A Political Love Affair."

life. At the same time, Türkiye is pursuing indigenous upgrade programs for its F-16s, such as the Özgür-II project.[70]

Crucially, however, the shift in platforms impacts the technical execution of the deterrence mission. While legacy F-16s can carry the B61-12, they may be limited to employing it in an 'analog' or ballistic mode, using it as a standard gravity bomb. Full utilization of the B61-12's digital capabilities—specifically its guided tail kit, which provides high-precision targeting—requires advanced digital avionics integration found in the F-35 and F-15E. While the new F-16 Block 70 Vipers feature advanced mission computers, the level of their certification for the B61-12's full digital interface remains a critical variable. If the Turkish fleet is technically restricted to analog delivery, the operational logic suggests a permanent shift in the TAF's role: moving from a primary nuclear strike force to a suppression of enemy air defence and high-value escort force, supporting other Allies' fifth-generation nuclear carriers.

Navigating Complexities: Challenges and Dynamics of Türkiye's Nuclear Role

Türkiye's participation in NATO's nuclear framework, while strategically significant, is increasingly shaped by complex challenges and evolving dynamics. These include the political and military ramifications of its exclusion from the F-35 fighter program and its intricate geopolitical balancing act between Western allies and Russia.[71]

A major complication for Türkiye's future role in NATO's nuclear mission is its 2019 expulsion from the Lockheed Martin F-35 Lightning II program. This decision by the US was a direct consequence of Ankara's acquisition of the Russian S-400 Triumf air defence system, which Washington and other NATO allies viewed as incompatible with NATO systems and a potential threat to the security and stealth capabilities of the F-35. The concern was that the S-400's advanced radar systems could collect sensitive data on the F-35, which might then be compromised or shared with Russia.[72]

This expulsion had significant implications for the Turkish Air Force (TAF). Türkiye had planned to acquire at least 100 F-35A jets, intended to

[70] "Turkish Air Force: Prospects and Challenges Ahead," *Trends Research & Advisory*, updated March 19, 2025, https://trendsresearch.org/insight/turkish-air-force-prospects-and-challenges-ahead/.
[71] Alkış, *Türkiye in the New World Order: The Nuclear Debate*, 8.
[72] Ibid, 8.

form the next generation of its fighter fleet and to serve as a key platform for delivering the modernized US B61-12 nuclear bombs, for which the F-35A is certified. Six F-35s that had been produced for Türkiye prior to its removal remain in storage in the US.[73] The denial of this 5th-generation aircraft has created a notable capability gap. While Türkiye is undertaking extensive modernization of its existing F-16 fleet, including the procurement of new F-16 Block 70 Vipers and domestic upgrade programs like Özgür-II, these are 4th-generation aircraft.[74] Although F-16s are also certified to carry the B61-12, indications suggest that not all F-16 variants may fully utilize the bomb's precision-guidance capabilities, and they lack the survivability of a stealth platform like the F-35 in contested airspace.

Ankara is also exploring the acquisition of Eurofighter Typhoons as a solution. At the same time, it is also developing its own indigenous 5th-generation fighter, the TF-X KAAN, which is projected to enter service from 2028 onwards. [75] However, achieving NATO nuclear certification for KAAN would be a lengthy and complex process with no guarantee of success if Ankara plans to do so. Furthermore, Turkish President Recep Tayyip Erdoğan criticized the F-35 exclusion, particularly in light of potential US offers of the aircraft to other non-NATO partners, such as India. While Ankara has expressed a desire to rejoin the F-35 program, the US maintains that the complete removal of the S-400 system from Turkish soil is a non-negotiable precondition. This impasse directly affects Türkiye's long-term capacity to contribute to NATO's high-end conventional and nuclear deterrence missions with the most advanced, interoperable platforms. The situation could lead to a de facto marginalization of the TAF's role in actual nuclear delivery missions, even if it continues to host weapons and participate politically, potentially impacting the perceived credibility of nuclear sharing in NATO's southern region.

In addition, Türkiye's strategic behaviour is best understood through the lens of Glenn Snyder's 'alliance security dilemma.'[76] Ankara is constantly recalibrating its position to mitigate two distinct and opposing fears: abandonment by its Western allies amid regional threats, and entrapment in

[73]"Turkish Air Force: Prospects and Challenges Ahead," *Trends Research & Advisory*, updated March 19, 2025, https://trendsresearch.org/insight/turkish-air-force-prospects-and-challenges-ahead/.
[74] Trends Türkiye Virtual Office, "Turkish Air Force: Prospects and Challenges Ahead."
[75] Ibid.
[76] Glenn H. Snyder, "The Security Dilemma in Alliance Politics," *World Politics* 36, no. 4 (1984): 461–95, https://doi.org/10.2307/2010183

a direct conflict with Russia that does not serve its immediate national interests. While a long-standing NATO ally, Türkiye has increasingly pursued what it terms a policy of "strategic autonomy" to manage this dilemma, driven by its own national security imperatives and regional ambitions.[77] This has led to deeper economic ties with Russia, including cooperation on the Akkuyu nuclear power plant built by Rosatom, and to Türkiye's positioning as a key mediator in conflicts involving Russia, such as Russia's war on Ukraine.[78]

This balancing act, while potentially offering Ankara diplomatic leverage and economic benefits, inherently creates unease and mistrust within the NATO Alliance. The unity formed by common interests is the centre of gravity for any alliance, and is therefore a primary target for an adversary.[79] Allies have expressed concerns about Türkiye's reliability and the potential for its closer ties with Moscow to be exploited by Russia to weaken NATO cohesion.[80] Tensions with the US have extended beyond the S-400/F-35 issue to include differing approaches to regional conflicts, particularly in Syria regarding the terrorist organization PYD/YPG, and broader concerns in Washington and some European capitals about the democratic situation in Türkiye.[81]

Russia, for its part, views NATO's eastward expansion and its nuclear sharing arrangements as direct threats to its security.[82] Moscow considers NATO's stationing of US nuclear weapons on the territory of non-nuclear member states. The training of these states' pilots for nuclear missions is a violation of both the NPT and commitments made in the NATO-Russia Founding Act of 1997, which stated NATO had "no intention, no plan and no reason to deploy nuclear weapons on the territory of new members".[83] The presence of US nuclear weapons on Turkish soil thus becomes an even more sensitive issue in the context of Ankara's multifaceted relationship

[77] NATO, "Türkiye and NATO."
[78] Muhammed Ali Alkış, "Why Russia May Control Turkey's Nuclear Energy for the Next 80 Years," *Bulletin of the Atomic Scientists*, February 21, 2023, https://thebulletin.org/2023/02/why-russia-may-control-turkeys-nuclear-energy-for-the-next-80-years/
[79] Kunertova and Schmitt, "Assessing NATO's cohesion: methods and implications."
[80] NATO, "Türkiye and NATO."
[81] Ibid.
[82] Shannon Bugos, "Putin Orders Russian Nuclear Weapons on Higher Alert," *Arms Control Today*, March 2022, https://www.armscontrol.org/act/2022-03/news/putin-orders-russian-nuclear-weapons-higher-alert.
[83] Ministry of Foreign Affairs of the Russian Federation, "Foreign Ministry Spokesperson Maria Zakharova's Answer to a Russian Media Question Regarding US Ambassador to Poland Georgette Mosbacher's Statement on the Possibility of Relocating US Nuclear Weapons Based in Germany to Poland," https://www.mid.ru/en/foreign_policy/news/1433196/.

with Moscow, given that no further sharing could be done in the region.

Türkiye's decisions within the Alliance, such as its initial opposition to Sweden's accession, further show the balance it maintains between the Alliance and its national interests. Like Hungary, Türkiye had an opposition to Sweden's NATO accession as Ankara criticized Sweden's support of terrorist groups seeking asylum in Sweden, which delayed Sweden's entry into the Alliance.[84] This stance drew criticism from other NATO members, who saw it as a barrier to strengthening collective security, especially amid heightened tensions with Russia. However, after Sweden addressed Türkiye's concerns by amending its constitution to bolster anti-terrorism laws and taking other relevant steps, Türkiye approved Sweden's accession. This episode underscores Türkiye's readiness to leverage its NATO position to address national security priorities, while also demonstrating its capacity to realign with NATO's interests when its demands are met.[85]

Officially, Türkiye is a party to the NPT and has signed and ratified the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Ankara's stated policy supports global disarmament and robust non-proliferation instruments. As a NATO member, Türkiye endorses Alliance statements that affirm the importance of nuclear deterrence and the potential use of nuclear weapons on its behalf as part of collective defence. Consistent with NATO's collective stance, Türkiye has not signed or ratified the Treaty on the Prohibition of Nuclear Weapons (TPNW) and has consistently voted against UN General Assembly resolutions promoting the TPNW, aligning itself with the US and other nuclear-hosting allies.[86]

With concerns about potential nuclear proliferation by neighbours, especially Iran, Türkiye also considers its geographical disadvantage in its security calculations. Some Turkish military and diplomatic circles have viewed the presence of NATO nuclear weapons on Turkish soil as a credible deterrent against such regional threats.[87] From the Iranian perspective, the US and NATO presence in the region, including the nuclear weapons in Türkiye, are interpreted as part of a broader Western strategy that is

[84] Adérito Vicente, Muhammed Ali Alkış, and Iryna Maksymenko, "The Impact of Russia's War against Ukraine on Finland and Sweden's Decision to Join NATO: Effects on the Global Nuclear Order," in *Russia's War on Ukraine: The Implications for the Global Nuclear Order*, ed. Adérito Vicente, Polina Sinovets, and Julien Theron (Cham: Springer Nature Switzerland, September 2023), 229–46, https://doi.org/10.1007/978-3-031-32221-1_16
[85] Ibid.
[86] Alkış, *Türkiye in the New World Order: The Nuclear Debate*, 4-8.
[87] Kibaroglu, "Reassessing the Role of U.S. Nuclear Weapons in Turkey."

designed to contain Iranian influence.[88] Despite this, Iran has also acknowledged and appreciated Türkiye's role in mediating nuclear negotiations between Tehran and Washington, underscoring the complex web of regional relationships in which Türkiye's nuclear-hosting role is embedded.

Conclusion

Türkiye's role in NATO's nuclear extended deterrence is undergoing a critical evolution. For decades, Ankara's contribution was defined by the active hosting of tactical nuclear weapons at Incirlik Air Base and the direct integration of its air force into nuclear strike missions. However, the exclusion from the F-35 program and the subsequent reliance on legacy platforms have created a capability gap that challenges this traditional posture. Combined with Ankara's pursuit of strategic autonomy and its transactional diplomacy with Russia, these factors introduce a layer of unpredictability that the Alliance must carefully manage to ensure cohesion on the Southern Flank.

The future of Türkiye's involvement in NATO's nuclear deterrence will likely remain characterized by a dynamic tension. Ankara will probably seek to retain the security guarantees and international status that participation in nuclear sharing requires. Its ambition for greater strategic autonomy and its willingness to engage in transactional diplomacy will continue. In return, this will require continuous and delicate management by NATO. Therefore, the Alliance must balance the need for reassurance and solidarity with clear expectations regarding commitments and interoperability. Moreover, NATO must pay greater attention to Türkiye's strategic and security needs, particularly by supporting its air force modernization and addressing regional threat perceptions, to ensure Ankara's steadfast commitment to the nuclear mission, especially given the implications of Russia's war against Ukraine for Europe.[89]

For NATO, Türkiye remains an indispensable but sometimes challenging ally. Ultimately, the credibility of extended deterrence in the Euro-Atlantic area does not rest solely on the host nation's kinetic capability to deliver the weapon. In the context of nuclear deterrence, symbolism often functions as

[88] Utku Çakırözer, *Iran's Threat to Regional and Euro-Atlantic Security* (April 16, 2025), https://www.nato-pa.int/document/2025-irans-threat-regional-and-euro-atlantic-security.
[89] Rebecca Lucas, "Turning Towards Turkey: Why NATO Needs to Lean into Its Relationship," *RAND Commentary*, March 18, 2025, https://www.rand.org/pubs/commentary/2025/03/18/turning-towards-turkey-why-nato-needs-to-lean.html.

substance. Even if Türkiye's role evolves from a direct delivery agent to a logistical host and conventional escort due to the F-35 exclusion, the presence of B61s at Incirlik remains fundamentally sufficient for deterrence. These weapons serve as an irremovable 'tripwire,' physically coupling US strategic assets to Turkish territory. This forces any potential adversary to calculate that a strike on Türkiye involves the risk of triggering a nuclear response, regardless of which specific airframe delivers the retaliation. Conversely, any initiative to withdraw these assets—regardless of the operational justification—would be strategically self-defeating. It would likely be perceived in Ankara as a tacit annulment of the extended deterrence guarantee, irreparably fracturing the political trust that underpins the Alliance's southeastern defence. Thus, the symbolic weight of the stockpile, combined with Türkiye's conventional escort capabilities, provides a political anchor that maintains the integrity of NATO's southern flank. Navigating this complex relationship is therefore not about restoring a past status quo, but about adapting the Alliance's nuclear architecture to a new reality where Türkiye's value is defined by its geostrategic indispensability and the powerful symbolism of its nuclear burden-sharing.

Semiconductors, Strategic Vulnerability and Selective Decoupling: China's Techno-Nationalist Response to US Restrictions

Sobia Hanif and Bazgha Murtaza*

Abstract

In the contemporary era marked by technological breakthroughs, advanced semiconductors are widely recognized as the "currency of power," with their control determining geopolitical leverage, national security, and digital supremacy. As the prime assets of modern economic and defence systems, command over high-end chips is redefining the power dynamics of the Twenty-first century. This study aims to investigate China's unprecedented push for technological self-sufficiency amid perceived vulnerabilities associated with its dependency on foreign sources for microchips and the weaponization of semiconductor value chains by the United States (US). This study examines the national security imperatives that shape states' behaviour in an anarchic system. Employing the qualitative case study approach, the study aims to investigate the significant ramifications of the US-China semiconductor rivalry for the stability of the global technopolitical and geopolitical order. Additionally, it aims to assess the policy approaches and national security priorities of China related to its techno-nationalist aspirations. The research findings reveal that the technological competition between the US and China is set to grow exponentially in transnational domains.

Keywords: Semiconductors, Techno-political Dynamics, US-China Tech war, Geopolitical Leverage

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Introduction

Semiconductors, widely recognized as the oil of the Twenty-first century, are the fundamental pillars of present technological advancements.[1] These microchips are manufactured from critical minerals and are capable of enabling a broad spectrum of essential tools ranging from consumer electronics to futuristic defence technologies.[2] Given their indispensable applications, they are regarded as geostrategic assets with their command becoming a crucial determinant for digital supremacy, economic resilience, national security, and global power.[3] The semiconductors have emerged as the central focus of the ongoing technological competition between the US and China, commonly referred to as the "chip war."[4] It revolves around the pursuit of technological supremacy.[5] At its core, this competition is a battle for dominance in the semiconductor sector.[6] The US holds a significant geopolitical control over the semiconductor supply chains by excelling in microchip fabrication, design, and software.[7] China, on the other hand, is aspiring to become a global technological hub and maintains an edge in the processing of critical earth minerals.[8] Viewing China's innovation imperative as a perceived threat, the US has imposed export restrictions on semiconductor-related technology on China.[9] Despite these attempts, China

[1] Chris Miller, *Chip War: The Fight for the World's Most Critical Technology* (New York: Simon & Schuster, 2022), 12, https://www.simonandschuster.com/books/Chip-War/Chris-Miller/9781982172008

[2] Kumar Priyadarshi, "7 Applications of Semiconductors in Daily Life," *TechoVedas*, October 8, 2023, https://techovedas.com/7-applications-of-semiconductors-in-daily-life/

[3] Robert Manning, "Emerging Technologies: New Challenges to Global Stability," Atlantic Council, May 1, 2020, http://www.jstor.org/stable/resrep26000

[4] Manal Hamdani and Ismail Belfencha, "Strategic Implications of the US-China Semiconductor Rivalry," *Discover Global Society* 2, no. 67 (2024): 2, https://doi.org/10.1007/s44282-024-00081-5

[5] Hemant Taneja and Fareed Zakaria, "AI and the New Digital Cold War," *Harvard Business Review*, September 6, 2023, https://hbr.org/2023/09/ai-and-the-new-digital-cold-war

[6] Drew Hooper, "Semiconductors & Geopolitics: Overview of Semiconductors Industry & US-China Geopolitics," Hooper Consulting, October 19, 2023, https://hooperco.org/semiconductors-and-geopolitics

[7] Qayyum Chaudhary, "Semi-Conductor Race in Indo Pacific," *Modern Diplomacy*, August 26, 2023, https://moderndiplomacy.eu/2023/08/26/semi-conductor-race-in-indo-pacific/

[8] Craig Hart, "Mapping China's Strategy for Rare Earths Dominance," Atlantic Council, June 2025, https://www.atlanticcouncil.org/wp-content/uploads/2025/06/Mapping-Chinas-strategy-for-rare-earths-dominance

[9] Hooper, Drew. "Semiconductors & Geopolitics: Overview of Semiconductors Industry & US-China Geopolitics." *Hooper Consulting*, October 19, 2023, https://hooperco.org/semiconductors-and-geopolitics

is focused on achieving semiconductor self-sufficiency through indigenous production to break free from external dependency.[10]

This paper aims to evaluate the dynamic nature of US-China semiconductor rivalry as the defining feature of contemporary global politics. It seeks to examine China's growing ambitions in fortifying its techno-security infrastructure by embracing domestic semiconductor production through state-backed investments. Furthermore, the study specifically investigates China's strategies for circumventing US semiconductor restrictions and developing local capacities to reduce its dependence on foreign supply chains.

China's Semiconductor Dilemma: Strategic Vulnerability Amid Foreign Dependence

In an era marked by innovative breakthroughs, the silicon-based advanced microchips are the fundamental imperatives of economic power and national security.[11] These critical miniature chips, manufactured from rare earth minerals like germanium, gallium, arsenic, and yttrium, are conductive to electricity under suitable conditions.[12] Possessing vast applications in advanced gadgets, they are central to electronic and digital technology. Furthermore, their dual-use nature, underpinning both economic prosperity and military superiority, has cemented microchips as the central arena for technopolitical rivalry. In the civilian sector, semiconductor chips enable a vast array of technological tools, including smartphones, televisions, electric vehicles, and laptops. They are also used in modern communication infrastructures that form the core foundation of the internet for driving global digital connections.[13] Equally critically, in the military sector, they are capable of enabling advanced weapon systems and

[10] "Xiconomics in Practice: How Xi Leads China in All-Out Effort to Tackle Tech 'Bottleneck' to Secure Development," *Global Times*, February 2, 2023, https://www.globaltimes.cn/page/202302/1284729.shtml

[11] Christopher Thomas, "A Semiconductor Strategy for the United States," Brookings Institution, November 2022, https://www.brookings.edu/articles/a-semiconductor-strategy-for-the-united-states.

[12] Liv McMahon and Shiona McCallum, "What Are Semiconductors and Why Is Trump Targeting Them?" *BBC*, April 14, 2025, https://www.bbc.com/news/technology-66394406

[13] Kumar Priyadarshi, "7 Applications of Semiconductors in Daily Life," *TechoVedas*, October 8, 2023, https://techovedas.com/7-applications-of-semiconductors-in-daily-life/

futuristic warfare technologies, thereby strengthening the strategic leverage of a state.[14]

Recognizing their versatile applicability, the cutting-edge semiconductor technology is currently shaping the trajectory of global tech regimes.[15] The US and China represent distinctive strengths in terms of semiconductor production, with the US leading in semiconductor design.[16] The worldwide Electronic Design Automation (EDA) market is heavily monopolized by the US-based software firms, mainly Synopsys, Siemens, and Cadence.[17] The EDA is a highly sensitive software that is used in fabricating and assembling sophisticated chips featuring billions of electronic components, thereby upgrading efficiency and minimizing design complexity.[18] In addition, the US has long maintained a competitive edge in semiconductor research and development through leading tech giants like Nvidia and Intel, which significantly contribute to advancing microchip technology.[19]

China, on the other hand, maintains a lead in software-driven innovation ecosystem and is experiencing rapid growth driven by the fusion of state-backed funding, a large pool of artificial intelligence (AI)-led data infrastructures, and private-sector innovation.[20] In 2017, China's Next Generation Artificial Intelligence Development Plan officially declared its goal to become a global leader in Artificial Intelligence by 2030. Its progress is evident in the emergence of DeepSeek, a leading Chinese AI

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[14] Sujai Shivakumar and Charles Wessner, "Semiconductors and National Defense: What Are the Stakes?" Center for Strategic & International Studies (CSIS), June 8, 2022, https://www.csis.org/analysis/semiconductors-and-national-defense-what-are-stakes

[15] Yue Wu, Jae Lung, and Kevin Tangonan, "U.S. Technological Decoupling from China: A Neoclassical Realist Explanation," *International Area Studies Review* 27, no. 3 (2024): 197–218, https://doi.org/10.69473/iasr.2024.27.3.197

[16] Hemant Taneja and Fareed Zakaria, "AI and the New Digital Cold War," *Harvard Business Review*, September 6, 2023, https://hbr.org/2023/09/ai-and-the-new-digital-cold-war

[17] Amandak, "Synopsys Accelerates Chip Design with NVIDIA Grace Blackwell and AI to Speed Electronic Design Automation," *SemiWiki* (forum thread), March 20, 2025, https://semiwiki.com/forum/threads/synopsys-accelerates-chip-design-with-nvidia-grace-blackwell-and-ai-to-speed-electronic-design-automation.22357

[18] Wei Xiong, David Wu, and Jeff Yeung, "Semiconductor Supply Chain Resilience and Disruption: Insights, Mitigation, and Future Directions," *International Journal of Production Research* (August 13, 2024), https://doi.org/10.1080/00207543.2024.2387074

[19] Timothy Costa, "Semiconductor Industry Accelerates Design Manufacturing With NVIDIA Blackwell and CUDA-X," NVIDIA Blog, May 18, 2025, https://blogs.nvidia.com/blog/semiconductor-industry-electronic-design-automation-blackwell-cuda-x

[20] Mark Greeven, "China and AI in 2025: What Global Executives Must Know to Stay Ahead," *Forbes*, December 23, 2024, https://www.forbes.com/sites/markgreeven/2024/12/23/china-and-ai-in-2025-what-global-executives-must-know-to-stay-ahead

Firm that surpassed US-based AI counterparts in terms of efficiency and performance.[21]

Despite possessing cutting-edge AI software infrastructures, China lags in the hardware domain, notably in advanced semiconductor chip fabrication.[22] This hardware deficit creates a fundamental constraint for China's AI strategic autonomy, making it heavily reliant on foreign chip markets for essential acquisitions. The majority of the semiconductor chips used in China's domestic electronic industries belong to the older generation due to its lack of indigenous production capacity for generating advanced chip nodes.[23] Before the enactment of the CHIPS Act by the US legislation in 2022, which aimed at bolstering domestic semiconductor manufacturing through substantial state-backed investments,[24] China imported approx--imately 83% of semiconductors from the US and its allies, including Japan, Australia, and Taiwan. However, after the US imposed restrictions on the export of semiconductors to China, its imports decreased by 10.8% in volume and 15.4% in value from these markets.[25] Despite being the world's largest semiconductor market, China fabricates only 30% of its indigenous semiconductors.[26] In essence, it is being ranked as the world's top consumer of semiconductors with the highest number of foreign providers for advanced chips that make up 70% of its domestic needs.[27]

China's heavy reliance on foreign supply chains for acquiring state-of-the-art semiconductor chips has raised significant concerns, particularly in the

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[21] Mark Craddock, "The AI Superpower Showdown: Inside the US-China Race for Technological Supremacy," *Medium*, January 28, 2025, https://medium.com/@mcraddock/inside-the-us-china-race-for-technological-supremacy-52cb5c3df063

[22] Stephen Ezell, "How Innovative Is China in Semiconductors?" Information Technology & Innovation Foundation (ITIF), August 19, 2024, https://itif.org/publications/2024/08/19/how-innovative-is-china-in-semiconductors

[23] Dwayne Woods, "The Silicon Sword Hanging Over China's Head," *Journal of Chinese Political Science* (March 5, 2024), https://doi.org/10.1007/s11366-024-09883-5

[24] Ed Barriball, "The CHIPS and Science Act: Here's What's in It," *McKinsey & Company*, October 4, 2022, https://www.mckinsey.com/industries/public-sector/our-insights/the-chips-and-science-act-heres-whats-in-it

[25] Che Pan, "Tech War: China Chip Imports Fall in 2023 but Semiconductors Remain Country's Largest Item Ahead of Crude Oil," *South China Morning Post*, January 12, 2024, https://www.scmp.com/tech/policy/article/3248269/tech-war-china-chip-imports-fall-2023-semiconductors-remain-countrys-largest-item-ahead-crude-oil

[26] U.S.-China Economic and Security Review Commission, "Made in China 2025: Evaluating China's Performance," November 14, 2025, https://www.uscc.gov/research/made-china-2025-evaluating-chinas-performance

[27] Masha Borak, "China Boosts Semiconductor Production in 2020, but Imports Keep Apace, Frustrating Self-Sufficiency Goals," *South China Morning Post*, January 19, 2021, https://www.scmp.com/tech/policy/article/3118327/china-boosts-semiconductor-production-2020-imports-keep-apace-frustrating-self-sufficiency-goals

US, regarding China's strategic doctrine of civil-military fusion (CMF), a national policy framework that integrates the deployment of high-tech chip technology in the defence sector.[28] The US policymakers are concerned about the potential misuse of cutting-edge technologies in military modernization beyond serving essential domestic digital infrastructure requirements. Moreover, China's joint ventures with foreign firms require tech-sharing in exchange for operating in the country. China has been accused by critics of having poor intellectual property (IP) regulations, resulting in IP theft and seizure of sensitive technical information from external companies.[29] Resultantly, these developments have contributed towards a reassessment of US policy towards China, indicating a calculated shift from collaboration towards containment.[30] Underscoring this strategic outlook, US Secretary of Commerce Gina Raimondo argued that the US will not let China lead this highly critical industry that is deeply associated with US economic resilience and state security.[31] Amid these concerns, the US began imposing strict export restrictions through measures like entity lists, foreign direct product rule, and export licensing requirements, thereby targeting its high-tech sector. These efforts, in particular, targeted China's access to chip-making tools to limit its growing ambitions in the technopolitical arena.[32] The effectiveness of the export restriction regimes is apparent in the notable decline of the US's high-tech exports for chipmaking equipment to China over the years that followed this calculated effort.[33]

Vulnerabilities associated with microchip dependency on external sources and the weaponization of semiconductor supply chains by the US have pushed China to pursue a more defensive strategy in order to reduce reliance

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[28] Ming Chu, "China's Defence Semiconductor Industrial Base in an Age of Globalisation: Cross-Strait Dynamics and Regional Security Implications," *Journal of Strategic Studies* 47, no. 5 (2024): 643–68, https://doi.org/10.1080/01402390.2023.2164852

[29] Pablo Fajgelbaum and Amit Khandelwal, "Economic Impacts of the US-China Trade War," National Bureau of Economic Research, December 2021, https://www.nber.org/papers/w29315

[30] Tao Liu and Wing Thye Woo, "Understanding the U.S.-China Trade War," *China Economic Journal* (July 6, 2018), https://doi.org/10.1080/17538963.2018.1516256

[31] Manal Hamdani and Ismail Belfencha, "Strategic Implications of the US-China Semiconductor Rivalry," *Discover Global Society* 2, no. 67 (2024): 2, https://doi.org/10.1007/s44282-024-00081-5

[32] Joseph Waring, "Analysis: Is US Squeeze on China Bolstering Its Self-Sufficiency?" *Mobile World Live*, December 12, 2024, https://www.mobileworldlive.com/huawei/analysis-is-us-squeeze-on-china-bolstering-its-self-sufficiency/

[33] "Chip Equipment Export to China Tumble as U.S. Pushes Decoupling," *Nikkei Asia*, March 29, 2023, https://asia.nikkei.com/Business/Tech/Semiconductors/Chip-equipment-exports-to-China-tumble-as-U.S.-pushes-decoupling

on imported microchip technology.[34] For this purpose, the Chinese government has adopted two approaches. Firstly, it became a strategic necessity to reduce reliance on foreign technology by developing all Chinese-centred chip manufacturing through indigenous production and self-sufficiency. Secondly, the Chinese Government aimed to secure alternative supply chains hosted by friendly nations and eventually possess and control all the segments of the supply chain independently.[35] To make these objectives realistic and achievable, the Chinese Government implemented a combination of policies, including tax incentives and subsidies for domestic semiconductor firms, research and development investments, and state-led funding through initiatives like Made in China (MIC) 2025 and the Big Fund. Additionally, it aimed at solidifying its control on the exports of rare earth minerals used in high-tech manufacturing while circumventing the critical US technology through third countries.[36] These efforts underscore China's ambitions to achieve self-sufficiency in the semiconductor sector and to decouple from foreign dependencies.[37]

Made in China 2025 Initiative

China's strategic vision aims at achieving breakthroughs in emerging technologies to drive rapid economic and defence upgradation. Indeed, Chinese President Xi Jinping has declared that securing the critical infrastructure in the digital age is central to China's national security and economic strength. Development of advanced semiconductor chips remains the nation's top innovation priority. In order to achieve this, China would have to produce cutting-edge semiconductor technology domestically.[38] Despite China's early tech dependency on foreign sources, its commitments to reduce this reliance began producing tangible outcomes even before the issuance of official legislative frameworks. This is evident in China's

[34] "Xiconomics in Practice: How Xi Leads China in All-Out Effort to Tackle Tech 'Bottleneck' to Secure Development," *Global Times*, February 2, 2023, https://www.globaltimes.cn/page/202302/1284729.shtml

[35] Dwayne Woods, "The Silicon Sword Hanging Over China's Head," *Journal of Chinese Political Science* (March 5, 2024), https://doi.org/10.1007/s11366-024-09883-5

[36] Sujai Shivakumar, Charles Wessner, and Thomas Howell, "The Limits of Chip Export Controls in Meeting the China Challenge," Center for Strategic and International Studies (CSIS), April 14, 2025, https://www.csis.org/analysis/limits-chip-export-controls-meeting-china-challenge

[37] Philippe Legrain, "Why China Will Win the Trade War," *Foreign Policy*, April 13, 2018, https://foreignpolicy.com/2018/04/13/why-china-will-win-the-trade-war

[38] John VerWey, "Chinese Semiconductor Industrial Policy: Past and Present," *Journal of International Commerce and Economics* (July 2019), https://www.usitc.gov/publications/332/journals/chinese_semiconductor_industrial_policy_past_and_present_jice_july_2019

rapidly increasing shares across the global semiconductor value chain that surged from 8% to 31% between 2001 and 2016, reflecting its growing recognition of high-tech chips as an absolute necessity.[39]

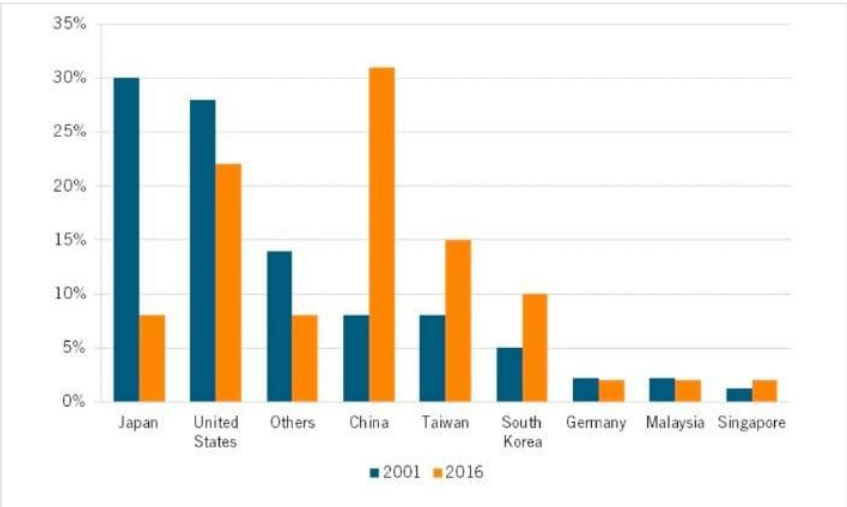

Figure 1: Net Production of Semiconductors in Global Tech Landscape (2001-2016)
Source: Ezell, Stephen. "How Innovative Is China in Semiconductors?" Information Technology and Innovation Foundation, Aug 19, 2024.

To institutionalize and keep up the momentum, the Chinese leadership has undertaken long-term policy initiatives for achieving the ultimate goal of self-sufficiency.[40] Central to this effort is the Made in China 2025 Initiative, a comprehensive industrial policy framework, launched by then Prime Minister Li Keqiang in 2015, that seeks to transform China into a global technological hub within a span of 10 years.[41] In particular, the MIC 2025 emphasizes modernizing industrial capacity through tech advancements.[42] Ten key sectors have been identified for industrial upgradation that include emerging technologies, aerospace, high-tech shipping, advanced medical devices, agricultural products, electrical tools, robotics, railway equipment, energy-efficient vehicles, and new materials. Altogether, these sectors make

[39] Stephen Ezell, "How Innovative Is China in Semiconductors?" Information Technology and Innovation Foundation (ITIF), August 19, 2024, https://itif.org/publications/2024/08/19/how-innovative-is-china-in-semiconductors
[40] Emily Jin, "A Policymaker's Guide to China's Technology Security Strategy," Information Technology and Innovation Foundation (ITIF), February 18, 2025, https://itif.org/publications/2025/02/18/a-policymakers-guide-to-chinas-technology-security-strategy
[41] "Made in China 2025," Institute for Security and Development Policy, June 2018, https://isdp.eu/wp-content/uploads/2018/06/Made-in-China
[42] Scott Kennedy, "Made in China 2025," Center for Strategic and International Studies (CSIS), June 1, 2015, https://www.csis.org/analysis/made-china-2025

up approximately 40% of China's global manufacturing output.[43] Acknowledging the integral role of advanced microchips in the hardware-driven semiconductor ecosystem, the strategic blueprint outlined the targeted ambition of securing a 70% self-sufficiency rate in semiconductor chip fabrication domestically by 2025.[44] In essence, the plan aimed to minimize dependency on external actors for advanced chips by embracing indigenous innovation in critical sectors that are deeply associated with national strength and digital competitiveness.[45]

Despite the ambitious goal of achieving 70% self-sufficiency in the semiconductor industry, China was able to achieve only 23.3% by 2023.[46] By the end of 2025, it is expected to reach around 30% according to projections.[47] This indicates a significant gap from the initial target due to its persistent reliance on foreign firms for advanced chip manufacturing tools, lack of skilled workforce for designing high-end chip nodes, and the mounting US export restrictions.[48]

[43] Jost Wübbeke et al., "Made in China 2025: The Making of a High-Tech Superpower and Consequences for Industrial Countries," MERICS, August 12, 2016, https://merics.org/en/report/made-china-2025

[44] "Was Made in China 2025 Successful?" U.S. Chamber of Commerce, May 5, 2025, https://www.uschamber.com/international/report-was-made-in-china-2025-successful

[45] James McBride and Andrew Chatzky, "Is 'Made in China 2025' a Threat to Global Trade?" Council on Foreign Relations, May 13, 2019, https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade

[46] Chen Tung, "China's Semiconductor Self-Sufficiency Below 25%, Focused on Mature Process Chips," LinkedIn post, October 2023, https://www.linkedin.com/posts/tungchenyuan_chinas-semiconductor-selfsufficiency-below-activity-7273002417497989120-ZI9H

[47] U.S.-China Economic and Security Review Commission, "Made in China 2025: Evaluating China's Performance," November 14, 2025, https://www.uscc.gov/research/made-china-2025-evaluating-chinas-performance

[48] Reva Goujon, Jan Kleinhans, and Laura Gormley, "Thin Ice: US Pathways to Regulating China-Sourced Legacy Chips," Rhodium Group, May 13, 2024, https://rhg.com/research/thin-ice-us-pathways-to-regulating-china-sourced-legacy-chips

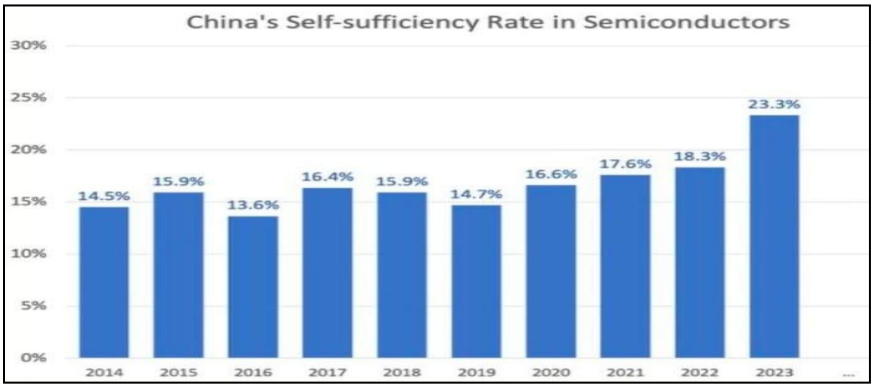

Figure 2: China's Semiconductor Self-Sufficiency Rate (2014-2023)
Source: Tung, Chen. 'China's Semiconductor Self-Sufficiency Below 25%, Focused on Mature Process Chips.' Tech Nights, Oct 2023.

Though China's self-sufficiency remains limited, a noticeable improvement is being observed in its domestic production capacity for legacy chips, which surged by 15% in 2024. In addition, its 2025 projections indicate a further rise by 14% which is likely to be one-third of global chip-making capacity.[49] Notably, Chinese high-tech firm Huawei yielded rates up to 40% in AI chip production in 2024. However, due to mounting export restrictions on advanced AI chips by President Trump in 2025, Huawei's founder, Ren Zhengfei, argued that Huawei's latest Ascend chip is one generation behind Nvidia's AI chips. In short, these developments underscore China's efforts and capacity in its growth in chip production through state-led subsidies for domestic firms to tackle the impact of mounting US export restrictions.[50]

China's Strategic Shift Towards State-Backed Investments: The Big Fund

Acknowledging the indispensable value of semiconductors in the geoeconomic arena, the Chinese leadership forged ahead in strengthening its domestic tech capabilities with a geopolitical vision of establishing an innovative and resilient high-tech infrastructure. This was further emphasized by the Chinese President Xi Jinping, who stressed the need to promote self-reliance and self-refinement, and to provide innovative

[49] SEMI, "Global Semiconductor Fab Capacity Projected to Expand 6% in 2024 and 7% in 2025, SEMI Reports," press release (Milpitas, CA), June 18, 2024, https://www.semi.org/en/news-media-press-releases/semi-press-releases/global-semiconductor-fab-capacity-projected-to-expand-6%25-in-2024-and-7%25-in-2025-semi-reports
[50] Paige West, "Global Semiconductor Fab Capacity Projected to Expand 6%," *Procurement Pro*, June 19, 2024, https://procurementpro.com/global-semiconductor-fab-capacity-projected-to-expand-

solutions to 'bottleneck' problems that hinder China's technological goals.[51] To put this vision into action, the Chinese Government launched the National Security Industry Investment Fund (NSIIF), also known as the 'Big Fund,' in 2014. It is a state-owned strategic investment fund that allocates substantial amounts of finance to Chinese domestic high-tech firms with a central objective of advancing the semiconductor industry and endorsing indigenous microchip production.[52]

In particular, the operational assessment and regulatory framework are carried out in a structured way. For example, the Ministry of Industry and Information Technology (MIIT) and the Ministry of Finance (MOF) jointly manage the policy direction of the fund by ensuring that its financial allocations align with the national industrial policy frameworks. The investment decisions are supervised by the China Development Bank, which is a major shareholder in this fund.[53]

The implementation mechanism of this fund has been executed through a phased approach with each phase reflecting a specific timeline, financial commitments, sectoral priorities, and key targeted objectives that are aimed at securing China's high-tech advancements.[54] The first phase of the Big Fund was officially launched in September 2014, with a capital investment of over 138.72 billion yuan. Its priority areas were raw materials, specialized equipment, microchip fabrication, designing, and packaging. The target was to upgrade China's indigenous technical foundations. To achieve this, the Fund allotted 65% of the grants to domestic chip-making fabs like Semiconductor Manufacturing International Corporation (SMIC) and Yangtze Memory Technologies Corporation (YMTC). In addition, 17% of the investments were directed to the firms dealing with designing semiconductor chips, 10% was allocated to the testing and packaging sector,

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[51] "Xiconomics in Practice: How Xi Leads China in All-Out Effort to Tackle Tech 'Bottleneck' to Secure Development," *Global Times*, February 2, 2023, https://www.globaltimes.cn/page/202302/1284729.shtml

[52] Baosi Meng, Jinxin Yao, and Xun Wu, "Misalignment and Unintended Consequences: Unraveling Governance Challenges in China's National Integrated Circuit Industry Investment Fund," *Science and Public Policy* (March 10, 2025), https://doi.org/10.1093/scipol/scaf005

[53] Lizzie Lee, "China's Big Fund 3.0: Xi's Boldest Gamble Yet for Chip Supremacy," *The Diplomat*, June 6, 2024, https://thediplomat.com/2024/06/chinas-big-fund-3-0-xis-boldest-gamble-yet-for-chip-supremacy/

[54] "China's Big Fund Phase Three Commences, Injecting 344 Billion RMB into Semiconductor Industry Growth," *TrendForce*, May 27, 2024, https://www.trendforce.com/news/2024/05/27/news-chinas-big-fund-phase-three-commences-injecting-344-billion-rmb-into-semiconductor-industry-growth/

and the remaining 4% was funnelled to equipment and material separately.[55] Phase I of this plan was operationalized till 2019. Resultantly, the major catalytic effect was that China achieved significant growth in domestic fab capacity and equipment manufacturing.[56]

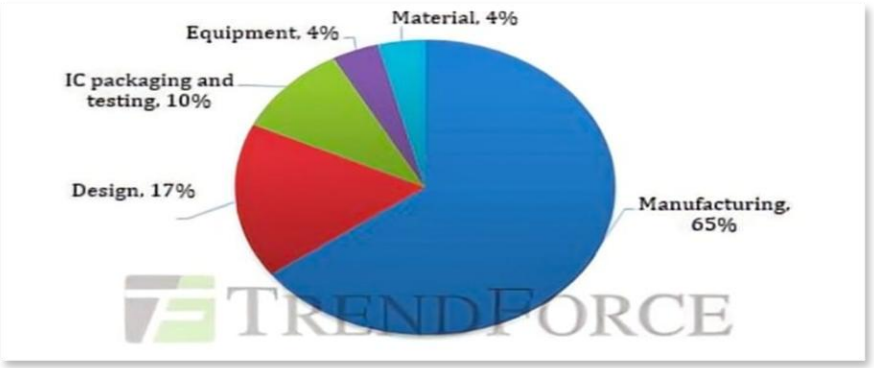

Figure 3: Big Funds' Contribution to China's Domestic Semiconductor Sector
Source: Jeter Teo, "TrendForce Says the Chinese Government Continues 'Big Fund' to Support Key Semiconductor Sectors in China, including Memory and IC Design," TrendForce, November 21, 2017.

Following the success of the first phase of Big Fund, the Chinese leadership launched its second phase in October 2019. This time, the capital investment was increased to approximately 204.2 billion yuan, from which 75% of the fiscal investment was allotted to wafer fabrication, 15% to semiconductor equipment and material, and the remaining 10% was designated to chip designing, packaging, and testing.[57] In response to the export restrictions imposed by the US on China, this phase invested about 60 billion yuan in more than forty domestic semiconductor firms in China with an aim of accelerating chip manufacturing capacity.[58]

The key achievement of Big Funds' investments underscores substantial growth in revenues of the integrated circuit (IC) industry across three major sectors, including IC design, IC manufacturing, and IC testing and

[55] Jeter Teo, "TrendForce Says the Chinese Government Continues 'Big Fund' to Support Key Semiconductor Sectors in China Including Memory and IC Design," *TrendForce*, November 21, 2017, https://www.trendforce.com/presscenter/news/20171121-9918.html
[56] "SMIC Receives Investment from China Integrated Circuit Industry Investment Fund," SMIC, February 13, 2015, https://www.smics.com/en/site/news_read/4541
[57] "China's National Chip Fund Raises $48bn to Help Local Firms," *Evertiq*, May 28, 2024, https://evertiq.com/news/55792
[58] Ma Jingjing, "China's 'Big Fund II' Makes Intensive Investments, As Country Aims to Overcome US Chip Ban," *Global Times*, March 30, 2023, https://www.globaltimes.cn/page/202303/1288294.shtml

packaging. Significant gains were noticed from 2019-2024, which reflect the direct impact of increased investment under phase II of the Big Fund.[59]

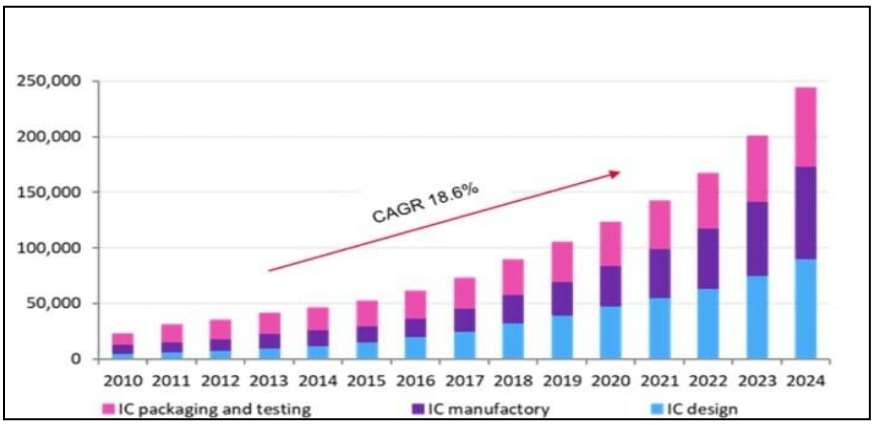

Figure 4: China IC Industry Revenue Development Trend
Source: "China's 28nm Chip Process Industry Set to Achieve Self-Reliance Within Two Years," Omdia, November 10, 2020.

In order to achieve higher rates of self-sufficiency in the semiconductor industry, Chinese leadership proceeded further and launched the third phase of Big Fund in May 2024, with a capital investment of over 344 billion yuan. It is the current and largest investment phase of the Big Fund that spans over 15 years. Priority areas for this phase are emerging technologies, supply chain resilience, advanced chip fabrication, and specialized semiconductor material.[60]These investments are viewed as a countermeasure to the US's CHIPS and Science Act, which allocates substantial funding for domestic chip fabrication in the US. In response to this, Phase II of the Big Fund explicitly focuses on supply chain robustness and advanced chip-nodes, which are crucial elements for China's technological aspirations.[61] Long-term strategic investments are aimed at increasing the competitiveness of the Chinese IC industry globally. In essence, this fund is playing a fundamental role in advancing China's

[59] "China's 28nm Chip Process Industry Set to Achieve Self-Reliance Within Two Years," *Omdia*, November 10, 2020, https://omdia.tech.informa.com/om014575/chinas-28nm-chip-process-industry-set-to-achieve-self-reliance-within-two-years
[60] "China Sets up Third Fund with $47.5 bln to Boost Semiconductor Sector," *Reuters*, May 27, 2024, https://www.reuters.com/technology/china-sets-up-475-bln-state-fund-boost-semiconductor-industry-2024-05-27/
[61] Joane, "China Launches $47.5 Billion Big Fund III to Boost Semiconductor Self-Sufficiency," *Gizmochina*, May 30, 2024, https://www.gizmochina.com/2024/05/30/china-launches-47-5-billion-big-fund-iii-to-boost-semiconductor-self-sufficiency

ambition to become a leading tech-power by strengthening a Chinese-centred tech architecture.[62]

Circumventing US Semiconductor Technology Via Third Parties

In October 2022, the US enforced strict export bans on China to limit its technological ambitions by restricting the supply of leading semiconductor chips and sophisticated chip-making equipment, which were essential for China's technological rise.[63] Despite the export restriction regimes, China has made significant strides in accessing next-generation semiconductor chips, which are vital for emerging technologies via third countries.[64]

Singapore is the leading exporter of semiconductor-related technology like lithography machines, deposition equipment, and wafer cleaning tools to China. In 2023, it exported $6.4 billion worth of US-origin chip-making equipment to China. Malaysia, on the other hand, exported $23 million worth of chip-related technology to China.[65] Taiwan, the global chip manufacturer, exported $90.4 billion worth of ICs, the finished semiconductor, to China. Recently, with the advent of the Chinese AI firm Deepseek, the investigations have revealed that the sophisticated H800 AI chips manufactured by the US tech giant Nvidia were initially shipped to Singapore and were exported to China.[66] In essence, the third countries enable China to indirectly procure restricted items and, hence, act as a gateway for technology transfer. The US authorities are responding to these unauthorized technological transfers stringently. Consequently, in May 2025, the US's law-making authorities passed a bill called the CHIPS Security Act to halt the illegal smuggling of Nvidia's cutting-edge chip nodes to China. The key provision of this bill calls for the imposition of harsh penalties on individuals involved in an illicit tech transfer. Additionally, it has proposed tracking mechanisms for exporting Nvidia's

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[62] Win Min and Han Wei, "China Piles $47.5 Billion Into 'Big Fund III' to Boost Chip Development," *Caixin Global*, May 28, 2024, https://www.caixinglobal.com/2024-05-28/china-piles-475-billion-into-big-fund-iii-to-boost-chip-development-102200633.html

[63] U.S. Congressional Research Service, Foreign Affairs, Defense, and Trade Division, *U.S.-China Technological "Decoupling"* (Washington, DC: Congressional Research Service, 2022).

[64] Sebastian Strangio, "Malaysia to Tighten Chip Controls After Pressure From US, Report Says," *The Diplomat*, March 25, 2025, https://thediplomat.com/2025/03/malaysia-to-tighten-chip-controls-after-pressure-from-us-report-says/

[65] Maria Wihardja and George Tan, "Will Southeast Asian Countries Pass the US' Heightened Export Controls?" *FULCRUM*, January 22, 2025, https://fulcrum.sg/will-southeast-asian-countries-pass-the-uss-heightened-export-controls/

[66] Willow Tohi, "Chinese Espionage? China's DeepSeek May Have Exploited Singapore to Obtain Nvidia Chips," *NewsTarget*, February 5, 2025, https://www.newstarget.com/2025-02-05-chinas-deepseek-may-have-exploited-singapore

chips by incorporating location-tracking technology within the chips. This legislative bill aims to curb China's technological progression, notably in application-specific integrated circuits.[67]

Taiwan's Semiconductor Manufacturing Company (TSMC) is the world's leading chip fabrication facility, which plays a significant role in global value chains.[68] By early 2025, TSMC shipped thousands of chips to China's domestic tech giant Huawei, despite its presence on the US Entity List. It sparked a huge concern in the US regarding non-compliance with the existing export restriction regimes. However, the US Department of Commerce issued an order to TSMC to halt further shipment of chips to China.[69] The Netherlands, on the other hand, is home to Advanced Semiconductor Materials Lithography (ASML), a Dutch company that retains a significant monopoly in producing and supplying Extreme Ultraviolet (EUV) lithographic machines. These machines are widely used in the fabrication of cutting-edge chips, which are below 7nm. While ASML is not allowed to provide high-end chip production machines to China, it still exports older-generation lithographic machines under the Dutch Government licenses, some of which have been revoked recently at the request of the US Government.[70] Despite the US attempts to hinder China's access to sensitive AI technology, China's growing ambitions in bolstering its technical capabilities through indigenous semiconductor production, state-backed investments, and acquisition of the critical US technology through intermediary nations highlight its efforts in achieving technological self-sufficiency.[71]

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[67] Mackenzie Ferguson, "US Lawmaker Cracks Down on Nvidia Chip Smuggling to China with New Bill," *Open Tools*, May 5, 2025, https://opentools.ai/news/us-lawmaker-cracks-down-on-nvidia-chip-smuggling-to-china-with-new-bill

[68] John Clements, "Semiconductor Geopolitics: The Strategic Role of Taiwan and Global Supply Chain Tensions," *The Looking Glass*, March 2, 2025, https://johnclements.com/the-looking-glass/business-strategy/taiwan-semiconductor-geopolitics/

[69] Karen Freifeld, "Report of TSMC Chips that Went to Huawei 'Huge Concern,' US Commerce Nominee Says," *Reuters*, February 27, 2025, https://www.reuters.com/technology/report-tsmc-chips-made-huawei-huge-concern-us-commerce-nominee-says

[70] Jack Simpson, "ASML Halts Hi-Tech Chip-Making Exports to China Reportedly After US Request," *The Guardian*, January 2, 2024, https://www.theguardian.com/technology/2024/jan/02/asml-halts-hi-tech-chip-making-exports-to-china-reportedly-after-us-request

[71] Qayyum Chaudhary, "Semi Conductor Race in Indo Pacific," *Modern Diplomacy*, August 26, 2023, https://moderndiplomacy.eu/2023/08/26/semi-conductor-race-in-indo-pacific/

China's Control Over Rare Earth Elements

Rare Earth Elements (REEs) are a group of 17 naturally occurring earth elements that encompass 15 lanthanide metals, along with two additional elements, yttrium and scandium.[72] Rare Earth Elements share their chemical properties with each other and are often present in the same geological mineral seams. Contrary to their name, they are not naturally scarce. In fact, they are rarely discovered in concentrated form that requires advanced extraction and refining techniques in order to obtain a usable rare earth element from within mineral deposits. In fact, it is the cost of extraction and refinement that makes them strategically valuable in the global value chains. As rare earth minerals are limited due to advanced refining and processing operations, this exacerbates dependencies and vulnerabilities.[73] They are essential metallic minerals and have a vast array of applications in defence systems, automotive industries, electronic industries, green technology, radar systems, medical devices, and computer hard drives.[74]

Moreover, they are typically used in the fabrication of advanced semiconductor chips and are at the cornerstone of contemporary technological advancements. The global Rare Earth industrial landscape is heavily monopolized by China. In the current geoeconomic sphere, China is regarded as the production hub for critical rare earth minerals. It retains significant geopolitical leverage over rare earths supply chains by specializing in large-scale mining and cutting-edge refining apparatus.[75] In particular, it has nearly 37% of natural rare earth reserves, 69.77% of production capacity, and 90% of refining and processing potential. Moreover, low production costs and advanced processing facilities have positioned China as a key player in this critical sector.[76]

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[72] Jason Burton, "US Geological Survey Releases 2022 List of Critical Minerals," U.S. Geological Survey, February 22, 2022, https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals

[73] John Zadeh, "Navigating the Critical Minerals Race: Supply Chain Geopolitics," *Discovery Alert*, April 15, 2025, https://discoveryalert.com.au/news/critical-minerals-us-china-competition-2025

[74] Neha Mishra, "Defence and Civilian Applications of Rare Earth Elements," *Journal of Air Power and Space Studies* 17, no. 3 (2022): 128–145, https://capsindia.org/wp-content/uploads/2023/01/APJ-Jul-Sep-2022

[75] Hemant Taneja and Fareed Zakaria, "AI and the New Digital Cold War," *Harvard Business Review*, September 6, 2023, https://hbr.org/2023/09/ai-and-the-new-digital-cold-war

[76] Madhumitha Jaganmohan, "Distribution of Rare Earths Production Worldwide as of 2024, by Country," *Statista*, February 25, 2025, https://www.statista.com/statistics/270277/mining-of-rare-earths-by-country.

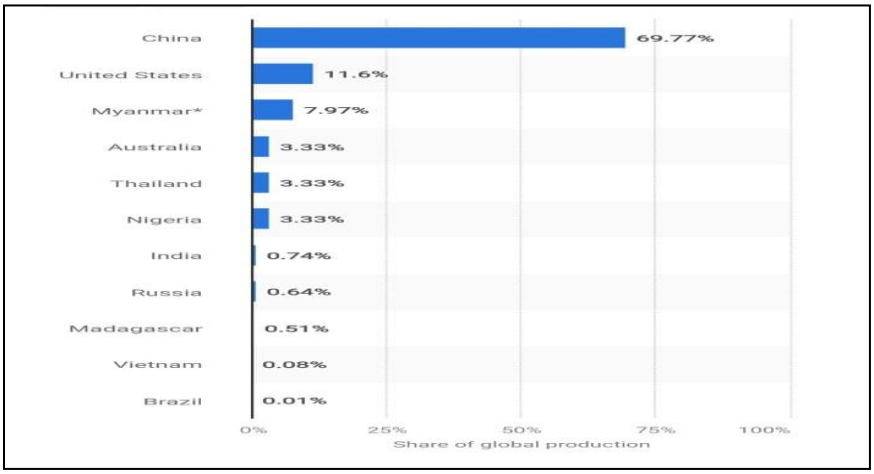

Figure 5: Rare Earths: Production Share by Country 2024
Source: Madhumitha Jaganmohan, "Distribution of Rare Earths Production Worldwide as of 2024, by Country," Statista, February 25, 2025.

China's largest, rare earths production firm is the China Rare Earth Group Co., Ltd. which is a combination of three state-owned mega firms that include, China Southern Rare Earth Group Co. Ltd., Chinalco Rare Earth and Metals Co., and China Minmetals Rare Earth Co. This firm is responsible for 60-70% of rare earths production and contributes approximately 30-40% of CRM to global supply networks.[77]

The US, on the other hand, holds 11.6% of rare earth reserves.[78] California's Mountain Pass Mine is the only plant in the US that is accountable for the extraction of rare earth minerals, but it lacks refining and processing apparatus. This technological gap compels the US to export its extracted minerals to China for further processing and refinement.[79] In 2024, more than 70% of its rare earth imports were sourced from China, which reflects a high level of economic dependency.[80] The West, for a long time, did not venture into the processing and refinement of these rare earth minerals because they produce radioactive waste and toxins. To address this issue,

[77] Qian Zhou and Sofia Brooke, "China Merges Three Rare Earths State-Owned Entities to Increase Pricing Power and Efficiency," *China Briefing*, January 12, 2022, https://www.china-briefing.com/news/china-merges-three-rare-earths-state-owned-entities-to-increase-pricing-power-and-efficiency
[78] Jaganmohan "Distribution of rare earths production worldwide as of 2024, by country."
[79] Funk, Josh. "The US Has a Single Rare Earths Mine. Chinese Export Limits Are Energizing a Push for More." *AP News*, April 18, 2025, https://apnews.com/article/rare-earths-trump-tariffs-china-trade-war-effd6a7ec64b5830df9d3c76ab9b607a
[80] Richter, Felix. "The U.S. Relies Heavily on Rare Earth Imports From China." *Statista*, April 14, 2025, https://www.statista.com/chart/34301/us-rare-earth-imports/

China has maintained a significant edge by incorporating environmental safety measures in rare earths. In October 2024, it launched the world's largest rare earths refining plant, named 'Northern Rare Earths Green Smelting Upgrade and Transformation Project' in Baotou. This facility has been regarded as a 'Quality Powerhouse Enterprise' because of its environmental stewardship approach in regard to rare earths' processing and refinement.[81]

As contemporary geopolitics are marked by the technological contest between the US and China, heavy reliance on the rival state generates vulnerabilities and economic risks.[82] Following the US' export restrictions on semiconductor chips, China strategically responded by restricting the supply of rare earth minerals, which represents a form of resource nationalism, where the critical resources are used as a tool for geopolitical leverage in order to advance national interest against perceived vulnerabilities.[83]

Implications for the Global Techno-political Order

The emergence of China as a systematic tech rival poses an enduring challenge to the long-standing leadership of the US in the high-tech sector.[84] This contestation is fundamentally geopolitical and has the potential to redefine the prevailing techno-political order.[85] Escalating technological frictions between the two major powers underscore the probability of decoupling efforts, particularly in critical security areas.[86] Given the scale of economic interdependence between the US and China, absolute

[81] "World's Largest Rare-Earth Raw Material Production Base Now Operational in North China." *Global Times*, October 16, 2024, https://www.globaltimes.cn/page/202410/1321307

[82] Jackson, Lewis, Amy Lv, Eric Onstad, and Ernest Scheyder. "China Hits Back at US Tariffs With Export Controls on Key Rare Earths." *Reuters*, April 5, 2025, https://www.reuters.com/world/china-hits-back-us-tariffs-with-rare-earth-export-controls-2025-04-04/

[83] Darabshaw, Sohrab. "Is China Using Rare Earths as Its Most Powerful Trade Weapon Yet?" *MetalMiner*, April 22, 2025, https://agmetalminer.com/2025/04/22/china-rare-earths-trade-weapon/.

[84] Brown, Michael. "U.S.–China Competition: The Battle for Global Technological Leadership." *Council on Global Competition and Innovation*, May 1, 2025, https://cgci.org/resources/u-s-china-competition-the-battle-for-global-technological-leadership/

[85] Hooper, Drew. "Semiconductors & Geopolitics: Overview of Semiconductors Industry & US–China Geopolitics." *Hooper Consulting*, October 19, 2023, https://hooperco.org/semiconductors-and-geopolitics

[86] Lardy, Nicholas. "Is US–China Decoupling Heading in a Dangerous Direction?" *East Asia Forum*, July 7, 2023, https://www.eastasiaforum.org/2023/07/07/is-us-china-decoupling-heading-in-a-dangerous-direction/

decoupling marked by complete economic severance seems to be unrealistic and practically unfeasible.[87]

According to assessments by the International Monetary Fund (IMF), the combined economies of the US and China comprise 43% of the global GDP and nearly half of global production capacity.[88] Moreover, both countries continue to rank among each other's largest trading partners, reflecting deep and enduring interdependence.[89] Given these realities, absolute decoupling would have far-reaching implications[90] including disruptions of the supply chains and increased possibilities of sparking a global economic recession due to their major contribution to worldwide production outputs.[91]

Recognizing the risks associated with absolute decoupling, the US and China are navigating the tech-based rivalry by pursuing a targeted decoupling approach, which entails a selective and focused disengagement in sectoral domains like foundational and dual-use technologies.[92] As emphasized by the US Secretary of the Treasury, Janet Yellen, the US does not seek broad economic disengagement but instead aims to pursue an approach that safeguards its national security interests. Hence, the present strategy avoids severance with China across the entire economic spectrum, instead seeking limited decoupling in critical techno-security infrastructure.[93]

US-China decoupling carries significant implications as it paves the way for the fragmentation of the global technological landscape.[94] This development is giving rise to the creation of two alternative and competing

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[87] Ren, Yuxiang, and Wang Weimin. "U.S. Decoupling from China: Strategic Logic, Trend, and Measures." *The Frontiers of Society, Science and Technology* 4, no. 12 (2022): 47–54, https://doi.org/10.25236/FSST.2022.041206

[88] Rao, Pallavi. "The $115 Trillion World Economy in One Chart." *Visual Capitalist*, December 19, 2024, https://www.visualcapitalist.com/the-115-trillion-world-economy-in-one-chart/

[89] "The U.S.-China Trade Relationship." *Council on Foreign Relations*, October 31, 2025, https://www.cfr.org/backgrounder/contentious-us-china-trade-relationship

[90] Park, Yong. "US–China Strategic Competition Amidst the Paradox of Decoupling." *International Journal for Social Science Studies* 12, no. 1 (2023): 4, https://doi.org/10.11114/ijsss.v12i1.6377

[91] Feingold, Spencer, and Lea Weibel. "How Might Economic Decoupling or De-risking Impact the Global Economy." *World Economic Forum*, June 27, 2023, https://www.weforum.org/agenda/2023/06/global-economic-decoupling-derisking-experts-explain/

[92] Hwang, Tim, and Emily Weinstein. "Decoupling in Strategic Technologies." *Center for Security and Emerging Technology*, July 2022, https://cset.georgetown.edu/publication/decoupling-in-strategic-technologies/

[93] United States, Department of the Treasury. *Remarks by Secretary of the Treasury Janet L. Yellen on the U.S.–China Economic Relationship*. Washington, DC: Department of the Treasury, 2023.

[94] Herrero, Alicia. "US–China Tech Bifurcation." *Bruegel*, May 10, 2023, https://www.bruegel.org/podcast/us-china-tech-bifurcation

technological spheres of influence led by the US and China separately.[95] The US promotes a democratic and rule-based technological ecosystem by seeking allied cooperation.[96] China, on the other hand, advocates for an all-Chinese-centred technological regime through indigenous production and self-sufficiency.[97] This bifurcation poses serious challenges for third-world countries, which are compelled to navigate competing standards and strategic alignments amidst intensifying geopolitical rivalry marked by technological contestations.[98] Maintaining strategic autonomy and multi-alignment for middle and emerging powers is also likely to become difficult as they face mounting pressure to choose sides amongst competing technological blocs. The tech-bifurcation also risks adversely impacting global innovation ecosystems, thereby deepening inequalities between technologically advanced and lagging states, and reshaping the global order along competing technological, economic, and strategic lines.

Conclusion

The growing friction between the US and China is reshaping the technological order of the twenty-first century. This rivalry, at its core, is geopolitical in nature as both states are strengthening their assets and making efforts to reduce reliance on foreign sources. Following the US' tech containment strategy, China, driven by its innovation imperative, has intensified efforts at bolstering indigenous semiconductor production. It is investing in the production of domestic semiconductor chips through state-led initiatives. It also maintains a strategic leverage in terms of its control over the processing of rare earth elements. In addition, both states are undergoing targeted decoupling, notably in sectoral domains such as application-specific semiconductor technology through export restrictions. The ramifications associated with decoupling are profound because the technological bifurcation could lead to strategic vulnerabilities and compel nations to navigate value chain dependencies under heightened pressures.

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[95] Taneja, Hemant, and Fareed Zakaria. "AI and the New Digital Cold War." *Harvard Business Review*, September 6, 2023, https://hbr.org/2023/09/ai-and-the-new-digital-cold-war/

[96] Jain, Ash, and Matthew Kroenig. "Toward a Democratic Technology Alliance: An Innovation Edge That Favors Freedom." *Atlantic Council*, June 13, 2022, https://www.atlanticcouncil.org/in-depth-research-reports/report/toward-a-democratic-technology-alliance-an-innovation-edge-that-favors-freedom/

[97] Woods, Dwayne. "The Silicon Sword Hanging Over China's Head." *Journal of Chinese Political Science*, March 5, 2024, https://doi.org/10.1007/s11366-024-09883-5

[98] Moseley, Lauren. "Promoting Semiconductor 'Friend-Shoring': The Role of Indo-Pacific Allies and Partners in Supply Chain Resilience," *Center for Strategic and International Studies*, April 20, 2023, https://www.csis.org/programs/asia-program/promoting-semiconductor-friend-shoring-role-indo-pacific-allies-and-partners

Pakistan and the Afghan Taliban after 2021: A "Security Dilemma"?

M. Sheharyar Khan and Tasawar Hussain*

Abstract

Since the Afghan Taliban's return to power in 2021, relations between Pakistan and Afghanistan's Taliban-led government have deteriorated despite earlier expectations of improved cooperation. Islamabad anticipated that a friendly regime in Kabul would help curb cross-border militancy and contribute to regional stability. Instead, persistent security challenges and militant violence have deepened mistrust. Pakistan's border management and counterterrorism measures are perceived by the Taliban as coercive, while the Taliban's continued support of the Tehrik-e-Taliban Pakistan (TTP) is viewed in Islamabad as a direct security threat. Beyond ideological affinity, the TTP also holds instrumental value for the Taliban in terms of internal cohesion and leverage, complicating efforts to address Pakistan's concerns. Based on the above premise, this paper examines the evolving Pakistan–Taliban relationship between 2021 and 2025, and argues that the relationship is marked by a security dilemma between a sovereign state and a quasi-state authority. The paper further highlights how misperception, limited trust, and divergent understandings of security sustain this dynamic. The paper concludes by discussing policy-relevant implications for Pakistan and regional stability.

Keywords: Afghanistan, Pakistan, Taliban, TTP, Security Dilemma, Strategic Depth, Border Security, Ideological Legitimacy

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Introduction

The relationship between Pakistan and the Taliban regime in Kabul has seen a downward spiral in recent months. For decades, Islamabad's Afghan policy was predicated on the notion of a friendly government on Pakistan's western flank.[1] This approach indeed had a strategic logic. Since Pakistan had a tense border to the east with India, it did not expect the western border with Afghanistan to pose any significant security challenge. The Taliban's takeover of Kabul in 2021 sparked this hope for a friendly government. However, the Taliban's return to power challenged this expectation, which had earlier been viewed as a favorable outcome for Pakistan's Afghanistan policy. In the aftermath of the takeover, cross-border incidents and militant violence became more frequent, gradually undermining trust between the two sides.[2]

In October 2025, Pak-Afghan relations further deteriorated when Afghanistan falsely accused Pakistan of conducting air strikes against its territory.[3] Moreover, the exchange of ground fire between the forces on both sides left significantly escalated tensions.[4] Islamabad highlighted the Taliban regime's harbouring of militant groups, principally the TTP, and demanded that Kabul rein them in as a condition of peace.[5] Kabul, in turn, rejected the Durand Line's legitimacy, resisted Pakistani border-fortification efforts, and framed alleged Pakistan strikes as infringements on Afghan sovereignty.[6] On 19 October 2025, both sides agreed to an immediate ceasefire, mediated by Qatar and Türkiye, yet the underlying structural fault lines remain unresolved.[7] Against this backdrop, the central

[1] Aidan Parkes, "Considered Chaos: Revisiting Pakistan's 'Strategic Depth' in Afghanistan," *Strategic Analysis* 43, no. 4 (2019): 297–309, https://doi.org/10.1080/09700161.2019.1625512
[2] Bakhtawar Mian, "PM Blames Kabul-Delhi Nexus for Surge in Terrorist Attacks" *Dawn*, November 13, 2025, https://www.dawn.com/news/1954723
[3] Islamuddin Sajid, "Pakistan denies carrying out airstrikes in eastern Afghanistan which killed 10," Anadolu Ajansi, 25 November 2025, https://www.aa.com.tr/en/asia-pacific/pakistan-denies-carrying-out-airstrikes-in-eastern-afghanistan-which-killed-10/3753145
[4] "Border Clashes Erupt between Pakistan and Afghanistan—Again," *The Economist*, October 16, 2025, https://www.economist.com/asia/2025/10/16/border-clashes-erupt-between-pakistan-and-afghanistan-again
[5] Ministry of Foreign Affairs, Government of Pakistan, "Operation Against Terrorist Sanctuaries of TTP," press release, March 18, 2024, https://mofa.gov.pk/press-releases/operation-against-terrorist-sanctuaries-of-ttp
[6] Mammad Ismayılov, "Pakistan-Afghanistan Conflict: Self-Defense or Sovereignty Violation?" *Daily Sabah*, November 7, 2025, https://www.dailysabah.com/opinion/op-ed/pakistan-afghanistan-conflict-self-defense-or-sovereignty-violation
[7] "Pakistan and Afghanistan Agree to Maintain Truce for Another Week," *Al Jazeera*, October 30, 2025, https://www.aljazeera.com/news/2025/10/30/pakistan-and-afghanistan-agree-to-maintain-truce-for-another-week-turkiye

question guiding this paper is why relations between Pakistan and the Taliban have deteriorated despite a history of interaction and limited cooperation.

This paper surveys the relevant literature, develops the theoretical framework of the security dilemma in an asymmetric, ideologically-inflected context. Then it provides the empirical analysis first tracing the historical background, then examining the phases 2021–2023 and 2023–2025, emphasising the TTP dimension, and discussing the implications of the findings for theory and policy. The methodological orientation of the paper is process tracing, with supplementary comparative historical analysis. The study reconstructs the causal sequence leading to the present asymmetrical security dilemma between Pakistan and the Afghan Taliban, focusing on the TTP sanctuary problem and the evolution of bilateral interactions after 2021. The paper draws on official statements of Pakistan's and Afghanistan's leaders, secondary source-led academic literature, and reputable media sources. The combination ensures triangulation between state positions, scholarly interpretation, and real-time reporting about facts on the ground.

Pakistan's Afghan Policy

Scholarship on Pakistan's Afghan policy has long emphasized Islamabad's quest for a stable and friendly Kabul as a guarantor of its western flank. Ahmed Rashid argues that Pakistan's backing of the first Taliban regime in the 1990s was motivated by both ideological affinity and geostrategic necessity in the context of its security concerns and regional rivalries.[8] Similarly, Christine Fair notes that, while regional dynamics, including the presence of other external actors, played a role, Pakistan consistently sought cooperative relations with Afghanistan to ensure a stable and sovereign neighbour whose territory did not pose a threat to Pakistani borders and whose markets could facilitate expanded trade, including access to Central Asia.[9] Following the US withdrawal in 2021, many analysts assumed that Pakistan's decades-old relationship with the Taliban would translate into privileged influence in Kabul.[10] Yet, more recent studies suggest that the

[8]Ahmed Rashid, *Taliban: Militant Islam, Oil and Fundamentalism in Central Asia*, rev. ed. (New Haven: Yale University Press, 2022), 183–187, 32.
[9] C. Christine Fair, *Pakistan's Internal Security Environment*, NBR Special Report no. 55 (Seattle and Washington, DC: National Bureau of Asian Research, 2016).
[10] Husain Haqqani and M. K. Bhadrakumar, "Pakistan's Pyrrhic Victory in Afghanistan," *Foreign Policy*, July 22, 2021, https://www.foreignpolicy.com/2021/07/22/pakistans-pyrrhic-victory-afghanistan/

Taliban government exhibits greater autonomy than expected, undercutting Pakistan's leverage. The assumption of Islamabad's unmediated control over Taliban policy is thus increasingly challenged.[11]

The main bone of contention is the TTP, which had emerged within Pakistan as a domestic insurgent movement after 2007, inadequately restrained by previous peace deals. Although formally separate, the TTP pledged allegiance (*bay'ah*) to the Taliban's Emir, thereby erasing clear boundaries between the two entities in Afghanistan.[12] The sheltering of the TTP in Afghan territory has produced a recurrent security concern for Pakistan, which affects Pakistan's continuous efforts in counter-terrorism in the country. Pakistan has witnessed an uptick in terror attacks on its soil by the TTP ever since the Taliban took over in Afghanistan.[13]

Theoretical Framework

The concept of the security dilemma originates in classical realist thought, which holds that in an anarchic international system, states pursuing security through military or structural means may inadvertently threaten others, thereby provoking countermeasures and escalation. Robert Jervis famously observed that "in a condition of anarchy, efforts to increase one's security can decrease the security of others." [14] Ken Booth and Nicholas Wheeler further refine this insight by emphasizing how fear, uncertainty, and the absence of trust transform defensive actions into perceived offensive threats, producing what they describe as a *dilemma of interpretation*. [15]

Much of the existing literature on the security dilemma, however, assumes interactions between formally recognized states operating under shared expectations of sovereignty and diplomatic reciprocity, even when asymmetries of power exist. The Pakistan–Taliban relationship does not fit neatly within this conventional template. Pakistan functions as a sovereign

[11] Abdul Rehman and Mingjin Wang, "Pakistan and the Taliban: A Strategic Asset Turned Strategic Predicament," *Asia Policy* 19, no. 3 (2024): 153–171.
[12] Thomas Joscelyn, "Pakistani Taliban's Emir Renews Allegiance to Afghan Taliban," *Long War Journal*, August 19, 2021, https://www.longwarjournal.org/archives/2021/08/pakistani-talibans-emir-renews-allegiance-to-afghan-taliban.php
[13] Iftikhar A. Khan, "Terror Attacks Increased in Pakistan after Taliban Takeover of Afghanistan," *Dawn*, June 1, 2023, https://www.dawn.com/news/1757192
[14]Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics* 30, no. 2 (January 1978): 169.
[15] Ken Booth and Nicholas J. Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics* (Basingstoke: Palgrave Macmillan, 2008), 54.

state with consolidated institutions and internationally recognized borders, whereas the Taliban's Islamic Emirate governs Afghanistan as a de facto regime with limited international recognition, a lack of administrative capacity, and a legitimacy base that extends beyond conventional statehood. This distinction does not render the Taliban a non-state actor in the traditional sense; rather, it positions the regime as a governing entity that exercises territorial control while deriving authority from religious credentials, resistance narratives, and internal movement cohesion.

These differences significantly shape how security-related actions are interpreted on both sides. Classical security dilemma theory presumes a degree of parity in how actors signal intentions and interpret threats. In the Pakistan–Taliban dyad, however, differences in institutional structure, legitimacy sources, and governance norms complicate intention signaling and weaken the explanatory power of state-centric deterrence models. As a result, traditional security dilemma literature alone cannot fully account for the dynamics at play between the two states.

The Taliban's authority is not derived solely from territorial control or administrative capacity but is also grounded in their self-identification as a movement rooted in jihad, religious legitimacy, and the moral leadership of the Emir. While this ideological foundation does not uniformly dictate Taliban behavior, nor does it preclude pragmatic political decision-making, it remains an important lens through which the movement interprets external pressure, particularly demands related to fellow militant groups such as the Tehrik-e-Taliban Pakistan.

The TTP's allegiance to the Emir of the Taliban introduces a layer of religious and organizational obligation that complicates Taliban's decision-making. Acting decisively against the TTP carries potential costs for the Taliban, including reputational damage among militant constituencies and the risk of internal fragmentation. These constraints are reinforced by relational and cultural factors. The TTP supported the Afghan Taliban during their insurgency against the former Afghan government and its international backers; as a result, TTP militants are often regarded not merely as guests, whose protection is valorized under Pashtunwali, but as former comrades. This history shapes Taliban perceptions of obligation and restraint, even after assuming state power.

Importantly, however, the Taliban's tolerance and support of the TTP cannot be explained solely through ideological affinity or customary obligation. Available scholarship and policy analyses suggest that the TTP

also holds instrumental value for the Taliban regime. Beyond shared beliefs, the TTP's presence inside Afghanistan provides the Taliban with a degree of strategic leverage. Internally, continued association with the TTP reinforces the Emir's standing among militant networks and helps deter fragmentation within the broader jihadist landscape. Externally, the group functions as a pressure point in relations with Pakistan, enabling the Taliban to resist its perceived coercion and preserve autonomy without overtly escalating to direct interstate confrontation.

This instrumental dimension does not imply the existence of a formally articulated Taliban strategy of proxy warfare, nor does it suggest consensus across the movement. Rather, it reflects a pragmatic calculus in which the costs of fully dismantling the TTP, loss of militant support, erosion of ideological credibility, and diminished bargaining leverage, are weighed against the risks of continued tolerance. In this sense, the TTP occupies an ambiguous position: simultaneously an ideological affiliate, a former wartime ally, and a strategically useful yet destabilizing presence.

Pakistan and the Taliban thus interpret security issues through divergent strategic and normative frameworks, contributing to recurring tensions. From Islamabad's perspective, measures such as border fencing, cross-border strikes, and border closures are framed as defensive counterterrorism actions aimed at protecting territorial integrity and preventing militant infiltration. Official Pakistani discourse treats the persistence of cross-border militancy as a material security threat and views Taliban inaction and support for TTP primarily as a governance failure rather than an unavoidable product of ideology or misperception.

For the Taliban, however, these same actions are frequently interpreted as coercive, which erodes the sovereignty of Afghanistan. Taliban statements and post-2021 scholarship indicate that political behavior within the movement is shaped by a combination of religious legitimacy, jihadist identity, and local norms such as Pashtunwali, which emphasize honor, hospitality, and autonomy. These normative frameworks condition Taliban responses to external pressure, particularly when demands involve acting against allied militant groups.

Similarly, Pakistan's calls for decisive action against the TTP are articulated in Islamabad as legitimate counterterrorism requirements. Yet existing research suggests that the Taliban may perceive such demands as potentially

destabilizing for regime cohesion and internal authority. [16] While ideology and custom do not mechanically determine Taliban choices, they influence how the movement evaluates risks.

The presence of ideological legitimacy constraints and the informal strategic utility of the TTP complicate intention signaling, transforming misperception into sustained insecurity. This dynamic aligns more closely with Booth and Wheeler's dilemma of interpretation than with a pure Herz–Jervis model, while remaining firmly situated within the broader security dilemma tradition.

Differences also persist over trade and border management. Pakistan has increasingly employed transit routes and border crossings as instruments of pressure in its dealings with Kabul, whereas the Taliban view unimpeded access as a legitimate entitlement of a landlocked state. These competing interpretations generate recurring friction and episodic disruptions to bilateral trade and movement.

In essence, both actors operate according to defensive logics that are interpreted by the other as offensive. Pakistan emphasizes counterterrorism and border security to prevent militant spillover, while the Taliban prioritize sovereignty, regime stability, and religious legitimacy. The interaction of these logics—intensified by the Taliban–TTP relationship—perpetuates an asymmetric security dilemma in which measures intended to enhance security instead reinforce mutual suspicion.

Historical Context: From Strategic Depth to Strategic Dilemma

Pakistan's relationship with the Taliban has evolved significantly over time. In the 1990s, Islamabad backed the first Taliban regime as an ally to end the civil war in Afghanistan and have them in power as their friendly government. Islamabad also wanted to offset any influence of India. Pakistan has always viewed India's influence in Afghanistan through a strategic lens and believes that India would try to pose a threat through its western border.[17] After 2001, Pakistan became central to the Taliban's

[16] International Crisis Group, "Pakistan's TTP Problem and the Limits of Taliban Mediation," Crisis Group Asia Briefing no. 174 (December 2023).
[17] Noor Rehman, "Pakistan's Strategic Depth Policy in Afghanistan: Origin, Evolution and Practical Manifestations," *Research Journal of Human and Social Aspects* 2, no. 1 (2024): 1–17.

insurgency, allegedly offering safe havens and logistical support.[18] Under these conditions, the concept of strategic depth seemed viable.

However, after the Taliban's return to power in August 2021, Islamabad's expectations of cooperation were abruptly challenged. The Taliban emerged as a sovereign actor rather than a client. The change of behavior led to the erosion of Pakistan's leverage. There were hopes that Pakistan's two-decade-long terrorism problem would soon be addressed. But instead, cross-border militancy surged, and Afghanistan became less of a strategic asset than a potential liability.

Hence, what began as strategic depth has morphed into a strategic dilemma: Pakistan remains vulnerable to threats emanating from Afghan soil, while the Taliban resist Pakistani intervention in Afghanistan to stamp out TTP's hideouts, even when such actions are framed as counter-terrorism.

Phase I (2021–2023): The Onset of Mutual Insecurity

In the immediate aftermath of the Taliban takeover, two dynamics emerged simultaneously: Pakistan continued border fortification and intensified demands for Taliban action against the TTP, while the Taliban clung to the controversial principle of not recognizing the Durand Line as an international border[19] and refused to take concrete action against TTP elements.

From Islamabad's perspective, repeated militant activity originating from Afghanistan's eastern provinces, particularly Kunar, Khost, and Nangarhar has been interpreted as evidence of cross-border sanctuaries for anti-Pakistan groups.[20] Historically, Pakistani authorities have raised concerns regarding the presence of armed groups in Afghan territory that conduct operations inside Pakistan.[21] Between 2021 and 2024, documented incidents of terrorist attacks attributed to TTP and affiliated factions in Pakistan increased, with major attacks reported in Khyber Pakhtunkhwa, Balochistan, and northern Punjab.[22] Islamabad consistently called on the Taliban-led administration in Kabul to prevent the use of Afghan territory for anti-Pakistan operations, emphasizing the need for actionable measures

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[18] Barnett Rubin, "Afghanistan in 2025: Regional Prospects," *Foreign Affairs*, September 2025.
[19] Rehman and Wang, "Pakistan and the Taliban," 153–171.
[20] Pak Institute for Peace Studies, *Pakistan's Evolving Militant Landscape: State Responses and Policy Options* (Islamabad: PIPS, 2024).
[21] Waseem Abbasi, "Pakistan Warns of Strikes 'Deep into Afghanistan' If Cross-Border Attacks Continue," *Arab News*, October 29, 2025, https://www.arabnews.com/node/2620698/pakistan
[22] Iftikhar A. Khan, "Terror Attacks Increased in Pakistan after Taliban Takeover of Afghanistan."

to restrict militant movement.[23] Despite diplomatic engagements, Pakistani security assessments indicate that cross-border attacks persisted, contributing to heightened bilateral tension.

Phase II (2023–2025): The Escalation and the October 2025 Ceasefire

Pakistan and the Taliban have increasingly disagreed over border security. Pakistan moved ahead with major border-fencing efforts along the Durand Line, which Kabul has repeatedly condemned as a unilateral attempt to fix a colonial-era border that the Taliban have historically disputed.[24]

Tensions escalated further in late 2024, when Pakistan reportedly conducted air strikes in eastern Afghanistan's Paktika Province, targeting alleged militant hideouts; an action neither denied nor accepted by Pakistan and condemned by the Taliban as a violation of Afghan sovereignty.[25] Taliban alleged that the strikes reportedly killed dozens, including civilians.[26] From Islamabad's vantage point, these operations were legitimate exercises of self-defence under the hot-pursuit doctrine. From the Taliban's vantage, they were acts of violation of its sovereignty by an erstwhile ally that had not turned into an adversary. The result has been renewed border hostilities and mutual distrust. Pakistani officials have publicly attributed a spate of militant attacks on Pakistani territory to militants allegedly based in Afghanistan.

In 2024, diplomatic efforts ground to a halt. Pakistani delegations led by intelligence and foreign office officials pressed the Taliban to provide verifiable action against the TTP cadres and sanctuaries. Taliban proposed a tribal-mediated dialogue rather than coercive disarmament; Islamabad rejected this as inadequate, insisting instead on disarmament and repatriation of the TTP. The Organisation of Islamic Cooperation (OIC) and Qatar attempted to mediate during the summer but achieved nothing.[27]

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[23] Waseem Abbasi, "Pakistan Warns of Strikes 'Deep into Afghanistan' If Cross-Border Attacks Continue."

[24] "Pak-Afghan Border Fencing Issue to Be Resolved Diplomatically, Says Qureshi," *Dawn*, February 25, 2022, https://www.dawn.com/news/1667422/pak-afghan-border-fencing-issue-to-be-resolved-diplomatically-says-qureshi

[25]"Pakistan Air Strikes in Afghanistan Spark Taliban Warning of Retaliation," *Al Jazeera*, December 25, 2024, https://www.aljazeera.com/news/2024/12/25/pakistan-air-strikes-in-afghanistan-spark-taliban-warning-of-retaliation

[26] *The Express Tribune*, "46 Dead in Pakistan's Airstrikes on Afghan Border, Taliban Reports," December 26, 2024, https://tribune.com.pk/story/2518181/46-dead-in-pakistans-airstrikes-on-afghan-border-taliban-reports

[27] Asma Akbar, "Taliban 2.0: Implications for National Security of Pakistan," *Journal of Development & Social Sciences* 5, no. 4 (2024): 540–553.

Meanwhile, TTP-claimed suicide attacks in Dera Ismail Khan and Bannu heightened Pakistani analysts' fears of a "reverse strategic depth"; the notion that Afghanistan had become a sanctuary enabling anti-Pakistan insurgents. Afghan officials, on their own part, accused Pakistan of exaggerating TTP threats emanating from Afghanistan. They pointed out to lack of action on the Pakistani side of the border to rein in TTP. Taliban believe that Pakistan is using TTP as a ruse to justify military pressure and to manipulate trade flows to control Kabul's economy and regain its leverage.[28] While in the past, it was widely believed that the Taliban relied on some kind of Pakistan's support, which could give Islamabad some leverage with the Taliban, but the new regime has diversified its relations. It now has political and economic linkages with Qatar, China, Russia, and even India. This could mean that the Taliban can now act more independently.

In another development, Pakistan intensified efforts to evict Afghan refugees, a campaign that the Taliban government in Kabul views as political leverage deployed by Islamabad. For decades, Pakistan hosted millions of Afghans fleeing conflict, but since 2023, Islamabad has increasingly treated their presence through a security-oriented lens, linking refugees to terrorism. The Taliban argue this repatriation push is less about the security situation in Pakistan than pressure: in their view, Pakistan uses the refugee population as pawns in its wider strategic contest with Afghanistan.[29]

From late 2024 into 2025, the conflict became deadlier and attacks surged. Between September and October 2025, after a string of TTP attacks that killed more than thirty Pakistani security personnel, Islamabad reportedly launched the most extensive cross-border strikes since 2021. However, the government did not acknowledge the strikes. These strikes reportedly targeted TTP encampments in Kabul, Kunar, and Paktika provinces; in retaliation, Afghan border troops fired heavy artillery across the Durand Line, hitting Pakistani positions at 21 locations along the whole length of the international border. Dozens were reported killed on both sides.[30]

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[28] Bantirani Patro, "An Assessment of the Tehrik-i-Taliban Pakistan in 2023," *Defence & Diplomacy* 13, no. 2 (2024): 49–59.

[29] "Taliban Condemns Pakistan's Mass Expulsion of Afghan Refugees," *Al Jazeera*, November 1, 2023, https://www.aljazeera.com/news/2023/11/1/taliban-condemns-pakistans-mass-expulsion-of-afghan-refugees

[30] Saeed Shah, Mohammad Yunus Yawar, and Mushtaq Ali, "Dozens Killed in Pakistan-Afghanistan Clashes, Border Closed," *Reuters*, October 12, 2025,

Civilian casualties and the closure of trade routes produced a severe humanitarian crisis in Afghanistan.

The spectre of open war loomed large. Hundreds of cross-border incidents made the border indistinguishable from active conflict zones. International concern mounted. For example, Qatar and Türkiye convened emergency talks in Doha. Pakistan demanded that the Taliban regime clamp down on TTP with actionable and verifiable clauses in writing, which the Taliban could not provide. Negotiations nearly collapsed twice before both sides accepted a cease-fire brokered by Qatar and Türkiye on 19 October 2025.[31]

The terms of the cease-fire were significant, though flawed. The agreement established a "joint security coordination mechanism" of liaison officers from both countries, initially supervised by Qatar. It required cessation of air and artillery strikes, reopening of trade crossings, and detainee exchange. Crucially, however, it did not include any verifiable Taliban commitment to dismantle TTP bases. Effectively, Pakistan gained a ceasefire but not a lasting resolution of the underlying issue. Sporadic firing continued along the frontier into late October, and the Pakistani defence minister said that Pakistan would strike deep into Afghanistan if the intrusion continued.[32]

Regionally, stakeholders sought to contain the conflict. China urged restraint,[33] as it was mindful of its Belt and Road Initiative (BRI) corridor through Pakistan. Iran issued cautious statements emphasising Islamic brotherhood and opposition to foreign interference.[34] The US, though officially disengaged, expressed concern over terrorism risks emanating from Afghan soil.[35] Russia and Central Asian analysts warned of spill-over

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https://www.reuters.com/world/asia-pacific/afghanistan-claims-58-pakistani-soldiers-killed-clashes-border-closed-2025-10-12/

[31] Abby Rogers, "Pakistan and Afghanistan Agree to Maintain Truce for Another Week: Turkiye," *Al Jazeera*, October 30, 2025, https://www.aljazeera.com/news/2025/10/30/pakistan-and-afghanistan-agree-to-maintain-truce-for-another-week-turkiye

[32] Waseem Abbasi, "Pakistan Warns of Strikes 'Deep into Afghanistan' If Cross-Border Attacks Continue," *Arab News*, October 29, 2025, https://www.arabnews.pk/node/2620698/pakistan

[33] Syed Raza Shaikh and Ryan Woo, "China Urges Restraint as Pakistan-Afghanistan Border Clashes Escalate," *Reuters*, October 18, 2025, https://www.reuters.com/world/asia-pacific/china-urges-restraint-pakistan-afghanistan-border-clashes-escalate-2025-10-18/

[34] "Iran Calls for Dialogue between Pakistan, Afghanistan," *Islamic Republic News Agency (IRNA)*, October 17, 2025, https://www.irna.ir/news/8512345678/Iran-Calls-for-Dialogue-between-Pakistan-Afghanistan

[35] U.S. Department of State, "Department Press Briefing – October 16, 2025," October 16, 2025, https://www.state.gov/briefings/department-press-briefing-october-16-2025/

effects from militant networks.[36] From a theoretical perspective, external actors functioned as stabilisers as they tried to contain the situation from escalation. Trust between the two further deteriorated as both were once considered friendly, but were now talking through mediators.

The TTP as a Structural Constant

The persistence of the TTP is not merely a product of Taliban intransigence; it reflects the structural entanglement between the two movements. The TTP functions simultaneously as an ideological offshoot, a security liability, and a bargaining chip. For the Taliban, the group's presence grants leverage over Pakistan, reminding Islamabad that Afghan stability cannot be isolated from the dynamics of militancy along the Durand Line.

Even if elements within the Taliban leadership were inclined to limit the activities of the TTP, their ability to enforce such decisions appears constrained by internal dynamics. Authority within the movement remains uneven, with local commanders, often embedded in cross-border tribal and social networks, retaining significant operational autonomy. Forceful action against the TTP, therefore, carries the risk of internal dissent and of creating space for rival militant actors, including the Islamic State–Khorasan Province (IS-KP). In this context, the Taliban have tended to adopt a posture of calibrated restraint, publicly acknowledging Pakistan's concerns while refraining from measures that would significantly alter conditions on the ground.

Pakistan's military and diplomatic responses, ranging from defensive strikes at the border to stop infiltration of TTP and border closures to refugee repatriation and formal protests, have produced a limited coercive effect not because of insufficient pressure, but because they are grounded in a state-centric deterrence. Rather than altering Taliban's behavior, such measures are often absorbed within a broader religious narrative that prioritizes internal cohesion and moral authority over external cost-imposition. As a result, actions intended to signal resolve tend to reinforce Taliban resistance rather than induce compliance, revealing a structural mismatch between Pakistan's deterrence assumptions and the Taliban's decision-making framework.

[36] Alexander Gabuev and Temur Umarov, "The Domino Effect: How Pakistan-Afghanistan Clashes Threaten the Entire Region," Carnegie Endowment for International Peace, October 19, 2025, https://carnegieendowment.org/russia-eurasia/posts/2025/10/the-domino-effect-pakistan-afghanistan-clashes

Policy Implications for Pakistan and Regional Security

The immediate challenge for Pakistan lies in recalibrating expectations from Afghanistan. It warrants pragmatic engagement. The following policy directions could be:

- Pakistan should move beyond residual assumptions that stability in Afghanistan can be secured through political alignment or informal understandings, and instead prioritize a policy of strategic denial, defined as systematically preventing Afghan territory from being used by anti-Pakistan militant groups. This approach emphasizes strengthening domestic border governance, enhancing legal and administrative control over cross-border movement, and investing in technological surveillance and intelligence capabilities. By reducing reliance on expectations of voluntary cooperation from the Taliban, strategic denial seeks to institutionalize security outcomes and minimize vulnerability to fluctuating political or ideological commitments across the border.
- Despite mistrust, Islamabad should pursue functional cooperation on trade, transit, and counter-narcotics. Issue-specific collaboration builds interdependence that may moderate Taliban behavior over time. Regional mechanisms under the Shanghai Cooperation Organization (SCO) or any other mechanism could be revived for this purpose.
- China, Türkiye, and Qatar have emerged as key mediators. Pakistan can leverage these relationships to create a multilateral buffer with Kabul. Beijing's interest in corridor security provides incentives for silent diplomacy.
- Ultimately, Pakistan's external security is inseparable from its internal stability. Socio-economic development in Khyber Pakhtunkhwa and Baluchistan, coupled with deradicalization programs, can undercut the TTP's recruitment base. Merely externalizing the problem to Afghan soil overlooks the drivers within Pakistan itself.
- The Pakistan–Taliban standoff has had implications beyond bilateral relations, reinforcing the broader instability of post–US Afghanistan and underscoring the limits of coercive diplomacy in ideologically charged conflicts. For regional actors, the episode illustrates how unresolved state–non-state security dilemmas can generate secondary insecurity even for those not directly involved. Rather than introducing new alignments, the persistence of Pakistan–Taliban tensions has contributed to an environment of uncertainty in which regional powers must recalibrate their engagement with Kabul.

- The deterioration of Pakistan's relations with the Taliban complicates an already fragile security environment by increasing pressure along its western frontier, thereby narrowing strategic bandwidth. India has sought to diplomatically re-engage with Kabul, a development Islamabad views through a security lens shaped by historical rivalry, even in the absence of overt military cooperation. China and Russia, meanwhile, approach Afghanistan primarily through counterterrorism concerns, particularly the risk of militant spillover into Xinjiang and Central Asia. In each case, regional responses are shaped less by alliance formation than by shared anxieties over Afghanistan's role as a potential incubator of transnational militancy.

Taken together, these dynamics reinforce the central argument of this paper: that the Pakistan–Taliban relationship is best understood as an asymmetrical security dilemma amplified by ideological legitimacy and the presence of non-state actors. The absence of institutionalized mechanisms for signaling intent, combined with competing legitimacy frameworks, ensures that defensive measures are repeatedly misread, entrenching cycles of mistrust. For regional diplomacy, the key lesson is not the utility of coercion but the necessity of engaging hybrid political orders through parallel security and legitimacy-based frameworks. Without such an approach, both bilateral and regional efforts to stabilize Afghanistan will remain vulnerable to relapse.

Conclusion

The Pakistan–Taliban relationship since 2021 illustrates how the security dilemma evolves under conditions of sovereignty and ideological governance. What initially appeared as a convergence of interests has gradually transformed into a sustained pattern of tension, shaped less by immediate tactical disputes than by incompatible understandings of legitimacy, authority, and security. The Taliban's continued accommodation of the TTP reflects constraints rooted in religious allegiance and internal cohesion, while Pakistan's insistence on eliminating militant sanctuaries stems from the imperatives of state sovereignty and internal order. These competing logics have produced a relationship characterized by recurrent mistrust rather than stable cooperation.

This dynamic explains why periods of de-escalation have remained fragile. The October 2025 ceasefire reduced the risk of immediate confrontation but did not address the structural conditions that generate insecurity on both sides. Pakistan continues to interpret the Taliban's inaction against the TTP as a security threat, while the Taliban view Pakistan's defensive measures

through the lens of sovereignty and ideological autonomy. The persistence of these perceptions suggests that the core dilemma is not operational but conceptual: Pakistan operates within a nation-state framework centered on territorial control and institutional authority, whereas the Taliban's political outlook remains anchored in a transnational religious conception of legitimacy.

From a policy perspective, the findings suggest that durable stability is unlikely to emerge through coercion. Managing this relationship will require a gradual, layered approach that combines calibrated pressure with incentives aimed at encouraging more predictable patterns of behavior. At the same time, Pakistan's ability to navigate external security challenges will depend on strengthening domestic resilience through improved governance, counter-extremism measures, and socio-economic consolidation. Without addressing both the external ideological constraints and the internal sources of vulnerability, the Pakistan–Taliban relationship is likely to remain prone to periodic relapse rather than sustained stabilization.

Science Diplomacy: Unlocking Pakistan's Potential for Regional and Global Partnership

Safia Malik*

Abstract

Science diplomacy is increasingly recognized as an effective tool for addressing global non-traditional challenges, promoting international collaboration, and enhancing national capacities in various sectors. It involves leveraging international scientific collaboration to address global issues, enhance foreign relations, and foster scientific partnerships for national benefits. Pakistan has enormous potential to benefit from science diplomacy. The research paper examines Pakistan's existing science diplomacy-related initiatives at the bilateral and multilateral levels and also assesses key future areas of cooperation where science diplomacy can be utilized as a foreign policy tool to promote national development. By applying the theory of sustainable development, the study argues that Pakistan adheres to the United Nations' Sustainable Development Goals to promote shared economic prosperity. This qualitative study focuses on how Pakistan can leverage scientific cooperation to foster innovation and contribute to global science diplomacy initiatives. The findings of the study suggest that regional and global collaboration on joint research projects, technology sharing, and strategic investments in science diplomacy initiatives could strengthen Pakistan's image outwardly and growth inwardly.

Keywords: Science Diplomacy, Non-traditional Threats, Sustainable Development Goals, National Development, Global Partnerships, Shared Economic Growth

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Introduction

Science diplomacy has emerged as an important tool for promoting international cooperation and addressing non-traditional global challenges in an increasingly interconnected world. It involves international collaboration across diverse scientific fields to promote cooperative research and innovation, and socio-economic development among countries. Science diplomacy emphasizes that joint scientific efforts can help address global societal challenges while strengthening relations between states.[1] Following World War II, states made deliberate efforts to strengthen international cooperation in science and technology as a means to rebuild trust and support global peace, socio-economic growth, and development. As part of these efforts, two international institutions, such as the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the International Atomic Energy Agency (IAEA), emerged in 1945 in 1957,[2] respectively.

UNESCO promotes cross-border scientific research as a means to increase peace and stability. It has established networks such as the International Hydrological Programme (IHP)[3] and the International Geoscience and Geoparks Programme (IGGP), encouraging countries to share research, data, and technologies to address common issues such as water and environmental issues.[4] The IAEA's mandate focuses on the peaceful uses of nuclear technology. It provides training for capacity building in 180 countries to utilize nuclear technology for socio-economic development. Through its technical cooperation programme, the IAEA provides training, equipment, and funding to countries for peaceful nuclear applications in fields like energy, agriculture, water management, and the healthcare sector.[5] This program facilitates science diplomacy by building trust and promoting nuclear technology as a tool for development.

Apart from UNESCO and IAEA, the UN-led bodies actively advance science diplomacy across a broad spectrum of disciplines by fostering international scientific collaboration. The World Health Organization

[1] "What Is Science Diplomacy?" *The World Academy of Sciences (TWAS)*, December 11, 2023, https://twas.org/article/what-science-diplomacy
[2] "International Atomic Energy Agency, History." *International Atomic Energy Agency*, accessed December 24, 2025, https://www.iaea.org/about/overview/history
[3] "Intergovernmental Hydrological Programme." *UNESCO*, 2022, https://www.unesco.org/en/ihp
[4]"International Geoscience and Geoparks Programme." *UNESCO*, 2022.
[5] "Technical Cooperation Programme." *International Atomic Energy Agency*, https://www.iaea.org/services/technical-cooperation-programme

(WHO) plays an important role in coordinating global public health responses,[6] while the World Meteorological Organization (WMO) facilitates the systematic exchange of meteorological and climatological data essential for disaster risk management and climate policy formulation.

The World Intellectual Property Organization (WIPO), a specialized agency of the United Nations since 1974**,** plays a significant role in the framework of science diplomacy, as it provides the institutional platform for negotiating global rules on intellectual property rights that directly impact scientific research, technological innovation, and knowledge sharing.[7] By facilitating cooperation among its 193 member states, WIPO helps bridge gaps between developed and developing countries, enabling access to patents, technology transfer, and research collaboration. In this way, WIPO functions as a diplomatic platform where states reconcile national interests with global priorities, advancing both scientific progress and international cooperation.

The United Nations Environment Programme (UNEP) provides scientific assessments and policy guidance on global environmental issues.[8] The Intergovernmental Panel on Climate Change (IPCC), established by UNEP and the World Meteorological Organization (WMO), serves as a model of science diplomacy by synthesizing scientific evidence to facilitate climate negotiations under the UN Framework Convention on Climate Change (UNFCCC)**.**

The International Telecommunication Union (ITU) advances science diplomacy by enhancing global collaboration in digital technologies. Through initiatives like the "AI for Good" platform and the "Partner2Connect" coalition, ITU promotes sustainable development and bridges the digital divide. It also facilitates dialogue on key issues like AI, cybersecurity, and climate change, making it a vital player in promoting equitable access to Information and Communication Technologies (ICTs) and international cooperation.[9]

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[6] "How Science Diplomacy Can Make a Difference in Global Health." *Health Policy Watch*, March 11, 2023, https://healthpolicy-watch.news/how-science-diplomacy-can-make-a-difference-in-global-health/

[7] World Intellectual Property Organization (WIPO). "WIPO — A Brief History," https://www.wipo.int/about-wipo/en/history.html

[8] "Global Science Diplomacy for the Environment Program." *Global Council for Science and the Environment*, https://www.gcseglobal.org/GSD

[9] "ITU." *Diplo*, January 30, 2023, https://www.diplomacy.edu/itu/

Science Diplomacy

Science diplomacy has played a significant role in peacebuilding by bringing nations closer, including those with conflicting ideologies and priorities. For instance, the International Space Station (ISS) was established in 1998 as a collaborative effort among space agencies of the United States (US), Russia, Japan, Canada, and the European Union (EU) to build cooperation in space exploration and research.[10]

Science diplomacy has been essential in resolving and reducing conflicts by encouraging cooperation and trust among countries. The Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) project is a prominent example. SESAME is a particle accelerator and research facility located in Jordan. Scientists from politically unstable and conflict-ridden nations come together and collaborate on common scientific objectives, concentrating on fields like material science, environmental studies, and medical research, despite the geopolitical rivalries between their governments.[11]

While science diplomacy often facilitates international cooperation, it can also be a source of conflict when scientific and technological advances intersect with national security, economic interests, or geopolitical rivalries. The Cold War era exemplifies how missile development, like the arms race between the US and the Soviet Union, escalated global tensions and resulted in devastating consequences. More recently, concerns over the unethical use of emerging technologies like artificial intelligence have surfaced, exemplified by fears around autonomous weapons and mass surveillance programs. These examples illustrate how science diplomacy, while being a powerful tool for collaboration, can also exacerbate conflicts when scientific progress impacts security, national interest, and ethical governance.

The research paper explores the significance of science diplomacy in Pakistan and examines how scientific collaboration can contribute to national growth and international partnerships. Pakistan has taken several initiatives at bilateral and multilateral levels to pursue science diplomacy efforts, but its potential goes far beyond the existing initiatives. Pakistan can mitigate pressing non-traditional threats while enhancing its global scientific footprint. By analyzing successful case studies from other

[10] "International Space Station." *National Aeronautics and Space Administration (NASA)*, https://www.nasa.gov/international-space-station/

[11] Smith, Chris Llewellyn. "Synchrotron Light and the Middle East: Bringing the Scientific Communities Together through SESAME." *Science & Diplomacy*, https://www.sciencediplomacy.org/perspective/2012/synchrotron-light-and-middle-east

countries, the research identifies international best practices and strategies that Pakistan can adopt to enhance its science diplomacy efforts. The study concludes with recommendations for policymakers and stakeholders to foster a robust science diplomacy framework for Pakistan to build its image abroad and maximize socio-economic growth domestically.

Understanding Science Diplomacy

The conceptual evolution of science diplomacy can be traced to 17th-century scientific societies. These include the Royal Society of England, which was founded in 1660, and the Académie des Sciences of France, which was established in 1666. Both societies promoted the idea that science can be a neutral platform for dialogue, transcending political and cultural boundaries.[12] Moreover, the Cold War era (1947 to 1991) is considered one of the most important periods in science diplomacy. While competition between the US and USSR was intense in key areas such as space exploration and nuclear technologies, this rivalry also provided an opportunity for scientific cooperation. The launch of Sputnik satellites in 1957 by the USSR and the US moon landing in 1969 underscored how space exploration highlighted the strategic importance of science in projecting national power.[13]

During the same period, ideological divide among the two superpowers continued to exist, but they also began to realize that scientific collaboration could reduce tensions among them. In the 1960s, the US and USSR carried out scientific exchange programs in the health, environment, and space sectors.[14] The bilateral scientific exchange programs not only facilitated science but also sometimes served as a backchannel diplomacy during tense political periods.

In the post-Cold War era, the international community shifted its focus toward addressing global non-traditional challenges that required cooperation across national boundaries. International discourse on the peaceful uses of nuclear technology gained momentum through organizations such as the IAEA, as the global community gradually recognized the need for collective action on issues transcending national

[12]"History of the Royal Society." *The Royal Society*, https://royalsociety.org/about-us/who-we-are/history/

[13] Dinkel, Christopher. *Moon Rocks and Mediations: Cooperation and Competition in Space Race Diplomacy*. Master's thesis, Fort Hays State University, 2010, 166. https://doi.org/10.58809/UCZK1659 https://scholars.fhsu.edu/theses/166

[14] Dinkel, Christopher. "FHSU Scholars Repository." Fort Hays State University, 2010.

boundaries.[15] Owing to this momentum, various multilateral agreements were signed. On 12 June 1992, the UNFCCC was signed, placing environmental science at the heart of global governance.[16] Moreover, the Human Genome Project (1990-2003) illustrates how scientific collaboration emerged as a global priority in the post-Cold War period.[17] The project was a biological discovery led by an international group of researchers to study all of the DNA.

The term Science Diplomacy was first coined in 2003 by the then science and technology adviser to the US Secretary of the Department of State, Norman Neureiter. He defined science diplomacy as "[a]n intentional effort to engage with other countries where the relationship is not good otherwise."[18] In 2010, the American Association for the Advancement of Science (AAAS) organized the conference "New Frontiers of Science Diplomacy" in collaboration with the Royal Society and persuaded states to cooperate in the field of science diplomacy.[19] According to Director AAAS, Vaughan Turekian, "The use and application of science cooperation to help build bridges and enhance relationships between and amongst societies, with a particular interest in working in areas where there might not be other mechanisms for an engagement at an official level."[20] Nina Fedoroff, Science and Technology Adviser to the US Secretary of State from 2007-2010, stated that "Science diplomacy is the use of scientific collaborations among nations to address the common problems facing (twenty-first) century humanity and to build constructive international partnerships."[21] AAAS characterized science diplomacy into three categories:

Diplomacy for Science: This refers to diplomatic actions taken to facilitate international scientific collaboration by negotiating research and

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[15] Fischer, David. *International Atomic Energy Agency: The First Forty Years*. Vienna: International Atomic Energy Agency, 1997, 53–76, https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1032_web.pdf

[16] "What Is the United Nations Framework Convention on Climate Change?" *United Nations Climate Change*, 2022, https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change

[17] Zhu, Tian, and Tito Carvalho. "The Human Genome Project (1990–2003)." *Embryo Project Encyclopedia*, Arizona State University, May 6, 2014, https://embryo.asu.edu/pages/human-genome-project-1990-2003

[18]Ruffini, Pierre. "Conceptualizing Science Diplomacy in the Practitioner-Driven Literature: A Critical Review," *Humanities and Social Sciences Communications* 7, no. 1 (2020): 1–9, https://doi.org/10.1057/s41599-020-00609-5

[19] Ruffini, Pierre. "Conceptualizing Science Diplomacy."

[20] "Science as a Tool for International Diplomacy." *Europa (CORDIS)*, https://cordis.europa.eu/article/id/30532-science-as-a-tool-for-international-diplomacy

[21] Ruffini, "Conceptualizing Science Diplomacy."

development agreements and exchange programs or enabling the establishment of international research infrastructures. European Organization for Nuclear Research, also known as CERN, is the best example of diplomacy for science.

Science for Diplomacy: It uses science to advance diplomatic objectives. The Antarctic Treaty System best defines science for diplomacy. It is an international agreement that governs research and conservation in Antarctica and exemplifies how science can be a catalyst for peaceful cooperation in a unique and challenging environment.[22]

Science in Diplomacy: It promotes the direct support of diplomatic processes through science by providing scientific advice and evidence to inform and support decision-making in foreign and security policies. The IPCC, which was established in 1988, brings together the world's leading climate scientists to assess the latest research on climate change. IPCC's reports provide policymakers with the scientific basis for international agreements such as the Paris Agreement and demonstrate the way science can inform and guide diplomacy on important global issues.[23]

Correlating Sustainable Development and Science Diplomacy

Sustainable development is a concept that integrates economic growth, environmental protection, and social equity to ensure the well-being of both current and future generations. The idea has evolved through numerous theoretical frameworks, each offering unique insights into how sustainable development can be achieved. The theory emphasizes a balanced approach regarding the relationship of the environment, economy, and society, and emphasizes long-term strategies. It provides the basis for global initiatives such as the UN 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). The first definition that incorporated the concept of sustainable development was given in the "Brundtland Report," which was prepared by the Commission on Environment and Development (formally known as the Brundtland Commission) in 1987. The then-chair of the commission, Dr. Gro Harlem Brundtland, defined sustainable development as "development that meets

[22] "The Antarctic Treaty Explained", British Antarctic Survey," 2015, https://www.bas.ac.uk/about/antarctica/the-antarctic-treaty/the-antarctic-treaty-explained/.
[23] Intergovernmental Panel on Climate Change, "History", IPCC, 2019, https://www.ipcc.ch/about/history/.

the needs of the present without compromising the ability of future generations to meet their own needs."[24]

Sustainable development theory offers perspectives on how science diplomacy can pave the way for cooperation among nations. By aligning its diplomatic initiatives with the principles of sustainability, Pakistan can position itself as a proactive contributor to addressing transnational challenges such as climate change, renewable energy transitions, water security, and food sustainability. Pakistan can advance sustainable development practices within the science diplomacy framework, unlocking its potential to become a leading regional and global player in utilizing scientific innovation.

State of Science Diplomacy in Pakistan

Pakistan has also taken several initiatives to promote science diplomacy because of its significance. In 2022, Pakistan launched its National Science, Technology, and Innovation Policy to provide guidelines for the country's science diplomacy. It acknowledges science as an important enabler of socio-economic development and calls for intensified international cooperation in scientific research and innovation.[25] The policy provides clear objectives aimed at expanding the scientific and technological output of Pakistan while promoting cooperation with multilateral organizations in various scientific areas, including biotechnology, renewable energy, health security, and science diplomacy.[26]

Pakistan has pursued science diplomacy through both bilateral and multilateral channels. It has entered into cooperation agreements with technologically advanced countries and undertaken several notable bilateral initiatives aimed at strengthening scientific collaboration. In 2005, the United States Agency for International Development (USAID), in collaboration with Pakistan's Ministry of Science and Technology (MOST) and the Higher Education Commission (HEC), launched the Pakistan-US Science and Technology Cooperation Program. The objectives of this

[24] "1987: Brundtland Report," United Nations, March 20, 1987, https://www.are.admin.ch/are/en/home/media/publications/sustainable-development/brundtland-report.html

[25] Government of Pakistan, Ministry of Science and Technology, *"National Science, Technology and Innovation Policy",* (Islamabad, Pakistan Council for Science and Technology, January 2022), https://most.comsatshosting.com/Policies/NSTPolicy2022.pdf

[26] Government of Pakistan, *"National Science, Technology and Innovation Policy."*

program are: (i) to strengthen the community of science and technology in Pakistan for improving economic development; (ii) to raise the standard, applicability and capability of science and technology-related higher education and research at Pakistani institutions of higher learning; and (iii) to enhance the capability of Pakistan's research institutes to support competitiveness in the industry.[27]

Another initiative is the US-Pakistan Centers for Advanced Studies (USPCAS), which was established in partnership with Pakistani universities, focusing on energy, water, and agriculture to address Pakistan's specific developmental needs. The US Government, through USAID, and the Government of Pakistan through the HEC, partnered together to create state-of-the-art centers for advanced studies.[28] The five-year program, which spanned from 2014 to 2019, successfully established centers that remain operational to this date.[29] The USPCAS established: (i) Two Centers for Advance Studies in Energy at the National University of Science and Technology (NUST) Islamabad and the University of Engineering and Technology (UET) Peshawar, which focuses on clean energy technologies; (ii) Center for Advance Studies in agriculture at University of Agriculture Faisalabad, which focuses on crop improvement and biotechnology, water management and irrigation and agricultural economies and policy; and (iii) Center for Advance Studies in Water at Mehran University of Engineering and Technology, Jamshoro, which focuses on water resource management, sustainable water use and improved water quality.[30]

Pakistan and China are also engaged in science diplomacy. Beijing and Islamabad enjoy a long history of cooperation in joint space projects that date back to the 1970s. The first satellite indigenously made in Pakistan, Badar-1, was launched in 1992 from China.[31] The China-Pakistan Economic Corridor (CPEC) is the flagship project of the Belt and Road Initiative (BRI). To support CPEC, the China-Pakistan Joint Research Centre (CPJRC) was established to focus on scientific problems in earth

[27] U.S. Agency for International Development. "U.S.–Pakistan Science & Technology Cooperative Program: Archive," https://2012-2017.usaid.gov/news-information/fact-sheets/us-pakistan-science-technology-cooperative-program

[28] "About U.S.–Pakistan Center for Advanced Studies in Water." *USPCAS-W*, April 16, 2019, https://water.muet.edu.pk/about-us

[29] US–Pakistan Centers for Advanced Studies in Energy." *USPCAS-E*, https://uspcase.asu.edu/

[30] "About U.S.-Pakistan Center for Advanced Studies in Water," USPCAS-W, April 16, 2019, https://water.muet.edu.pk/about-us/.

[31] SVI Administrator, "Pakistan-China Space Cooperation" *Strategic Vision Institute*, February 28, 2021, https://thesvi.org/pakistan-china-space-cooperation/.

sciences.[32] It will become an international platform for the China-Pakistan scientific and technological cooperation with prominent experts from both countries. On November 28, 2022, the China-Pakistan Science and Technology Cooperation Centre was established in Beijing to boost science and technology collaboration. The center focuses on cooperation in the fields of AI, Internet of Things (IoT), big data, cloud computing, robotics, fintech, biotechnology, and blockchain.[33]

China and Pakistan have signed an agreement to facilitate the transfer of civil nuclear technology to Pakistan, including nuclear power reactors.[34] China is the only country cooperating with Pakistan in the nuclear energy sector.[35] The Karachi Nuclear Power Plant (K2) and K3, and the four nuclear power plants located at Chashma, reflect strong bilateral ties and technological exchanges between the two countries. Pakistan Atomic Energy Commission (PAEC) is responsible for the development and management of the civilian use of nuclear technology in Pakistan. The four Chashma nuclear power plants collectively generate 1,335 MWe. An agreement for Chashma 5 (C5) with 1,200 MWe capacity has been concluded with China. The addition of K2 and K3 with a capacity of 1100 MWe each, further proves Pakistan's continued progress in this field. These plants are cost-effective and are making nuclear energy one of the most affordable options compared to other energy sources. Under its Nuclear Energy Vision 2050, Pakistan plans to produce 42,000 MWe, which would account for one-fourth of the country's energy needs. In 2023-2024, nuclear energy contributed about 18 percent to Pakistan's energy mix.[36] The growth in the production of nuclear power will not only meet Pakistan's increasing energy demand but also help to mitigate the effects of climate change and facilitate socio-economic development.

Pakistan has also established university-based international projects, including the International Center for Chemical and Biological Sciences (ICCBS) located at the University of Karachi. The initial impetus came

[32] "Introduction: CPEC Data Sharing Platform for Resources, Environment, Ecology and Disaster," Cpjrc.net, http://www.cpjrc.net/page/introduction.
[33] Sana Jamal, "Pakistan, China Launch New Centre to Boost Tech Cooperation," *Gulf News,* 2 December 2022, https://gulfnews.com/world/asia/pakistan/pakistan-china-launch-new-centre-to-boost-tech-cooperation-1.92443426.
[34] Sher Ali Kakar, "Pak-China Nuclear Energy Cooperation," *The Nation,* January 11, 2025, https://www.nation.com.pk/11-Jan-2025/pak-china-nuclear-energy-cooperation.
[35] World Nuclear Association, "Nuclear Power in Pakistan," updated November 17, 2025, https://world-nuclear.org/Information-Library/Country-Profiles/Countries-O-S/Pakistan
[36] Government of Pakistan, Finance Division, *Energy,* Islamabad: Finance Division, 2024, https://www.finance.gov.pk/survey/chapter_24/14_energy.pdf

from academicians, but the initiative is supported and funded by the government of Pakistan. ICCBS is internationally recognized as a Center of Excellence by UNESCO, the Organization of Islamic Cooperation (OIC), and the World Academy of Sciences (TWAS). The ICCBS has developed extensive partnerships with institutions in more than 80 countries worldwide. These collaborations involve training young researchers at the graduate and postgraduate levels, establishing centres of excellence in multiple disciplines, jointly organizing capacity-building programs, and undertaking collaborative research projects.[37]

Another major initiative by Pakistan is the establishment of the National Aerospace Science and Technology Park (NASTP) in 2019.[38] It is located in Karachi and Islamabad. NASTP has emerged as a key hub for advancing national and international science and technology projects, playing an important role in growing innovation and collaboration in the aerospace and high-tech sectors. It is currently home to more than 60 companies ranging from entrepreneurial start-ups to multinational companies from Türkiye, China, the US, UAE, New Zealand and Switzerland working across eight distinct themes of the park that include: AgriTech, AutoTech, EduTech, EnergyTech, FinTech, HealthTech, SmartTech and DefTech.[39]

In 2018, the Foreign Ministry of Pakistan launched its Science Diplomacy Initiative (SDI) under the Science Diplomacy Division, which was established in 2016 to promote scientific cooperation between Pakistan and international stakeholders such as research institutes, international organizations, multi-national companies, and universities. SDI focuses on strengthening collaboration in targeted fields, including research and development, renewable energy, agriculture, health, and climate change, all of which align with the UN-led SDGs.[40] SDI has also built partnerships with international science and technology institutions and research organizations across multiple countries. Through joint research activities, workshops, and

[37] Chaudhary, Muhammad Iqbal, and Hina Siddiqui. "Science Diplomacy: Role of International Center for Chemical and Biological Sciences, University of Karachi, Pakistan—An Example of Sustainable Cooperation Across the Globe." *Science Diplomacy Perspectives* 1, no. 1 (2022): 101.
[38] National Aerospace Science & Technology Park. "National Aerospace Science & Technology Park (NASTP)," https://nastp.gov.pk/
[39] "IASP Global Directory of Science & Technology Park & Innovation District." *International Association of Science Parks and Areas of Innovation (IASP)*, https://www.iasp.ws/our-members/directory/@6166/national-science-and-technology-park--nstp-
[40] Ahmed, Monir Uddin, et al. "An Overview of Science Diplomacy in South Asia." *Science & Diplomacy*, February 17, 2021, https://www.sciencediplomacy.org/article/2021/overview-science-diplomacy-in-south-asia.

seminars, it promotes the exchange of scientific knowledge and technical expertise.

In the academic domain, the Ministry of Foreign Affairs, in collaboration with the OIC Standing Committee on Scientific and Technological Collaboration (COMSTECH), launched the first issue of its science diplomacy Journal titled *Science Diplomacy Perspectives* in March 2022.[41] The journal comprises in-depth scholarly contributions from career diplomats, subject-matter experts, and academics, encompassing a wide array of issues pertaining to science and technology.

At the international level, Pakistan has been engaged with international centers for scientific research. In 2014, Pakistan was the first Asian country that become an associate member of the CERN,[42] highlighting Pakistan's involvement in cutting-edge scientific research. Scientists from Pakistan participate in high-energy physics research and collaborate with leading scientists around the world. Pakistan has been a key partner of the International Centre for Theoretical Physics (ICTP). Various physicists, mathematicians, and computer scientists from Pakistan engage in ICTP programs, contributing to research in the fields of quantum mechanics, climate modeling, and computational science.[43]

Pakistan, being a founding member of the IAEA, supports peaceful nuclear research and development, with a focus on improving health, agriculture, and environmental sustainability. Pakistan has collaborated with the IAEA on cancer research and treatment, resulting in the development of nuclear medicine facilities that provide early diagnosis and treatment of cancer. Through IAEA's assistance, Pakistan has made significant advancements in crop improvement, pest control, and food preservation, using nuclear techniques to enhance food security.[44]

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[41] "Launch of the First Issue of 'Science Diplomacy Perspectives.'" *Ministry of Foreign Affairs, Pakistan*, March 15, 2022, https://mofa.gov.pk/press-releases/launch-of-the-first-issue-of-science-diplomacy-perspectives

[42] "Pakistan Becomes the First Associate CERN Member from Asia." *Ministry of Foreign Affairs, Pakistan*, 2014, https://mofa.gov.pk/pakistan-becomes-the-first-associate-cern-member-from-asia

[43] "Pakistan: ICTP." *International Centre for Theoretical Physics (ICTP)*, 2024, https://www.ictp.it/taxonomy/term/106

[44] Aftab, Ambassador, and Ahmad Khokher. "Pakistan and the IAEA: A Mutually Beneficial Partnership." *Special Guest Articles*, 2023, https://issi.org.pk/wp-content/uploads/2023/11/Article-Pakistan-and-the-IAEA-A-Mutually-Beneficial-Partnership-by-Ambassador-Aftab-Ahmad-Khokher.pdf

Science Diplomacy

Pakistan is committed to cooperating in space exploration with other nations. In 2022, the third international conference on space was held by the Space and Upper Atmosphere Research Commission (SUPARCO), Pakistan's space agency, and is an example of Pakistan's commitment to enhancing its space capabilities. Participants from South Korea, Australia, China, Türkiye, Azerbaijan, the UAE, Italy, Canada, and many others attended the conference.[45]

Pakistan is also leveraging science diplomacy at the regional level to address common challenges with neighboring countries. As a member of ECO, Pakistan has contributed to the establishment of the ECO Science Foundation, which promotes scientific collaboration among member states. The foundation focuses on capacity building in science and technology through cooperative research and knowledge-sharing. [46]

Although the SCO does not have a dedicated body exclusively for scientific and technological collaboration, it has launched several initiatives to foster cooperation in these fields, which include: (i) regular Meetings of Heads of Ministers and the Department of Science and Technology of the SCO Member States.[47] Pakistan actively participates in this regular meeting to seek collaboration in IT, biotechnology, energy, and health sciences; and (ii) the SCO University Network established in 2008 allows student exchange programs, joint degrees, and research collaboration in engineering, IT, and environmental sciences. In July 2025, the National University of Sciences and Technology (NUST) joined the SCO University Network for Digital Economy Education, partnering with leading regional universities to promote collaboration in AI, big data, and cross-border e-commerce.[48]

During the COVID-19 Pandemic, Pakistan's science diplomacy was evident in its efforts to secure vaccines and engage in international partnerships for health security. Pakistan's collaboration with China on

[45] Mumtaz, Muhammad. "International Conference on Space 2022." *COMSTECH*, December 31, 2021, https://comstech.org/international-conference-on-space-2022/
[46] "ECO Science Foundation Established." *Dawn*, December 21, 2011, https://www.dawn.com/news/682182/eco-science-foundation-established
[47] "Meeting of Heads of Ministries and Departments of Science and Technology of the SCO Member States." *Shanghai Cooperation Organisation*, June 21, 2024, https://eng.sectsco.org/20240621/1400265.html
[48] "Rector NUST at the Signing of the SCO University Alliance for Digital Economy Education." *National University of Sciences and Technology (NUST)*, 2017. Accessed September 2, 2025, https://nust.edu.pk/news/rector-nust-at-the-signing-of-the-sco-university-alliance-for-digital-economy-education/

vaccine development, including the co-production of the Sinopharm and Sinovac vaccines, demonstrated the country's ability to leverage diplomatic ties for critical scientific and health needs.[49] In 2021, Pakistan's Ministry of Foreign Affairs, through the SDI, hosted a coordination meeting to discuss international collaboration and partnerships in vaccine production. On the occasion, the then Foreign Secretary, Ambassador Sohail Mehmood, emphasized the importance of achieving self-reliance in vaccine production and strengthening national health security efforts through international partnerships and collaboration.[50] Pakistan has also joined global initiatives such as the Coalition for Epidemic Preparedness Innovations (CEPI) and participated in the COVAX facility, which seeks equitable vaccine access for all countries. This collaboration is an important aspect of Pakistan's science diplomacy aimed at enhancing global health security.

Pakistan's Potential as a Hub for Regional Cooperation in Science and Technology

Pakistan holds significant potential to serve as a hub for regional cooperation in science and technology, given its strategic geographic location bridging South Asia, Central Asia, and the Middle East. With a large pool of skilled scientists, expanding research institutions, and its role in multilateral forums, Pakistan can facilitate collaborative research, technology transfer, and innovation partnerships. Strengthening this role could not only advance national and regional development but also enhance Pakistan's position in global science diplomacy. The paper has identified five potential areas of cooperation, which are as follows:

Science Diplomacy in the Extraction of Mineral Resources

Pakistan is a resource-rich country. Mineral resources play a pivotal role in Pakistan's economic development, and through science diplomacy, Pakistan can capitalize on them for regional cooperation. The country possesses the world's second-largest salt mines, fifth-largest copper and gold reserves, and the second-largest coal deposits. Despite this vast potential, the mineral sector contributes only about 3 percent to Pakistan's GDP, and its exports

[49] Siddiqui, Adeel, et al. "An Overview of Procurement, Pricing, and Uptake of COVID-19 Vaccines in Pakistan." *Vaccine*, July 2021, https://doi.org/10.1016/j.vaccine.2021.07.072

[50] "Coordination Meeting on International Cooperation and Partnerships in Vaccine Production." *Ministry of Foreign Affairs, Pakistan*, 2021, https://mofa.gov.pk/coordination-meeting-on-international-cooperation-and-partnerships-in-vaccine-production

account for merely 0.1 percent of the global total.[51] Pakistan could partner with technologically advanced countries to conduct research in sustainable extraction of natural resources, environmental conservation, and mineral processing. Collaboration with countries like China, the US, Canada, Japan, and the EU could lead to technology transfer, enabling Pakistan to adopt greener mining practices.[52] On 30 July 2025, the US and Pakistan signed a trade deal that expands cooperation in energy, rare earth minerals, hydrocarbons, digital infrastructure, and joint exploration of Pakistan's oil reserves.[53] On 7 September 2025, Pakistan signed a Memorandum of Understanding (MoU) for the investment of $500 million with the US Strategic Metals (USSM) to explore critical mineral resources, including copper, gold, and rare earth minerals.[54] The deal will boost Pakistan's economic growth, attract advanced US technology and investment, improve foreign exchange earnings, strengthen industrial capacity, and elevate Pakistan's role in regional and global trade networks.

Exploring Untapped Blue Economy

The blue economy is another area of regional cooperation through science diplomacy. As a country with an extensive coastline, Pakistan holds significant potential to leverage its strategic geographic position for seaborne trade. Given the growing demand for sustainable development and effective resource management, Pakistan should transition toward a blue economy. The major sectors in Pakistan's blue economy are ports and infrastructure, fisheries, renewable energy production, shipping, and maritime tourism.[55] With around 1,049 km of coastline and ports, including Karachi Port Trust, Port Muhammad Bin Qasim, and Gwadar Port

[51] Akhtar, Syed, and Hussain Shah. *Strategy for Mineral Sector Development in Pakistan*. Islamabad: Planning Commission of Pakistan, Ministry of Planning, Development & Reform, Government of Pakistan, 2018, https://www.pc.gov.pk/uploads/pub/FIRST_05_PAGES_STRATEGY_FOR_MINERAL_SECTOR_DEVELOPMENT_IN_PAKISTAN.pdf

[52] Mehmood, Saima, et al. "The Role of Green Industrial Transformation in Mitigating Carbon Emissions: Exploring the Channels of Technological Innovation and Environmental Regulation." *Energy and Built Environment* 5, no. 3 (2024): 464–479, https://doi.org/10.1016/j.enbenv.2023.03.001

[53] Shahid, Ariba, et al. "Pakistan Says It Wins US Tariff Deal; Trump Cites Oil Reserves Pact." *Reuters*, July 31, 2025. https://www.reuters.com/world/asia-pacific/pakistan-says-it-wins-us-tariff-deal-trump-cites-oil-reserves-pact-2025-07-30/

[54] Momand, Abdullah, and Sanaullah Khan. "US Metals Company Signs $500m MoU with Pakistan on Critical Minerals." *Dawn*, September 8, 2025, https://www.dawn.com/news/1940515

[55] Wenhai, Lu, et al. "Successful Blue Economy Examples with an Emphasis on International Perspectives." *Frontiers in Marine Science*, vol. 6, 7 June 2019, www.frontiersin.org/articles/10.3389/fmars.2019.00261/full, https://doi.org/10.3389/fmars.2019.00261.

Authority, Pakistan is now strategically positioned to enhance its access to international trade and energy supply routes. With an Exclusive Economic Zone (EEZ) covering approximately 240,000 square km, along with an additional 50,000 square km of continental shelf, the country's maritime territory holds vast, largely unexplored deep-sea resources. Pakistan's blue economy currently contributes approximately USD 1 billion, or around 0.4 percent of the national GDP.[56] According to Pakistan's Ministry of Maritime Affairs, the blue economy's estimated potential exceeds USD 100 billion, underscoring substantial untapped opportunities for economic growth and development through the sustainable utilization of oceanic resources.[57]

Partnering with maritime technologically advanced countries, such as Norway, Japan, and Australia, Pakistan can develop expertise in marine sciences, including sustainable fisheries, marine biotechnology, and environmental monitoring. Science diplomacy can help Pakistan access international expertise in aquaculture, diversifying its fishing economy and contributing to food security. Countries like China and Thailand, which have expertise in aquaculture, could help promote sustainable practices and increase Pakistan's aquaculture scope. [58]

There are various international models available for cooperation in the blue economy that emphasize technology sharing to protect and develop ocean resources. The EU's Blue Growth Strategy promotes sustainable marine industries through research partnerships,[59] UNESCO's Ocean Decade unites countries to address pollution and marine biodiversity. Australia's Indo-Pacific Oceans Initiative (IPOI) strengthens regional maritime governance, and the US National Oceanic and Atmospheric Administration (NOAA) global partnerships on ocean science support capacity building worldwide. Additionally, Norway's High-Level Panel advocates sustainable ocean use through policy-driven collaboration, and the Indian Ocean Rim Association (IORA) fosters cooperative marine projects across

[56] Lu, Wenhai, et al. "Successful Blue Economy Examples with an Emphasis on International Perspectives." *Frontiers in Marine Science* 6 (June 7, 2019), https://doi.org/10.3389/fmars.2019.00261

[57] Dr Samar Iqbal Babr and Muhammad Danish Masood, "Pakistan's Quest for Sustainable Maritime Development", *Strategic Thought* 6 (1):125-38, http://111.68.99.125/st/site/article/view/121.

[58] Giri, Shiba S. "Sustainable Aquaculture Practices in South Asia: A Comparative Analysis of Feed Formulation and Utilization." *Animal Frontiers* 14, no. 4 (2024): 6–16, https://doi.org/10.1093/af/vfae020

[59] "Sustainable Blue Economy." *European Commission – Oceans and Fisheries*, https://oceans-and-fisheries.ec.europa.eu/ocean/blue-economy/sustainable-blue-economy_en

the region. For Pakistan, joining similar initiatives could enhance its blue economy by expanding research capabilities, improving resource management, and accessing advanced marine technology.

Science Diplomacy for Mitigating Climate Change

Pakistan's vulnerability to climate change necessitates proactive diplomatic engagement with global partners in climate resilience initiatives. Through international collaboration, Pakistan can strengthen the research capabilities in glaciology, hydrology, and agriculture areas that are vital for an agrarian economy highly exposed to climate variability.[60] Science diplomacy provides opportunities to foster partnerships with agricultural research organizations to develop climate-resilient crops and sustainable farming practices. At the same time, collaboration with countries experienced in disaster response and climate adaptation, such as Japan and China, can help Pakistan improve early warning systems, flood control mechanisms, and urban planning, thereby enhancing resilience against increasingly frequent climate-induced disasters.[61] Beyond agriculture and disaster preparedness, Pakistan can leverage science diplomacy to build partnerships in renewable energy, water management, and digital climate solutions.

Pakistan has been actively participating in the UNFCCC**,** IPCC, and UNEP, which allows Pakistan to advocate for climate justice, technology transfer, and capacity-building support. Joint research projects with advanced countries and regional organizations in green technologies, glacier monitoring, and climate-smart agriculture, along with bilateral and multilateral science agreements,[62] will provide Pakistan access to funding, expertise, and clean technologies. By promoting academic exchange, data-sharing, and participation in global climate innovation hubs, Pakistan can further strengthen evidence-based policymaking, enhance national adaptive capacity, and position itself as a constructive contributor to global climate action.

[60] Mehwish, Sabeen Azam, Akhlaque Hussain Larik, Zuberia Sadiq, Sadaf Jan Siddiqui, and Umaima Iqbal. "Pakistan's Approach to Climate Change Diplomacy: An Analysis of SDG 13." *Dialogue Social Science Review (DSSR)* 3, no. 4 (2025): 91–109, https://thedssr.com/index.php/2/article/view/458

[61] Mehwish, Azam, Hussain Larik, Sadiq, Siddiqui, and Iqbal. 2025. "Pakistan's Approach to Climate Change Diplomacy: An Analysis of SDG13."

[62] "Pakistan's Approach to Climate Change Diplomacy: An Analysis of SDG13."

Training and Capacity Building Workshops in the Peaceful Uses of Nuclear Energy

Pakistan is providing technical assistance in the peaceful utilization of nuclear technology to other countries. Pakistan's Center of Excellence and Nuclear Security (PCENS) aims to provide training in collaboration with the IAEA on nuclear security, intelligence, technical training, and counter-intelligence to security forces.[63] In March 2016, PCENS hosted the annual meeting of the Nuclear Security Support Center (NSSC) network. This marked the first occasion on which the IAEA convened an NSSC meeting outside its Vienna Headquarters, with 50 participants representing 33 countries in attendance.

Science Diplomacy for Vaccine Development

Just like any developing state, Pakistan faces challenges like infectious diseases, malnutrition, and non-communicable diseases. Science diplomacy can facilitate international collaboration on vaccine development, disease surveillance, and pandemic preparedness. For Pakistan, establishing its vaccine Development complex is not just a matter of health security but a strategic imperative to ensure timely access to life-saving vaccines.

Pakistan can develop its vaccine by collaborating with China, Brazil, Cuba, and Vietnam, which are producing and supplying the vaccine to other countries. China, one of the leading manufacturers of vaccines, has collaborated with Pakistan during the COVID-19 pandemic, providing vaccines and expertise. China can offer technology transfer, training, and investment in local vaccine manufacturing facilities. In July 2021, Cuba offered to establish a vaccine production center in Pakistan to cater to both domestic needs and potential export. The proposal was put forward by the Cuban Ambassador, Zener Javier Caro Gonzalez, during his meeting with Pakistan's Federal Minister for Science and Technology.[64]

Pakistan can engage with the Vaccine Manufacturers Network (DCVMN), which plays a key role in strengthening both the technical and operational capacities of vaccine producers. Similarly, Brazil signed an MoU with Gavi, the Vaccine Alliance, to collaborate on vaccine production,

[63] Rahat Iqbal, "Enabling Environment for Peaceful Uses of Nuclear Energy in Pakistan" *Stratheia,* July 11,2023, https://stratheia.com/enabling-environment-for-peaceful-uses-of-nuclear-energy-in-pakistan/.
[64] Muhammad Ishtiaq, "Cuba Offers to Establish Vaccine Production Center in Pakistan," *Arab News*, July 14, 2021, https://www.arabnews.pk/node/1893896/spa/aggregate.

innovation, and global access. The same MoU can be signed between Pakistan and Gavi.

In Basic manufacturing, Pakistan's National Institute of Health (NIH) can play an important role in building the vaccine development complex in Pakistan. By investing in local research, strengthening manufacturing capacity, and engaging in science diplomacy, Pakistan can reduce its dependence on external sources and be better prepared to face future diseases and pandemics. This approach will also position the country as a key player, contributing to regional and international efforts to ensure equitable access to vaccines and improved public health outcomes.

Recommendations

Science diplomacy is a vital area for Pakistan to focus on. Pakistan needs to increase funding for scientific research to stimulate innovation and enhance its scientific capabilities. Regional funding bodies, similar to the EU's flagship Horizon program, can be established to promote joint research on regional challenges.[65]

More so, regional collaboration can be enhanced by deepening ties with neighboring countries as well as Central Asian states. This approach may include joint research initiatives, technology transfer, and knowledge exchange programs to harness shared resources and expertise for the benefit of mutual growth and development.

In order to close the communication gap between scientists, decision-makers, and the general public, science communication training programs can be initiated.

Pakistan should focus on harnessing scientific expertise to address national and regional challenges, such as climate change, public health crises, and food security, through diplomatic channels. For this, ensuring simple and quick visa access for scientists in the region by allowing them to travel to attend conferences or collaborate on projects is needed.

There is a need to appoint experienced professionals as "tech diplomats" to act as intermediaries between scientific communities, governments, and international stakeholders. These tech diplomats should have a deep

[65] Monir Uddin Ahmed, et.al, "An Overview of Science Diplomacy in South Asia," *Science & Diplomacy*, February 17, 2021, https://www.sciencediplomacy.org/article/2021/overview-science-diplomacy-in-south-asia.

understanding of both foreign policy and science and technology to effectively facilitate collaboration, negotiate agreements, and advance science and technology diplomacy globally. The Netherlands pioneered this approach in May 2017 by appointing its first tech diplomat to Silicon Valley, California, a move that proved highly successful. Since then, numerous countries around the world have followed suit by appointing their own tech diplomats.

In light of the COVID-19 experience and global vaccine nationalism, Pakistan has an opportunity to take a leading role in vaccine development partnerships as part of regional health security initiatives. Establishing a self-sustaining vaccine development hub, backed by science diplomacy, would enable Pakistan to lessen its reliance on external suppliers for critical health resources while strengthening health resilience across the region.

On 30 July 2025, Pakistan approved the National Artificial Intelligence (AI) Policy 2025, which aims to establish a robust governance structure through the creation of an AI Council, the publication of a regulatory framework, and the introduction of AI Innovation and Venture Funds. It also aims to train one million AI professionals by 2030.[66] By aligning its standards with international best practices and fostering institutional partnerships, Pakistan can proactively engage with leading nations in AI, such as the US, China, and the European Union, to secure technical expertise, attract foreign investment, and participate in global forums.

According to the Global Electricity Review 2025 report, Pakistan imported a remarkable 17 GW of solar panels in 2024, placing the country among the world's top solar markets.[67] To accelerate Pakistan's solar transition, the government should leverage strategic partnerships with China and the EU, which are leaders in solar technology, to promote technology transfer, joint research and development, and capacity-building programs.

Conclusion

Pakistan has made notable advancements in science diplomacy through various initiatives at both bilateral and multilateral levels, but substantial untapped potential exists to further leverage this approach for the country's

[66] Sohail Rao, Pakistan's National AI Policy in 2025, A Comparative Appraisal, Advantages, Risks, Execution, Pathways and Regional Benchmarks, *Innovapath: The Premium Journal Discovery and Innovation,* Vol 1, no 7 (2025), 1-12, https://doi.org/10.63501/2p23r912

[67] "Pakistan, Saudi Arabia Became World's Largest Markets for New Solar Installations in 2024 — Report." *Arab News*, Arabnews, April 14, 2025, www.arabnews.com/node/2596952/pakistan

socio-economic development. With a focus on strategic sectors such as the blue economy, food security, climate change, peaceful uses of nuclear technology, and the extraction of mineral resources, Pakistan has an opportunity to strengthen its science diplomacy efforts. By building and deepening collaborative partnerships in these areas, the country can not only achieve sustainable growth but also enhance its role as a responsible global actor committed to tackling pressing challenges.

To fully capitalize on the opportunities offered by science diplomacy, Pakistan can prioritize investments in human capital, cultivate a culture of innovation, and strengthen its institutional frameworks for international cooperation. This will require focused efforts to enhance research capabilities, improve education and training programs, and create an enabling environment that fosters scientific exchange and collaboration. Strengthening the country's scientific infrastructure and ensuring the effective retention of skilled professionals will be essential to creating a competitive and robust scientific community that can contribute to both national and global development. It will contribute not only to the country's socioeconomic development but also to the broader scientific and technological progress necessary to address shared global challenges. With determined effort and strategic planning, Pakistan has the potential to harness the full potential of science diplomacy, positioning itself as a key player in the pursuit of sustainable development, peace, and global cooperation.

BOOK REVIEWS

Pakistan-India Relations: Fractured Past, Uncertain Future
Aizaz Ahmad Chaudhary (Book Corner Pakistan, 2025) 320

Aizaz Ahmad Chaudhary's new book, titled *Pakistan-India Relations: Fractured Past, Uncertain Future*, provides a timely and comprehensively informed account of one of South Asia's most enduring rivalries between two regional nuclear powers, Pakistan and India. Aizaz Ahmad Chaudhary has dedicated almost four decades to the Foreign Service of Pakistan, culminating in his appointment as Foreign Secretary from 2013 to 2017. His distinguished career also includes serving as Ambassador of Pakistan to both the United States and the Netherlands, as well as holding the position of Deputy Permanent Representative of Pakistan to the United Nations in New York. In addition, he has represented the Ministry of Foreign Affairs as its spokesperson.

Drawing upon decades of diplomatic experience, Chaudhary's book unpacks the historical, political, and strategic factors that shape Pakistan-India ties. His work traces the roots of Muslim-Hindu nationalism to the sixteenth century, leading to the partition of British India into Pakistan and India in 1947, and post-independence political developments climaxing in the most recent episodes of crisis and confrontation of 2025.

The book contains eight chapters in a structured manner, from historical context to contemporary geopolitical developments. It offers readers a clear, policy-oriented, and well-researched analysis of bilateral ties defined by mistrust, competing nationalisms, unresolved disputes, and intermittent yet fragile attempts at reconciliation. The book is written with conviction, clarity, and analytical precision, giving a blend of history, present, and forward-looking strategic guidance. The book, unlike most literature available, is not a polemical account but rationally advocates the perspective of Pakistan, security concerns, and diplomatic posture. He criticizes India for undermining efforts at consolidating peace with Pakistan through its rigid strategic outlook, domestic political shifts. He also points out India's use of terrorism as a political tool, and its reluctance to address the Kashmir dispute and its pursuit of regional hegemonic designs.

The introductory chapter titled, 'Historical Overview' lays out a concise historical explanation of factors shaping Muslim and Hindu nationalism over centuries, and how this historical baggage continues to dictate bilateral ties between the two countries. The chapter briefly touches upon the challenges faced by Pakistan as a nascent state and how both states got themselves embroiled in an enduring rivalry and mistrust, resulting in the wars of 1948, 1965, 1971, and 1999. The author mentions the diplomatic turning points, including the bifurcation of East Pakistan, now Bangladesh, in 1971, the Simla Agreement, Indian nuclearization of South Asia by conducting nuclear tests in 1974, the Lahore Declaration, and post-1998 nuclear tests. The chapter ends with a discussion of Prime Minister Narendra Modi's era of hyper-Hindu nationalism and its practical manifestation during the May 2025 crisis. Moreover, the author argues that India's effort to engage Pakistan in a full-fledged conventional war below the nuclear overhang would increase the risk of nuclear war in South Asia.

In Chapter 2, titled 'The Leadership Factor,' the writer explains the important role of leadership in managing the India-Pakistan relations. Starting from Muhammad Ali Jinnah, Mohandas Karamchand Gandhi, Jawaharlal Nehru, Vallabhbhai Patel, and Maulana Abul Kalam Azad to contemporary leaders, such as Prime Minister Mian Shahbaz Sharif and Narendra Modi, he explains how leadership personalities, political incentives, and domestic pressures have influenced and shaped bilateral ties. He notes that PM Vajpayee's visit of 1999 and Musharraf-Manmohan discussions in the mid-2000s gave a ray of hope, yet these overtures were fragile, often undermined by mutual mistrust.

In Chapter 3 titled 'The Kashmir Dispute', the author has introduced the Kashmir dispute as a central bone of contention between the two states. He highlights Pakistan's position of recognizing Kashmir as an internationally recognized dispute under United Nations Security Council (UNSC) resolutions and must be resolved in line with the aspirations of the Kashmiri people. This chapter offers a clear critique of India's evolving strategy in Kashmir, from its unilateral measures to the illegal alteration of the legal and demographic status of the region.

The author, in Chapter 4 of the book, 'Shadows of Terrorism, discusses in detail the terrorism narrative, which is often used by India to selectively avoid meaningful dialogue with Pakistan. While he acknowledges Pakistan's internal struggle with militancy, he outlines how effectively Pakistan has taken extensive measures to dismantle terrorist networks and has cooperated with the international community in combating the menace of terrorism.

In Chapter 5, titled 'Geopolitical Crosswinds,' the author explains how the major global developments, including the World Wars, the Cold War, decolonization, and America's unipolar moment, leading to the spread of liberal democracy and market economies through the Washington Consensus, had implications for the world, including South Asia. He then explores how 9/11, instability in Afghanistan, US-China rivalry, and India's hegemonic designs in South Asia have influenced Pakistan-India relations.

In Chapter 6, titled 'May 2025 Confrontation,' the author explains how this episode of heightened tensions risked escalating into a larger conflict, possibly a nuclear war. He holds India responsible for its attempts to engage Pakistan in conventional warfare below nuclear overhang and argues that India learned it cannot overwhelm Pakistan even at the conventional level. He reaffirms that nuclear South Asia cannot afford adventurism or the weaponization of domestic political agendas. He expresses his concerns about the weakening of rules-based order leading to militarization and arms build-up, which can pose dangers to the regional stability of South Asia.

In Chapter 7, titled 'Cold Peace - The Struggle for Peaceful Coexistence', the writer highlights that the weakening of the unipolar system is compelling many states to reconfigure their alliances, reshape traditional alliances, and intensification of great-power competition. He argues that this polarized environment should push India and Pakistan to create conditions for protecting the region from 'emerging geopolitical rivalries' and growing 'geoeconomic disarray'.

Chapter 8 of the book 'Forging a New Dawn' stated that there is an urgent need for both countries to create pathways toward peace and harmony for the people of Pakistan and India. For peace and security, he proposes a

three-point sequential agenda of bilateral engagement to minimize the risks of a kinetic confrontation. For lasting peace, he emphasizes that resolving the Kashmir dispute is important, followed by a mutual understanding and cooperation on joint counterterrorism efforts. He also calls for sustained and substantive nuclear dialogues to strengthen strategic stability. Among Confidence Building Measures (CBMs), he maintains that the efficient working of the Indus Waters Treaty (IWT) is a key prerequisite.

In 'Concluding Thoughts,' the author reiterates the main argument of the book and states that peaceful coexistence between two nuclear adversaries is the only viable path forward. He argues that this can only be possible if bilateral ties are not interpreted through the historical baggage of hostility and enmity but through the enduring interests and aspirations of their citizens.

The writer has enhanced the informed scholarship of the book by incorporating interviews of academicians, politicians, and leading national and international researchers, making the book an impartial and non-partisan asset for readers. By accepting shortcomings on Pakistan's part as well, the author has provided a candid avenue for discussion for both parties to find common ground and revisit their strategic discourses.

However, one aspect that was clearly overlooked was the one-sided explanation of the evolution of Muslim nationalism in South Asia. The writer has confined his research to the political struggle led by Sir Syed Ahmad Khan without mentioning at length the Muslim religious movements, such as the work of Darul Uloom Deoband, the Barelvi Movement, and the Khilafat Movement, among others. It is important to study these movements as they are essential for understanding Pakistan's current strained relations with Afghanistan and the cross-border religious linkages between Indian and Pakistani seminaries, which continue to shape bilateral ties. A detailed scholarly analysis of these movements would help Pakistan better address the multiple dimensions of rising extremism and terrorism within Pakistani society today.

Overall, the book is a valuable contribution to the literature on Pakistan-India bilateral relations from a distinctly Pakistani perspective. The main

argument of the book is that the bilateral dialogue, though challenging, remains indispensable for peaceful coexistence. Without sustained engagements, the bilateral relationship would likely remain trapped in recurring cycles of tension and escalation.

Reviewed by Mobeen Jafar Mir, Research Officer at the Center for International Strategic Studies (CISS), Islamabad.

Going Nuclear: How the Atom Will Save the World
Tim Gregory (London: Bodley Head, 2025) 384

The book 'Going Nuclear: How the Atom Will Save the World' by Tim Gregory (PhD) is a seminal commentary on the enduring relevance of nuclear science. While the world struggles to find practical ways to achieve global net-zero, this book emerges as a timely contribution. Tim Gregory, a nuclear chemist within the British nuclear enterprise, a renowned author, and a regular presenter on British Broadcasting Corporation **(**BBC) Science, brings both expertise and passion to the nuclear discovery delights in the book. He employs scientific literacy and rational optimism to dispel decades-old fears of nuclear science. With his blend of human warmth and scientific proficiency, he deconstructs complex global security challenges and impediments to their nuclear solutions. The author articulates net-zero technologies, nuclear science, and nuclear energy through scientific reasoning.

Gregory's thirteen-chapter monograph offers a wide-ranging and well-organized overview of nuclear science, tracing its intellectual trajectory from mythological origins to contemporary technological applications. In the opening chapters, he explains how the atom appears in both cultural imagination and empirical inquiry, moving from Promethean myths to the experimental validations of Röntgen, Becquerel, and Curie. This dual framing highlights the persistence of symbolic anxieties surrounding nuclear energy, even as its foundations rest upon reproducible observation and measurement. The main argument of the writer is that nuclear science, often portrayed as mysterious or uncontrollable, is in fact rational, comprehensible, and amenable to systematic management. By starting with the cultural and historical story of atomic discovery, he sets the interpretive lens through which subsequent technical and political discussions are to be understood.

The scientific foundations of nuclear power are then elaborated in detail, encompassing the nuclear fuel cycle, reactor physics, isotopic enrichment,

and atomic criticality. Gregory recalls the landmark experiments of Rutherford, Blackett, and Fermi, situating them within the broader empirical lineage of nuclear knowledge. These technical discussions provide the basis for addressing contentious issues such as radioactive waste and nuclear accidents. He emphasizes that the total volume of high-level waste produced globally could fit within a modest concert hall, and that a one-gigawatt reactor generates approximately thirty tons annually, equivalent to thirty grams per person or the weight of a few grapes. By reframing waste as a manageable technical problem rather than an existential threat, Gregory challenges prevailing alarmist narratives. His treatment of accidents is similarly comparative and evidence-driven. Chernobyl resulted in 30 to 35 immediate fatalities and fewer than 100 thyroid cancer deaths; Fukushima caused none, while nearly 20,000 deaths were attributable to the earthquake and tsunami that precipitated the event. Gregory contrasts these figures with hydroelectric disasters such as Banqiao, which claimed approximately 171,000 lives, thereby situating nuclear risk within a broader energy context and demonstrating that nuclear energy is not uniquely perilous when compared to other energy sources.

The middle chapters advance the discussion by examining peaceful nuclear applications, which Gregory presents as some of the most compelling evidence of nuclear energy's versatility. He documents the role of 160 gamma-irradiation facilities that sterilize roughly 40 percent of single-use medical devices worldwide, and notes the extension of food shelf life for astronauts through similar technologies. He highlights the International Atomic Energy Agency and United Nations Mutant Variety Database, which records more than 3,400 cultivars generated through atomic gardening, producing disease-resistant and nutritionally enriched crops. The Sterile Insect Technique, which irradiates pests without killing them, is credited with preventing one billion dollars in agricultural losses across North and Central America. Nuclear forensics further illustrates the breadth of application, from tracing smuggled rhino horns to investigating Litvinenko's polonium-210 poisoning and recovering a lost radioactive capsule in the Australian outback. Collectively, these examples underscore nuclear science as a versatile instrument of progress rather than a cultural

specter, and they demonstrate the extent to which nuclear technologies have already become embedded in diverse aspects of modern life.

The concluding chapters extend the analysis to geopolitical and futuristic dimensions. Gregory examines recycling practices at France's La Hague facility, where mixed-oxide fuel is produced, and explains the function of fast-breeder reactors in generating plutonium-239 from uranium-238. He envisions nuclear energy as central to space exploration, enabling the electrolysis of water ice into oxygen and hydrogen propellants, reducing transit times to Mars, increasing payload capacity, and mitigating cosmic radiation exposure. In this context, nuclear technology emerges as both a terrestrial resource and a cosmic enabler, integral to sustaining life beyond Earth. Gregory's discussion of nuclear energy in space situates the atom not only as a driver of terrestrial progress but also as a fulcrum for humanity's expansion into extraterrestrial environments.

Taken together, Gregory's work advances a consistent and carefully evidenced argument. Nuclear energy is neither inherently uncontrollable nor uniquely perilous, but a rational and versatile technology whose risks are measurable and manageable. By weaving cultural history with technical evidence, the book reframes nuclear science as a domain of practical engagement and innovation. It challenges alarmist discourse, destabilizes entrenched narratives of fear, and positions nuclear power as indispensable to sustainable futures. In doing so, Gregory contributes not only to the technical literature on nuclear energy but also to the broader historiography of science and technology, offering a corrective to cultural misperceptions and a foundation for policy grounded in empirical evidence rather than symbolism.

Every chapter opens with an engaging narrative, followed by a simple, balanced scientific background of the concept, and concludes with contemporary challenges and their convincing answers. The clarity, his greatest strength, ensures a balanced take without overwhelming readers with the scientific details. The profound passion of the author eases the complex concepts of reactor engineering, advanced physics, radiobiology, and aerospace technology lucidly. Through his scientific rigor, persuasive

style, intelligent wit, and apt examples, he tackles highly controversial topics, as radiophobia, by presenting facts and figures. Another scholarly strength of the book is the use of deeply researched, well-referenced sources, including peer-reviewed studies, authentic data, and historical records that establish his authority on the topic.

However, some areas could have been expanded on to bring clarity. Among them, the nuclear economics comes first as it is the most widely used argument in the nuclear energy critique. More emphasis by the writer on the cost of the nuclear technology, such as maintenance and decommissioning costs, could have better assessed the viability of this option. Furthermore, global nuclear technology equity is another underexplored area by the writer. Similarly, the regulatory and licensing challenges received his partial attention, which are critical to the discussion of nuclear feasibility. Additionally, the techno-optimism, especially in the radioactive deterrents in wildlife, nuclear fuel supply, and uranium mining, could have been better balanced with a sufficient appraisal of the logistical and ethical concerns. The geopolitical sensitivities, socioeconomic dynamics, and environmental justice are key players in nuclear adoption trajectories. Such an omission risks sustaining the persistent gaps between the nuclear energy utopia and real-world constraints.

Overall, the central argument of the book is that the atoms are a viable pathway for solving the most pressing challenges humankind faces today. The author juxtaposes the significance of nuclear science by logically explaining the limitations of renewable energy sources. From energy security to food security, climate security, and health security, nuclear science has proven to be a sustainable course. Through his deep expertise, Gregory developed the account of nuclear science, turning it from abstract radiophobia into a manageable and immense source of energy.

Reviewed by Anam Murad Khan, Research Assistant at the Center for International Strategic Studies (CISS), Islamabad.

Weapons in Space: Technology, Politics, and the Rise and Fall of the Strategic Defense Initiative (Massachusetts Institute of Technology Press, 2024), 336

Militarization of space is not science fiction anymore, but it has transformed into an important security front. The book 'Weapons in Space: Technology, Politics, and the Rise and Fall of the Strategic Defense Initiative' was written by Aaron Bateman, who is an Assistant Professor of History and International Affairs at George Washington University and a member of the Space Policy Institute. He has published widely on intelligence, transatlantic relations, and the military use of space during the Cold War and beyond. For scholars and policy makers in Pakistan, the work of Bateman is not just a history lesson; it is a road map that one must have to master in the long-term perilous combination of technology, strategy, and politics in space. This book provides a pertinent historical revelation of the program that sets the stage for the "Strategic Defence Initiative (SDI)." By depending on declassified American, Soviet, and British documents, the space policy historian puts forward the argument that the SDI was not just a pipe dream in terms of its technology. It was an influential strategic and political power that changed the balance of the Cold War. Its legacy continues to affect great power politics to this day.

According to the author, it is possible to view SDI, which is popularly referred to as Star Wars, as a triangle of political ideology, strategic calculation, and technological ambition. He demonstrates that President Reagan was no empty talk when he opposed the theory of Mutual Assured Destruction (MAD); he preferred a policy that would eliminate deterrence in favour of active defence. This aspiration came into collision with reality at once. As he analyses the US defence establishment, there are strong divisions between policymakers, military strategists, and scientists. The tension between strategic stability and technological promise is highlighted by the fact that their fierce discussion on the viability of SDI has occurred. The debate over innovation and stability is one of the main themes that resonates with the contemporary discourse on new technologies.

Weapons in Space

Among the most interesting parts of the book is the account of the transatlantic schism which SDI initiated. The writer goes beyond the US versus Soviet dichotomy to demonstrate how European allies (primarily France and West Germany) publicly criticised the plan because it was destabilising their strategic position. Meanwhile, they manipulated their way to get profitable defence deals and spin-offs of technology. Such a two-sided approach revealed the tensions of NATO, where national economic interests were, in many cases, opposing the common rhetoric of security. This analysis can be of important use in terms of the insight into the intricacies of modern alliances and the inherently hypocritical character of the non-proliferation discourses propagated by the great powers.

Moreover, he follows the bureaucratic and institutional life of SDI in a very clear manner. He demonstrates that although the program did not succeed but it produced a self-sustaining ecosystem. An unprecedented flow of cash solidified a formidable alliance of Pentagon officials, national laboratories, and defence contractors, comprising a contemporary military-industrial complex in space. With the end of the Cold War, this infrastructure never disappeared. Rather, it laid a foundation for the successor organisations, including the Missile Defence Agency (MDA). The author makes a convincing point that, although deploying a space-based shield was the official triumph of SDI. The real victory of the program lay in ensuring that the quest for missile defence and control of space was entrenched in the national security policy of the United States. This quest has been the direct cause of the modern space arms race.

This historical origin makes the book extremely relevant in the present times. The author in the chapter SDI reconsidered that a Sense of Deja vu creates a direct connection between the Cold War and the current geopolitics, with references to the resurgence of anti-satellite (ASAT) tests, the establishment of special space units, and the hypersonic weapon development. This is where the argument in the book has far-reaching consequences on the security of South Asia. With the display of ASAT in 2019, India scored a decisive move on its own space militarization of the region, which has completely changed the calculus of the move. The Bateman's framework demonstrates that this did not happen in a vacuum

but was a continuation of an expected trend. Space weaponization is a familiar strategy brought by the emerging powers to gain a strategic edge and political glory. The Cold War issues that Bateman writes about, arms vulnerability, blurred defensive and offensive intent, and the breakdown of arms-control dialogues, no longer belong to history; they have now become the new reality of the Asia-Pacific.

Although the book has its strengths, it also has limitations which should be critically analysed primarily in the US context. Though he also considers the Soviet reactions, it would have been better to take another glance at the parallel research and strategic calculations of the Soviet Union. As a whole, the intent was to get a better view of the world in a more global perspective. Additionally, due to the high concentration on technology in the work, it does not succeed in offering a finer technical analysis occasionally. A further exploration of the engineering breakdowns that killed projects like space-based lasers would have made his own criticism of the technological over-promising of the program sharper.

Overall, this book is an essential contribution to the study of security and the history of strategies. The author determines that the heritage of SDI resonates to this day in the decision-making masculinities of Washington, Moscow, and Beijing. Moreover, it shows how one program can erode decades of dogma, serve as a catalyst in a new arms race, and leave footprints that are difficult to stop. The main point is that space weaponization is not an apolitical technical step, but a highly political one with far-reaching, destabilising consequences. As Pakistan enters this new frontier, the work by Bateman can provide the historical context, and the analytical instruments can enable an understanding of the possible challenges ahead.

Reviewed by Haseeb Ahmad, a graduate of the National Defence University (NDU), Islamabad.

List of Acronyms

AAAS	American Association for the Advancement of Science
AI	Artificial Intelligence
ASAT	Anti-Satellite weapon
BJP	Bharatiya Janata Party
BLA	Baluchistan Liberation Army
BRI	Belt and Road Initiative
CBMs	Confidence Building Measures
CEPI	Coalition for Epidemic Preparedness Innovations
CERN	European Organization for Nuclear Research
CMF	Civil-Military Fusion
COMSTECH	Committee on Scientific and Technological Collaboration
CPEC	China-Pakistan Economic Corridor
CPJRC	China-Pakistan Joint Research Centre
CTBT	Comprehensive Nuclear-Test-Ban Treaty
C5	Chashma 5
DCA	Dual-Capable Aircraft
DCVMN	Vaccine Manufacturers Network
DRS	Dynamic Response Strategy

List of Acronyms

EDA	Electronic Design Automation
EU	European Union
FMCT	Fissile Material Cut-off Treaty
GDP	Gross Domestic Product
HEC	Higher Education Commission
IAEA	International Atomic Energy Commission
ICCBS	International Center for Chemical and Biological Sciences
ICTP	International Centre for Theoretical Physics
ICTs	Information and Communication Technologies
IGGP	International Geoscience and Geoparks Programme
IHP	International Hydrological Programme
IIOJ&K	Indian Illegally Occupied Jammu & Kashmir
IMF	International Monetary Fund
INF	Intermediate-Range Nuclear Forces Treaty
IORA	Indian Ocean Rim Association
IPCC	Intergovernmental Panel on Climate Change
IP	Intellectual Property
IPOI	Indo-Pacific Oceans Initiative

List of Acronyms

IRBMs	Intermediate-Range Ballistic Missiles
IS	Integrated Circuit
IS-KP	Islamic State–Khorasan Province
ISS	International Space Station
ITU	International Telecommunication Union
IWT	Indus Water Treaty
KPK	Khyber Pakhtunkhwa
LEP	Life Extension Program
LoC	Line of Control
MIC	Made in China
MIIT	Ministry of Industry and Information Technology
MOF	Ministry of Finance
MOST	Ministry of Science and Technology
MoU	Memorandum of Understanding
MTCR	Missile Technology Control Regime
NASTP	National Aerospace Science and Technology Park
NATO	North Atlantic Treaty Organization
NFU	No First Use
NIH	National Institute of Health
NNWS	Non-Nuclear-Weapon State
NOAA	National Oceanic and Atmospheric Administration

List of Acronyms

NPG	Nuclear Planning Group
NPT	Nuclear Non-Proliferation Treaty
NSIIF	National Security Industry Investment Fund
NSG	Nuclear Suppliers Group
NSSC	Nuclear Security Support Center
NUST	National University of Science and Technology
OIC	Organization of Islamic Cooperation
PAEC	Pakistan Atomic Energy Commission
PAF	Pakistan Air Force
PAL	Permissive Action Link
PCENS	Pakistan's Center of Excellence and Nuclear Security
QPQ+	Quid Pro Quo Plus
REEs	Rare Earth Elements
RSS	Rashtriya Swayamsevak Sangh
SCO	Shanghai Cooperation Organization
SDGs	Sustainable Development Goals
SDI	Science Diplomacy Initiative
SESAME	Synchrotron-Light for Experimental Science and Applications in the Middle East Project
SIPRI	Stockholm International Peace Research Institute

List of Acronyms

SMIC	Semiconductor Manufacturing International Corporation
SRR	Strategic Restraint Regime
START	Strategic Arms Reduction Treaty
SUPARCO	Space and Upper Atmosphere Research Commission
TAF	Turkish Air Force
TPNW	Treaty on the Prohibition of Nuclear Weapons
TSMC	Taiwan's Semiconductor Manufacturing Company
TTP	Tehrik-Taliban Pakistan
TWAS	World Academy of Sciences
UAE	United Arab Emirates
UET	University of Engineering and Technology
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
UNSC	United Nations Security Council
UPCAS	US-Pakistan Centers for Advanced Studies
US	United States

List of Acronyms

USAF	US Air Force
USAID	United States Agency for International Development
USSM	US Strategic Metals
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WMD	Weapon of Mass Destruction
WMO	World Meteorological Organization
YMTC	Yangtze Memory Technologies Corporation


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