Autonomous Weapons Systems and the Changing Security Dynamics of South Asia

Regional Studies
Vol 42, Issue 1
pp.3-32

http//irs.org.pk
P-ISSN: 0254-7988
E-ISSN:2959-5459
Date of Acceptance: 4 March 2024
Published Online: 25 July 2024

Summar Iqbal Babar* and Abu Hurrairah Abbasi**

Abstract

Autonomous Weapons Systems (AWS), which can function without human intervention, are on the verge of causing substantial changes to the security dynamics of South Asia. Many states are currently developing AWS technologies capable of targeting without human direction. Thus, the potential exploitation of such technologies by nuclear-armed states might potentially enhance the risk of war. The advancement of AWS technologies significantly changes military strategy as they impact crisis stability, escalation management, and deterrence. India's endeavours to establish a self-sufficient military-industrial complex demonstrate its dedication to enhancing its AWS capabilities. These advancements substantially affect the region's stability, as India's AWS development is perceived as altering the security calculus and deterrence dynamics between India and Pakistan in South Asia. This paper examines the dual role of AWS in the strategic stability of South Asia and highlights the need for Pakistan to formulate a balanced deterrent strategy amidst evolving regional dynamics.

Keywords: *South Asia, security, Autonomous Weapon System (AWS), deterrence, stability, warfare*

Introduction

The rapid advancement of autonomous weapons systems (AWS), particularly in drone warfare, has garnered increasing attention

* Dr Summar Iqbal Babar is an Assistant Professor at the School of Politics and International Relations (SPIR), Quaid-i-Azam University (QAU), Islamabad. Corresponding Author: Dr. Summar Iqbal Babar
E-mail: summar.rao@qau.edu.pk

** Mr Abu Hurrairah Abbasi is a graduate of International Relations from SPIR, QAU, Islamabad.

within the field of International Relations in recent years. However, certain critical aspects have historically been overlooked in the academic and policy discourse. These facets include some implications of their use, the dynamics of human-machine collaboration in decision-making, the long-term strategic implications, the increasing role of non-state actors in deploying these systems, and the societal perceptions and public opinions surrounding their adoption. One of the key characteristics of AWS is its capacity to function independently. Once triggered, such robotic weapons can identify and engage targets without requiring additional human involvement. AWS stands out due to its increasing autonomy, moving from basic responsiveness to human-level cognitive capabilities. These systems can autonomously detect, recognise, and engage targets with aggressive force upon activation, surpassing remote-controlled devices like drones.[1]

Most contemporary weapons systems are equipped with computer-based technology, which has led to a continuous expansion of the responsibilities delegated to these programs. However, the autonomous nature of weapons systems generally pertains to their capacity to engage in cognitive processes and exercise decision-making capabilities within a specific technical framework. This capability is the foundation for seeking and discerning targets within a predetermined set of parameters, utilising sensor information. The robotics industry is currently engaged in the ongoing development of dual-use technologies and increasingly AWS.[2] Consequently, implementing these systems may soon become an inevitable reality. Regardless of their potential advancements in technology, it is evident that autonomous weapons systems deemed dumb, necessitate immediate analytical scrutiny.[3]

India has recognised the imperative need to establish a domestic military-industrial complex capable of effectively addressing the evolving security challenges of the 21st century. Prime Minister

Narendra Modi's 'Make in India' program offers a promising avenue to address this imperative.[4] Notably, Indian technological giants such as *Infosys* and *Tata Technologies* have already ventured into Artificial Intelligence (AI) and robotics.[5] To bridge the existing disparity and facilitate the development and militarisation of autonomous systems, Indian political leadership envisions a collaborative framework that encourages civilian groups to cooperate with entities like the Defense Research and Development Organisation (DRDO).[6]

Furthermore, India acknowledges the gap in its technological advancements compared to global powers and contemplates positioning itself as an importer of such technology to address this deficit. In this pursuit, the United States, as one of the dominant leaders in AI technologies, emerges as a strategic partner for India in autonomous technologies. The bilateral initiative known as the US-India Defense Technology and Trade Initiative (DTTI), solidified in 2012[7], has laid the groundwork for collaboration in defence technologies between the two countries. The US-India Defense Technology and Partnership Act, currently under deliberation in the US Congress, seeks to officially recognise India as a significant ally of the United States and ease export control limitations to facilitate technology transfer. Discussions between India's Minister of Defense, Manohar Parrikar, and the US Secretary of Defense, Ash Carter, had further cemented commitments to collaborative endeavours. India has maintained this momentum and harnessed its collaboration with the US to attain the military benefits of emerging technologies.[8]

Consequently, it is improbable that AWS would supplant human beings in this context (in the near term) due to the negligible amount of time saved. If this assertion is accurate, the legal intricacies of AWS will experience a notable decrease. Nevertheless, the efficacy of autonomous systems in other capacities, including targeting, surveillance, and damage assessment, will remain unaltered. Automation in these roles will substantially benefit a particular entity,

making it imperative for countries such as India to engage actively in research and development endeavours about autonomous systems.

This research paper explores how autonomous weapon systems shape South Asia's security dynamics and the possible options for Pakistan, given India's pursuit of the AWS. This paper will embrace a descriptive-analytical research methodology incorporating qualitative data collection and analysis techniques. The paper also utilises a comprehensive literature review of existing research on AWS and its development by India, impacting the strategic dynamics in South Asia. Additionally, the research concludes potential options for Pakistan in response to this evolving security landscape.

Background

The literature concerning AWS and its influence on regional security dynamics is developing rapidly. Researchers from various fields have investigated the effects that AWS could have on crisis stability, escalation management, and deterrence measures. Many studies have focused their attention on the transformative potential of AWS in terms of altering military doctrines and strategies.

The research conducted by Jurgen Altmann and Frank Sauer[9] sheds light on the breakthroughs made in AWS technology. These advancements emphasise the potential of these technologies to change conventional warfare and their role in maintaining strategic stability. According to the study's findings, the increasing autonomy of these systems may result in a quicker decision-making process in combat scenarios. Furthermore, these systems are projected to increase the likelihood of crisis instability and escalation threats.

Multiple studies examine the consequences of emerging technologies, such as AWS, for regional security dynamics, specifically in South Asia. Summar Iqbal Babar and Abu Hurrairah Abbasi[10] analyse the strategic incentives driving India's efforts to create technology, connecting it to broader geopolitical goals and technological ambitions. The paper examines the potential for India's technological

progress to trigger competition in the region for military armaments, thereby impacting Pakistan's security strategies. Thus, the research that has been conducted highlights the multidimensional impact that AWS has had on military strategy and regional security dynamics. Using the above insights as a foundation and then developing a context for South Asia, this paper investigates the specific implications for South Asia and makes policy recommendations that Pakistan might implement.

Theoretical Framework

The emergence of AWS in South Asia, characterised by their ability to operate without direct human control, introduced a paradigm shift in military capabilities, raising concerns about their impact on regional stability. 'Technological determinism'[11] argues that technologies have the potential to alter security dynamics significantly. This deterministic impact of AWS on South Asia's security dynamics is evident in the potential reshaping of military strategies and doctrines. The inclusion of AWS by India will create a perceived imperative for Pakistan in the region to adopt or counter this technology, leading to an arms race and alterations in defence priorities to maintain strategic parity. This may result in an environment where the adoption of AWS becomes a strategic necessity rather than a discretionary choice.

Moreover, India's adoption of AWS will impact the existing status quo of strategic stability in South Asia, putting Pakistan in a situation where it may strategically substitute traditional military approaches with cutting-edge autonomous capabilities. 'Strategic Substitution' argues that if one state invests in and integrates any technology into its military strategy, it introduces a new dimension of strategic choice that reverberates among other states. Thus, India's decision to deploy AWS prompts strategic recalibrations as Pakistan assesses the impact on its security calculus. This dynamic interplay reflects the essence of strategic substitution,[12] as Pakistan is compelled

to reevaluate and potentially alter its military strategies because of India's actions. In the face of this technological evolution, South Asia is experiencing a shift from conventional strategies to a more nuanced and technologically sophisticated approach, emphasising the need for a strategic substitution that influences the changing security dynamics.[13]

It is evident from the historical transformation brought about by nuclear weapons, ushering in an era of strategic stability and altering international relations, which serves as a precedent for anticipating the potential impact of AWS on the strategic calculus of South Asia. The deployment of AWS may prompt a re-evaluation of the region's military doctrines and force structures, as the nuclear capabilities did in the past. Similar to how nuclear weapons have shaped geopolitical dynamics, AWS can reshape South Asia's security landscape, necessitating careful consideration of the implications for deterrence.[14] Therefore, the introduction of AWS marks a critical juncture in the region's military capabilities, potentially altering the calculus of conflict.

Development of India's Autonomous Weapons Systems

The inevitability of the proliferation of AWS is more apparent due to technological advancements, and it is anticipated to enhance the military dominance of the world's major powers.[15] In light of the heightened emphasis placed by Russia and China on military progress, the United States (US) is undertaking a substantial allocation of funds towards the research and development of cutting-edge technology, surpassing previous levels of investment. According to reports, the Pentagon has allocated $18 billion for its Future Years Defense Programme as a component of its third-offset strategy.[16] Much of this sum has been designated to facilitate collaboration between humans and machines and advance cyber and electronic warfare capabilities. These projects will encompass programs that facilitate human-machine collaboration, encompassing advanced decision-making

processes and the advancement of exoskeleton suits and unmanned platforms. This statement conveys the inclination and determination of the largest global military power to develop and utilise autonomous weaponry. Similarly, France has endeavoured to uphold the legitimacy of creating and utilising autonomous weapons within the International Humanitarian Law (IHL) framework.

Indian military forces believe that the emerging technologies significantly alter the battle landscape. During a webinar held in June 2021, General Manoj Mukund Naravane, the former Chief of the Indian Army, recognised the significant influence of technology in defining forthcoming conflicts.[17] He stated that it would be reasonable to deduce that technology is increasingly becoming a fundamental capacity in its own right. According to General Naravane, traditional methods of warfare, which heavily relied on 'large platforms' such as tanks, artillery, fighter planes, and capital ships, are expected to become comparatively less significant.[18] AWS has emerged as the most significant disruptive technology within this context. The AWS encompasses the integration of self-mobility, self-direction, and self-determination. Weapons are exclusively present inside complete autonomy in the context of self-determination. Until now, the utilisation of AWS in military operations has primarily manifested through deploying Unmanned Combat Aerial Vehicles (UCAVs), commonly referred to as drones, as per military terminology. According to the Indian military decision-makers, it is believed that Unmanned Aerial Vehicles (UAVs), commonly known as drones, are anticipated to witness a growing utilisation in various forms of combat in the foreseeable future. This includes their deployment by both state and non-state actors. Consequently, the Indian military deems integrating drones into all forthcoming military strategies and operations essential. The significant focus on technology, namely unmanned weapons systems, has fostered a perception that

disruptive technological advancements have surpassed military weaponry.[19]

Autonomous systems have notable benefits compared to conventional weapons systems that rely on human operators. Autonomous systems offer a distinct advantage in decision-making and response time since they minimise one's decision-making process and enable more intervention in the adversary's decision-making cycle. Furthermore, AWS mitigates significant factors such as human tiredness, bewilderment, and cognitive limits arising from warfare's dynamic nature and the inherent challenges in comprehending complex situations.[20] In summary, using unmanned systems such as UAVs and UCAVs enables militaries to adopt a more risk-tolerant approach and exhibit a greater propensity for employing force. Moreover, these technologies contribute to managing the escalation ladder by mitigating the domestic reputational consequences of military actions. The loss of unmanned systems does not elicit the same pressures to respond as the loss of manned systems.

Autonomous Weapons and the Stability-Instability Paradox in South Asia

The quest for advanced technologies by powerful countries, particularly the competition between the US and China, has created complexities that affect the strategic stability of South Asia. Specifically, the US-India strategic partnership, aimed at countering China's influence, has presented security concerns for Pakistan. In the present scenario, India's pursuit of emerging technologies can potentially exacerbate the worsening of the strategic dynamics in South Asia. India's technological progress and the necessary changes in its doctrines in response to evolving global and regional political systems pose a challenge to the stability of deterrence in South Asia.[21]

Undoubtedly, over more than two decades, nuclear deterrence has yielded stabilising consequences strategically in India and Pakistan. This state of affairs has been characterised by a mutual lack of

motivation for a pre-emptive nuclear attack. Both rival powers effectively employed nuclear deterrence to prevent large-scale conflicts. Nevertheless, disruptive technologies have the potential to change the dynamics and nature of warfare[22], perhaps rendering total conflicts unfeasible while enabling the possibility of technologically-permitted and strategically-advantageous 'Smart Warfare'[23] that involves the integration of advanced technologies, AI, and data analytics to enhance military capabilities and decision-making, with a focus on precision targeting and minimising collateral damage.

The available literature indicates[24] that disruptive technologies can potentially undermine nuclear strategic stability by eroding deterrence and impacting many aspects of nuclear second-strike capabilities, such as Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR), and force postures. The influence of these technologies on nuclear deterrence is contingent upon the technological capabilities involved in their implementation and the comprehension of the force postures of the governments they may be used against. Furthermore, integrating new technologies is expected to significantly impact the potential for accidental or unintentional nuclear escalation due to the increased vulnerability of dual-use command and control assets on cyber and military grounds.[25] Additionally, the rapid advancement of technology may create time constraints for decision-makers, leading them to mistakenly believe that an enemy's nuclear attack is imminent and consequently decide on a nuclear response. The emerging technologies such as hypersonic weapons, drones equipped with AI-enabled AWS, space-based technologies, and cyber technologies, have detrimentally impacted doctrinal strategies and deterrence stability within this framework.

The incorporation of autonomous weapons systems into this scenario offers novel intricacies. These technologies, capable of functioning independently or with limited human intervention,

augment a nation's military capacities by facilitating prompt decision-making, accurate targeting, and operational effectiveness. The inherent characteristics that render these systems appealing also contribute to the paradox of stability and instability.[26] This paradox encompasses the concept that possessing advanced military capabilities, such as sophisticated autonomous systems, can promote stability by deterring large-scale conflicts and creating instability by enabling more minor conflicts and aggressive behaviours. The presence of a dynamic equilibrium characterised by stability at one level and instability at another presents complex obstacles for strategic decision-making, particularly in Pakistan.[27]

Lethal Autonomous Weapons Systems (LAWS), which rely on AI systems for their operation, necessitate a thorough understanding of how AI is inextricably intertwined with them. In March 2018, a task force comprising many stakeholders was established under the guidance of Prime Minister Modi and Defence Minister Singh to examine the application of AI from the standpoint of national security. Multiple branches within the Ministry of Defence (MoD) have implemented at least 75 AI products and technologies or are in the advanced stages of integrating these products into their operations.[28] India has developed the Multi-Agent Robotics Framework, intending to create a cohesive unit of robotic entities that might serve as a collective force to support the operations of the Indian Army.[29] Furthermore, the Indian Army has approximately 200 DAKSH Autonomous Robots, which can safely neutralise explosive devices in hazardous circumstances. These have been characterised as Remotely Operated Vehicles (ROV). India is collaborating with Japan in Robotics and AI, specifically focusing on their utilisation inside military systems. Similarly, India has been actively pursuing advanced applications of LAWS within its military domain. These include image interpretation, target recognition, determining the objective range, assessing the kill

zone of missiles, and employing robots in more advanced configurations.[30]

Both India and Pakistan are currently acquiring advanced drone technology, which may be utilised for military purposes in the future, potentially leading to a scenario where these drones are deployed against one another. In 2016, the Indian military officially declared their plan to acquire around 5000 UAVs by 2026, with an estimated expenditure of over US$3 billion.[31] India is now engaged in the development of an anti-drone system. It effectively employed a fleet of 74 kamikaze swarm drones equipped with combat capabilities to overpower the military platforms and targets of the adversary autonomously. India has just ordered a hundred kamikaze drones, which it jointly built with Israel. These drones are intended to be deployed at the Line of Actual Control, explicitly targeting China and along the Line of Control, aiming to counter Pakistan. The newly developed drone technology incorporates an electric engine propulsion system that emits reduced noise levels. Additionally, it is equipped with an autonomous navigation system, enabling it to operate covertly at low altitudes to engage the adversary.[32]

India is in the process of incorporating a total of twelve sets of armed drone swarms into its arsenal. Approximately seven autonomous Surveillance and Armed Drone Swarms (A-SADS) are outfitted with 50-75 AI-enabled aerial vehicles. These vehicles possess the ability to establish communication with control stations as well as with one another. The primary purpose of deploying these A-SADS is to cover regions at high altitudes. The remaining five sets can engage in offensive and defensive operations within plain and desert terrains.[33] The use of the A-SADS is expected to enhance the capabilities of field commanders by serving as a force multiplier. This advanced technology will facilitate effective Intelligence, Surveillance, and Reconnaissance (ISR) operations while enabling engagement with many adversary targets, including air defense systems, command and

control centers, artillery units, tanks, infantry combat vehicles, and ammunition and fuel storage facilities.[34]

Pakistan views these moves as highly provocative, potentially destabilising strategic equilibrium in South Asia and initiating a fresh arms race. The emergence of advanced technologies, including LAWS, coupled with India's substantial investment in this field, might shift the balance of power in favour of India within the South Asian region. Moreover, a significant portion of LAWS possesses the capacity to impact coercive techniques and escalation dynamics in crises and wars between India and Pakistan. Up to this point, the principle of deterrence has predominantly persisted in India and Pakistan, when humans have endeavoured to dissuade one another from pursuing unfavourable courses of action. The influence of automated systems on the credibility of deterrent threats in the South Asian region appears to be substantial.[35]

In the future, there is a potential for an increase in the level of control over autonomous weapons, specifically about their decision-making processes regarding timing and target selection. AI-enabled autonomous technologies have the potential to cause significant harm to the adversary. Implementing automated mechanisms has the potential to greatly influence the credibility of deterrent threats between two nuclear adversaries. The state with autonomous systems, whether India or Pakistan, may appear more credible in utilising deterrent threats against the other state without such systems.[36] However, governments without autonomous systems may be less susceptible to coercive threats from states possessing such capabilities due to reduced vulnerability to cyberattacks, limited dependence on high-tech infrastructure, and a focus on diverse military capabilities. Their emphasis on traditional military assets and alliances can act as deterrents, making it more challenging for states with autonomous systems to achieve their objectives through coercion.

Undoubtedly, states will endeavour to formulate their plans and acquire the necessary technological capacities to effectively address, prevent, or minimise the advantages presented by autonomous systems. If both opposing governments possess autonomous systems, the utilisation of such systems may be perceived as a low-risk occurrence. Hence, this might potentially incite countries in conflict to engage their opponents without transgressing established boundaries about nuclear weaponry. In February 2019, India implemented a compellence policy characterised by the restrained application of force against Pakistan. In response, Pakistan promptly maintained its deterrence capabilities. If India adopted an AWS that relies on a compellence strategy, which encompasses the threat or restricted use of force, it would introduce an additional level of escalation in the ladder of conflict, thereby undermining the stability of deterrence in the South Asian region.

In the given setting, the integration of autonomous technology in the Indian military has the potential to amplify its counterforce capabilities and increase the allure of employing it as a first-use option. The country may develop a sense of assurance in employing coercive measures against Pakistan and potentially even contemplate the possibility of a pre-emptive strike.

The deployment of LAWS amidst bilateral tensions between India and Pakistan could inadvertently escalate conflicts in a crisis-like situation. In order to counter potential threats from India, Pakistan may find it necessary to bolster its nuclear arsenal and upgrade delivery systems, aligning with its Full Spectrum Deterrence (FSD) strategy.[37] While FSD is designed to deter conflicts across various threat levels, introducing advanced autonomous technologies in the region raises concerns about disturbing the strategic balance. To effectively address these challenges, Pakistan must actively adapt to evolving technologies, ensuring its defence strategies remain robust

and responsive while adhering to the principles of responsible military advancement.

Perspectives of India and Pakistan on the Development of AWS

India and Pakistan have historically been engaged in an arms race, and any developments in the field of AWS would be of significant strategic importance, impacting regional and global security considerations. It is, therefore, imperative to examine the implications of Research and Development (R&D) and their prospective deployment and utilisation in the two nuclear-armed nations in South Asia, specifically India and Pakistan.

India's Position

India is working to advance the development of autonomous weapons systems while advocating for establishing comprehensive international rules about such technologies. Indians provide many rationales for the establishment and advancement of legal frameworks.[38] The prevailing argument often posits that autonomous weapons have the potential to assist the military establishment in various domains, such as border control and safeguarding vulnerable assets, owing to the security problem in South Asia and India's security requirements. According to their perspective, there is now no necessity for a ban on AWS, primarily LAWS, due to their incomplete operational functionality.[39] Instead, it is recommended that India actively engage in diplomatic efforts and advocate for advancing, transferring, and utilising such weaponry. According to proponents of this technology, India must acquire a proportionate allocation of this technological advancement to position itself alongside future global powers. However, proponents from India also express their concerns regarding the potential proliferation of automated technologies to non-state actors. Nevertheless, the nation will probably prioritise the advancement of this technology before the establishment of

international regulations. In the paper titled 'India and the Challenge of Autonomous Weapons', authored by Shashank Reddy, it is argued that introducing autonomous weapons will have a profound impact on the concept of warfare and will also affect the understanding and application of IHL. According to it, India aims to assume a prominent role in the global dialogue surrounding this matter while simultaneously pursuing the deployment of autonomous weapons in alignment with its security requirements and national objectives. Indian authorities assert that New Delhi must seize the opportunity and actively pursue the advancement and implementation of autonomous weapons technology.[40] Consequently, the Indian government's efforts to implement AWS will likely pressure neighbouring governments to adopt similar policies.

Pakistan's Position

Pakistan's position towards developing AWS is unambiguous and direct. The argument not only advocates for a comprehensive prohibition on autonomous technology but also asserts that unethical laws cannot be programmed to adhere to IHL, regardless of their level of complexity. [41] It has been argued that implementing AWS will reduce the threshold for engaging in armed conflict, consequently leading to a void in accountability. Utilising such weapons systems would undermine the adherence to international legal norms, compromising the security and protection of non-combatants.

> *"Pakistan has argued for a legally restricting CCW convention that preemptively bans the advancement and utilisation of such weapons."*[42]

Pakistan supports the prohibition of autonomous weapons because it believes they present significant problems to IHL. Pakistan is the first to advocate for a prohibition on AWS and is the most fervent advocate for a proactive ban, as seen by its active involvement in the conclusion of the Convention on Certain Conventional Weapons

(CCW). Pakistan is the inaugural Non-Aligned Movement (NAM) member to assume the role of president at the CCW Review Conference (RevCon).

Pakistan also expresses ethical concerns regarding autonomous weapons, aligning with its commitment to international humanitarian norms. These concerns involve potential violations of principles such as proportionality and distinction, underscoring the country's emphasis on maintaining ethical standards in developing and deploying such technologies. As a signatory to IHL agreements, Pakistan considers the legal implications of autonomous weapons, advocating for adherence to existing frameworks that govern principles like distinction, proportionality, and accountability. Strategic considerations encompass the evaluation of the impact of autonomous weapons on regional stability, focusing on preventing conflicts or disruptions to existing strategic balances. Pakistan endorses the principle of human control over critical decisions in using force, supporting safeguards against unintended consequences. Recognising that national positions on emerging technologies evolve based on security concerns, technological capabilities, and regional dynamics is crucial.

Ambassador Tehmina Janjua, the representative of Pakistan in disarmament matters, chaired the Fifth Review Conference of the CCW in December 2016, during which participating governments expressed their endorsement of the prohibition.[43] Ambassador Zaman Mehdi, Deputy Permanent Representative of Pakistan, at the meeting of the Group of Governmental Experts (GGE) on LAWS, 2023, discussed the technical, legal, and ethical dimensions of these weapon systems and the lack of legally-binding rules, principles, and norms despite a decade of deliberations. Pakistan highlighted concerns over the compatibility of autonomous systems with existing international law and norms and the potential humanitarian consequences of failing to develop a meaningful normative framework.[44]

Pakistan regards AWS as a highly potent armament due to its potential for future autonomous capabilities. The government asserts that in warfare, AWS could be considered highly unethical due to its potential to be the most brutal weaponry. Therefore, it is imperative to establish a clear definition to uphold the requirements of International Human Rights Law (IHRL) and ensure that judgments made during times of war are based on human judgment.

Implications for Pakistan's Deterrence Perspective

The concept of deterrence has frequently reduced instability, turmoil, conflicts, or wars. Therefore, the rationale for states acquiring or developing weapons is often justified as fostering peace and security.[45] Nevertheless, the advancement of technology has led to an escalation in the destructive capabilities of weapons, leading to enduring and irreparable humanitarian impacts. The global community has not succeeded in implementing a comprehensive prohibition on these lethal armaments, thereby prioritising the advancement of individual nations' objectives over the preservation of worldwide peace and security. AWS exemplifies this circumstance.

India's development of AWS has significant implications for Pakistan's security. If India proceeds with these advanced emerging technologies, the power dynamics in the region could change. Pakistan may need to rethink its military capabilities and strategies to balance things. There is also a worry that using autonomous weapons might lead to accidental conflicts or make things more tense between India and Pakistan. To deal with this, Pakistan might have to invest more in technology and be more active in international discussions to make sure these weapons are used responsibly. Therefore, an inquiry arises about whether implementing AWS would enhance or undermine Pakistan's security in the South Asian region.[46] What are the ethical, legal, technological, security, and economic ramifications associated with the potential use of this technology? What strategies

can Pakistan, a nation in the development process, employ to address the evolving circumstances effectively?

Options for Pakistan

The precise manner in which India will employ AWS remains uncertain. Pakistan , therefore, has a legitimate claim in seeking comprehensive discussions regarding its utilisation and position within IHL.[47] However, many of these technological breakthroughs currently exist and are likely to be employed in future military conflicts, regardless of whether human intervention is involved. Hence, the Government of Pakistan must stay updated on contemporary advancements in AWS technologies. In this context, the efficacy of AWS in tasks such as target acquisition, monitoring, and evaluation of destruction will remain unaltered.[48] Implementing automation in these roles will yield substantial benefits, including enhanced security and military dominance to a particular entity. This may also include implementing automation in military systems to encompass improved operational efficiency, rapid decision-making capabilities, and reduced human risk in high-stakes scenarios, making it imperative for countries such as Pakistan to engage actively in research and development about autonomous systems. The efficacy of AWS in alternative roles, including reconnaissance and damage assessment, will remain unchanged. These systems can continue to play crucial roles in intelligence gathering, surveillance, and assessing the impact of military actions. Implementing mechanisation in these capabilities will provide a significant advantage to a nation. Therefore, countries such as Pakistan can actively pursue the integration of autonomous systems through technological advancements.[49]

Considering Pakistan 's defense policy and its distinct security position in the region, the country should maintain flexibility in its approach toward developing such weapons, given the seeming inevitability of the integration of AWS in the military strategies of prominent global actors. The development of AWS technology,

especially, has introduced a range of potential factors that can impact global events and foreign policy decisions. The spread of AWS involves both state and non-state actors. Its proliferation raises concern because these disruptive technologies could be used in ways that might not follow international rules. The world community is inclined to continue advancing the development of AWS due to its perceived capacity for error avoidance in conflict situations unless the United Nations (UN) undertakes decisive measures to address this matter. In this particular context, Pakistan should adopt a pragmatic approach when selecting alliances or affiliations.

The advent of AWS may also likely influence national security perceptions. Additionally, international human rights organisations may exhibit a greater inclination towards advocating for the development of AWS for humanitarian causes, regardless of Pakistan 's involvement in this technological race. Furthermore, given the potential for integrating AWS with underwater and surface ships, Unmanned Ground Vehicles (UGVs), drones , and cyber technologies, it is imperative for Pakistan to monitor this emerging battlefield closely.

Under these circumstances, Pakistan can go for the following options in response to India 's autonomous weapon system proliferations:

Technological Development and Countermeasures

Pakistan has the potential to achieve technical self-reliance through substantial investments in Research and Development (R&D) aimed at the development of autonomous weapons systems. This would allow Pakistan to achieve technological equivalence with India and maybe foster the development of inventive capacities. Pakistan can potentially reduce the impact of India's autonomous weapon systems by implementing countermeasures such as advanced cyber defences and anti-autonomous system technology. Potential countermeasures may be implemented to impede communication networks, render targeting systems inoperable, or effectively

neutralise the operational capabilities of autonomous platforms employed by adversaries. Nevertheless, pursuing this alternative necessitates substantial financial resources, a resilient technology infrastructure, and proficient personnel.

Diplomatic Initiatives and Arms Control

Pakistan could address concerns about autonomous armed systems through bilateral talks with neighbouring countries, participation in regional forums like SAARC, engagement with international organisations such as the UN, and advocating for arms control treaties. One potential approach to address this issue is actively participating in international forums to advocate for establishing agreements or rules that govern the deployment and utilisation of these systems.[50] The potential mitigation of an uncontrolled arms race in South Asia might be achieved by the collaborative efforts of many states in formulating and endorsing agreements that impose restrictions on the extent and functionalities of autonomous weapon systems. Confidence-building measures (CBMs) could be relevant in addressing concerns about autonomous armed systems by fostering transparency, communication, and trust among nations. These measures aim to prevent misunderstandings and enhance cooperation. For instance, in the realm of autonomous weapons, CBMs could include sharing information about the development and deployment of such systems, engaging in joint research initiatives, and establishing communication channels to exchange views on policy intentions.

Technological Collaborations

To counter India's advancements in developing autonomous missile systems, Pakistan could explore the option of forming strategic alliances or collaborations with technologically advanced nations. Collaborative research and joint development activities can grant Pakistan access to state-of-the-art technology, thereby equalising the

technical landscape.[51] This alternative presents technological advantages and enhances diplomatic relations and regional collaboration. Nevertheless, managing intricate geopolitical factors and exchanging delicate technologies may be subject to certain constraints and limitations.

Conventional Military Enhancement

Pakistan may also prioritise investments in strengthening its conventional military capabilities in response to India's introduction of autonomous weapon systems. By enhancing traditional military strengths, such as manpower, equipment, and strategic infrastructure, Pakistan may aim to maintain a credible deterrent against potential threats posed by India's adoption of advanced autonomous technologies.[52] Pakistan's strategic objective is to maintain a wide range of capabilities by reinforcing conventional forces, thereby establishing an alternative method of addressing potential threats. This strategic approach entails enhancing the capabilities of infantry, armour, and air defense, which have historically been crucial in maintaining regional stability. The emphasis on traditional military capabilities highlights a dedication to a holistic approach to defence strategy, potentially dissuading India from exclusively depending on autonomous systems for aggressive actions.

Investment in Cybersecurity

The imperative of allocating resources towards cybersecurity is of utmost importance, considering the significant dependence on autonomous weapons systems within digital networks. Pakistan should prioritise protecting its communication infrastructure, command and control systems, and military networks against potential cyber threats.[53] Pakistan's objective in reinforcing these systems is to deter attackers from penetrating or manipulating its autonomous platforms. This strategy requires the development of a robust cybersecurity workforce, the utilisation of sophisticated

encryption techniques, and the implementation of proactive monitoring mechanisms to identify and address cyber threats promptly.

Development of Ethical and Legal Frameworks

Pakistan has the potential to adopt a conscientious strategy by implementing internal ethical and regulatory frameworks to govern the development and utilisation of autonomous armed systems. Pakistan's commitment to ensuring its autonomous platforms operate within international laws and conventions is underscored by strict adherence to rigorous ethical guidelines. This involves implementing robust programming protocols that align with established norms governing the use of autonomous systems. The ethical guidelines encompass principles of proportionality, distinction, and adherence to IHL. By embedding these principles into the programming of autonomous platforms, Pakistan may guarantee that these systems operate with a strong ethical framework, minimising the risk of unintended consequences or violations of international laws during their deployment. This approach reflects a responsible stance, emphasising the importance of ethical considerations in developing and using autonomous technologies within the broader global legal framework. Nevertheless, the strategy above necessitates a thorough investigation into ethical considerations, technological audits, and the establishment of stringent compliance processes.

Investment in Human Capital

In order to adequately address the problems presented by India 's autonomous weapon systems, Pakistan may consider allocating resources to cultivate a highly competent workforce adept in emerging technologies. The development of proficiency in domains such as artificial intelligence, robotics, and cybernetics empowers Pakistan to comprehend and mitigate adversarial systems while leveraging these technologies to gain a strategic advantage. Pakistan

ensures its ability to respond effectively to the swiftly changing technological landscape by cultivating an atmosphere that promotes innovation and technical proficiency.

Ultimately, Pakistan 's choice among these options will be influenced by various factors, including technological capacity, economic considerations, strategic priorities, and evolving regional security dynamics. Each option entails a distinct set of advantages and challenges, making it imperative for Pakistan's policymakers to carefully assess and tailor their response to the specific context of India 's autonomous weapon system proliferation.

Conclusion

In conclusion, AWS and its impact on the changing security dynamics of South Asia unveil that the strategic landscape of South Asia is undergoing significant transformation. As AWS proliferates, it introduces a new dimension to military technology, reshaping regional nations' strategic interactions and considerations.

India's Autonomous Weapons System reveals a dual role, contributing to strategic stability through deterrence while introducing complexities that may reshape risk assessments and potentially alter regional dynamics. This underscores the delicate equilibrium that must be maintained in sustaining peace in South Asia. These technologies, featuring advanced attributes like autonomous decision-making, enhance India's military capabilities. On the one hand, they contribute to strategic stability by deterring major conflicts through their precision and speed. However, beneath this stability, there is a complex interaction of instability. The qualities that make these systems attractive can encourage smaller-scale confrontations due to the impression of limited escalation risk. This dilemma has pronounced implications for Pakistan, as it alters risk assessment, potentially incentivising strategic risk-taking.

The examination of the stances and policies of key South Asian actors toward the deployment of AWS further emphasises the intricate

nature of this evolving security paradigm. As these systems redefine the nature of warfare and strategic stability, it becomes imperative for policymakers and scholars to grapple with the nuanced challenges and opportunities that arise at the intersection of emerging technologies and evolving security doctrines in South Asia.

Moreover, deploying autonomous technologies can transform the nature of disputes, potentially reducing the perception of full-scale armed confrontations but introducing the risk of unintentional escalation. Competition for technological supremacy may also divert resources and contribute to regional rivalry, adding to instability. Pakistan faces the challenge of devising a balanced deterrent policy in this evolving landscape, requiring a deep understanding of changing dynamics and a steadfast commitment to regional peace. The actions of both India and Pakistan significantly influence the future security landscape in South Asia. As AWS continues to influence the security landscape, a comprehensive understanding of its implications is vital for the region's informed policymaking and strategic planning.

Following are some recommendations that can be taken into account for creating balance against India's proliferation of AWS:

- Create a dedicated institution focused on advancing autonomous weapon systems (AWS) technologies. This centre should prioritise innovation in AWS and facilitate collaboration between military and civilian research entities.
- Invest in advanced cyber defense infrastructure to protect against potential cyber threats targeting Pakistan's AWS. This includes training a skilled cybersecurity workforce and implementing sophisticated encryption and monitoring systems.
- Actively participate in international and regional forums to advocate for arms control treaties that regulate the deployment and use of AWS. Promote transparency and cooperation through confidence-building measures.

- Pursue strategic partnerships with technologically advanced nations to access cutting-edge AWS technologies. These alliances should focus on collaborative research and development projects.
- Invest in enhancing traditional military capabilities, including manpower, equipment, and strategic infrastructure, to maintain a credible deterrent against potential AWS threats. This approach ensures a balanced defence strategy.
- Allocate resources to develop a highly skilled workforce proficient in emerging technologies such as artificial intelligence, robotics, and cybernetics. Promote educational programs and training initiatives to foster innovation and technical expertise.
- Establish a dedicated unit to monitor and analyse advancements in AWS technologies within the region. This unit should provide strategic insights and policy recommendations based on evolving security dynamics.

Notes and References

[1] Ingvild Bode and Hendrik Huelss, "Autonomous weapons systems and changing norms in international relations," *Review of International Studies* 44, no. 3 (2018): 393-413.

[2] "Press Release – Seminar on Lethal Autonomous Weapon Systems (LAWS): A Regional Perspective," *Institute of Stategic Studies Islamabad*, 9 May 2023, https://issi.org.pk/press-release-seminar-on-lethal-autonomous-weapon-systems-laws-a-regional-perspective/.

[3] Lucien Crowder, "Why 'Stupid' Machines Matter: Autonomous Weapons and Shifting Norms," *Bulletin of the Atomic Scientists*, 12 October 2017, https://thebulletin.org/2017/10/why-stupid-machines-matter-autonomous-weapons-and-shifting-norms/.

[4] "Make In India," https://www.makeinindia.com/about.

[5] "Infosys Secures $2 Billion AI Deal, Propelling Automation's Future," https://indiacsr.in/infosys-secures-2-billion-ai-deal-propelling-automations-future/.

[6] "Robotic Soldiers Working in Groups to Be Reality by 2023: DRDO Chief," *The Indian Express*, 7 July 2013, https://indianexpress.com/article/technology/technology-others/robotic-soldiers-working-in-groups-to-be-reality-by-2023-drdo-chief/.

[7] "IC - US," *India Defense Technology and Trade Initiative*, https://www.acq.osd.mil/ic/dtti.html.

[8] "India-United States Joint Statement on the Visit of Secretary of Defense Carter to India, December 8, 2016," *U.S. Embassy & Consulates in India*, 8 December 2016, https://in.usembassy.gov/india-united-states-joint-statement-visit-secretary-defense-carter-india-december-8-2016/.

[9] Jürgen Altmann and Frank Sauer, "Autonomous Weapon Systems and Strategic Stability," *Survival* 59, no. 5 (2017): 117–42.

[10] Summar Iqbal Babar and Abu Hurrairah Abbasi, "Emerging Technologies and the Threat to South Asian Security," *CISS Insight Journal* 11, no. 2 (2023): 40-59.

[11] Steven A. Walton, "Technological Determinism(s) and the Study of War," *Vulcan* 7, no. 1 (December 5, 2019): 4–18, https://doi.org/10.1163/22134603-00701003.

[12] Fiona S. Cunningham, "Strategic Substitution: China's Search for Coercive Leverage in the Information Age," *International Security* 47, no. 1 (1 July 2022): 46–92, https://doi.org/10.1162/isec_a_00438.

[13] Summar Iqbal Babar and Muhammad Nadeem Mirza, "Indian Strategic Doctrinal Transformation: Trends and Trajectory," *Journal of Security and Strategic Analyses* 6, no. 2 (2021).

[14] Summar Iqbal Babar, "India's Military Modernization: Implications for Pakistan.," *Pakistan Journal of History & Culture* 41, no. 1 (2020).

[15] Putu Shangrina Pramudia, "China's Strategic Ambiguity on the Issue of Autonomous Weapons Systems," *Global: Jurnal Politik Internasional* 24, no. 1 (2022): 1-34.

[16] Franz-Stefan Gady, "New US Defense Budget: $18 Billion for Third Offset Strategy," https://thediplomat.com/2016/02/new-us-defense-budget-18-billion-for-third-offset-strategy/.

[17] "India Already Facing Trailers of Future Wars: Army Chief," *The Shillong Times*, 3 February 2022, https://theshillongtimes.com/2022/02/03/india-already-facing-trailers-of-future-wars-army-chief/.

[18] Abhishek Bhalla, "Drones Future of Warfare to Take on Tanks and Artillery: Indian Army Chief," *India Today*, 11 February 2021, https://www.indiatoday.in/india/story/drones-future-of-warfare-to-take-on-tanks-and-artillery-indian-army-chief-1768343-2021-02-11.

[19] Anit Mukherjee, Rajeswari Pillai Rajagopalan, and Nishant Rajeev, "Momentous Changes: Defence Reforms, Military Transformation, and India's New Strategic Posture," *Observer Research Foundation*, 18 July 2023, https://www.orfonline.org/research/momentous-changes-defence-reforms-military-transformation-and-india-s-new-strategic-posture.

[20] "Pros and Cons of Autonomous Weapons Systems," *Army University Press*, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2017/Pros-and-Cons-of-Autonomous-Weapons-Systems/.

[21] Muhammad Sadiq and Iftikhar Ali, "Challenges of nuclear deterrence stability in South Asia." *Journal of Asian and African Studies* (2022): 00219096221090636.

[22] Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (Oxford University Press, 2022).

[23] Qi Haotian, "'Smart'warfare and China–US stability: strengths, myths, and risks," *China International Strategy Review* 3, no. 2 (2021): 278-299.

[24] Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security* 41, no. 4 (2017): 9–49.

[25] James Johnson, "AI, Autonomy, and the Risk of Nuclear War." (2022).

[26] M Shamsul Haque, "Governance, Security, and the Environment in South Asia: A Paradox of Change and Continuity," *Asian Economic and Political Issues* 8 (2003): 115.

[27] Michael Krepon, "The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia ," *Prospects for Peace in South Asia* 1 (2003): 261–79.

[28] Abhinandan Mishra, "Indian Army Gets Future Ready with AI-Based Equipment," *The Sunday Guardian Live*, 16 July 2022, https://sundayguardianlive.com/news/indian-army-gets-future-ready-ai-based-equipment.

[29] "Army to Get Self-Reliant, Autonomous Robots Soon," *The Times of India*, 4 March 2017, https://timesofindia.indiatimes.com/india/army-to-get-self-reliant-autonomous-robots-soon/articleshow/57465221.cms.

[30] Shashi Shekhar Vempati, *India and the Artificial Intelligence Revolution*, vol. 1 (2016).

[31] Vivek Raghuvanshi, "India Finalizes $3B Blueprint for UAV Fleets," *C4ISRNet*, 22 March 2016, https://www.c4isrnet.com/unmanned/uas/2016/03/22/india-finalizes-3b-blueprint-for-uav-fleets/.

[32] Snehesh Alex Philip, "Army Orders over 100 Indo-Israeli Kamikaze Drones amid Active LAC and Precarious LoC," *The Print*, 3 September 2021, https://theprint.in/defence/army-orders-over-100-indo-israeli-kamikaze-drones-amid-active-lac-and-precarious-loc/727508/.

[33] "Eye on China and Pakistan, Army Set to Buy Armed-Drone Swarms," *The Times of India*, 29 September 2022,

https://timesofindia.indiatimes.com/india/eye-on-china-and-pakistan-army-set-to-buy-armed-drone-swarms/articleshow/94522387.cms.

[34] "Army Eyes Light Tanks & Armed Swarm Drones for Mountain Warfare on China Front," *The Times of India*, 27 August 2022, https://timesofindia.indiatimes.com/india/army-eyes-light-tanks-armed-swarm-drones-for-mountain-warfare-on-china-front/articleshow/93810458.cms.

[35] Ladwig III, Walter C. "Indian military modernization and conventional deterrence in South Asia," *Journal of Strategic Studies* 38, no. 5 (2015): 729-772.

[36] Zulfiqar Khan, "The Changing Dynamics of India-Pakistan Deterrence." *Pakistan Horizon* 66, no. 4 (2013): 1–19. http://www.jstor.org/stable/24711512.

[37] Adil Sultan, "South Asia's emerging military postures and challenges for regional stability," *Nuclear Politics in Asia*, (2017),181-198.

[38] R. Shashank Reddy, *India and the Challenge of Autonomous Weapons* (2016).

[39] Ibid.

[40] "C Raja Mohan, "India, 'Killer Robots' and the China Challenge," *The Indian Express*, 14 November 2023, https://indianexpress.com/article/opinion/columns/c-raja-mohan-writes-india-killer-robots-and-the-china-challenge-9026293/.

[41] Ibid.

[42] "Convention on Certain Conventional Weapons - Informal Meeting of Experts (2016)," *United Nations Office for Disarmament Affairs*, 15 April 2016, https://meetings.unoda.org/ccw-ime/convention-certain-conventional-weapons-informal-meeting-experts-2016.

[43] "Statements from the Fifth CCW Review Conference," Reaching Critical Will, 12 December 2016, https://www.reachingcriticalwill.org/disarmament-fora/ccw/2016/revcon/ statements.

[44] "Remarks by Ambassador Zaman Mehdi, Deputy Permanent Representative of Pakistan at the Meeting of Group of Governmental Experts (GGE) on Lethal Autonomous Weapons Systems (LAWS)," 6 March 2023, https://docs-library.unoda.org/

Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2023)/Statement_of_Pakistan_at_GGE_(06_March_2023).pdf.

45 Vipin Narang and Scott D. Sagan, *The Fragile Balance of Terror: Deterrence in the New Nuclear Age* (Cornell University Press, 2023).

46 Michael C. Horowitz, "When Speed Kills: Lethal Autonomous Weapon Systems, Deterrence and Stability," in *Emerging Technologies and International Stability* (Routledge, 2021), 144–68.

47 Qerim Qerimi, "Controlling Lethal Autonomous Weapons Systems: A Typology of the Position of States," *Computer Law & Security Review* 50 (2023): 105854.

48 Stephanie Mae Pedron and Jose de Arimateia da Cruz, "The Future of Wars: Artificial Intelligence (AI) and Lethal Autonomous Weapon Systems (Laws)," *International Journal of Security Studies* 2, no. 1 (2020): 2.

49 Toluwabori Magbagbeola, "Assessing and Managing the Risk of Lethal Autonomous Weapons Systems," 2021.

50 Younis Ahmad Sheikh, "The Confidence Building Measures (CBMs) Between India and Pakistan ," *Journal of Islamic World and Politics* 7, no. 1 (2023): 109–18.

51 Sadia Rafique and Saira Masood, "Indian Naval Expansion and Its Strategic Partnership with US in the Indian Ocean Region: Implications for Pakistan ," *Journal of Professional Research in Social Sciences* 9, no. 2 (2022): 29–41.

52 MICHAEL LIMA, "Strategic Competition and Self-Reliance: Analyzing Munitions Industrial Bases in India and Pakistan amid Great-Power Rivalry.," *Journal of Indo-Pacific Affairs* 6, no. 5 (2023).

53 Muhammad Ibrar et al., "Tackling Pakistan 's Cyber Security Challenges: A Comprehensive Approach," *International Journal of Network Security* 25, no. 3 (2023): 529–36.