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CENTRE for AEROSPACE & SECURITY STUDIES

The logo for GSTAR 2022, with 'GSTAR' in a large, bold, black font and '2022' in a smaller font to the right. A stylized blue and white graphic element is integrated into the 'A'.

GLOBAL STRATEGIC THREAT & RESPONSE

Evolving Global Order: Challenges and Opportunities

Report

19-20 | October
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CENTRE for AEROSPACE & SECURITY STUDIES

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**Evolving Global Order:
Challenges and Opportunities**
Report

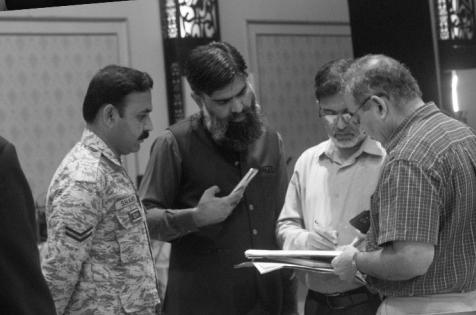


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What is GSTAR?

Momentous developments are taking place across all domains which are deeply affecting the global, regional, and national security environment. These include accelerating United States-China rivalry, growing Sino-India tensions, deepening US-India strategic partnership, joint strategies concerning South Asia and the Indo-Pacific region and the resultant polarisation. AUKUS, the emerging alliance between Australia, United Kingdom and the US aimed at containing China will not only intensify US-China rivalry but will also negatively impact the nuclear non-proliferation regime. Additionally, continued instability in Afghanistan and uncertain situation in the Middle East makes Pakistan's balancing act with all these countries far more challenging and precarious. All these trends and developments represent a complex interplay of geoeconomics and geopolitics, with far-reaching global, regional, and national consequences. Moreover, developments in the field of aerospace and air power, rapidly emerging technologies and their diverse military applications are making the international and regional security landscape far more complex, volatile, and delicate. This necessitates an intellectual initiative at the global level to comprehensively map and review such developments, analyse their implications, and explore viable policy options to mutually chart a way forward to help build a more stable world and regional order.

Vision

GSTAR is an international policy engagement forum for exploring pressing challenges, emerging from the global strategic environment and technological developments affecting national security and providing inputs on future counterstrategies, especially in the aerospace sector.

Objectives

The biennial 'Global Strategic Threat and Response' (GSTAR) is a unique international forum, initiated by CASS, to:

- Review the most significant global strategic trends and challenges by bringing together national leadership, reputable international and Pakistani experts from think tanks, academia, defence services, intellectuals, and Original Equipment Manufacturers (OEMs).
- Give an opportunity to Pakistan's policy leadership to share the country's strategic vision.
- Voice national security concerns related to global and regional trends with an international audience.
- Contribute towards building a safer world, with support of the global community.

Overarching Theme of GSTAR 2022

International Security Environment: Emerging Challenges and Opportunities

With the rise of emergent and resurgent powers, the world is gradually moving away from a unipolar to a multipolar world order, leading to the formation of new alliances and power blocs. Despite growing international concerns about social and environmental issues, the world continues to be dominated by militarily strong and technologically advanced nations, with little or no concern for collectively shaping a global system based on international norms and rule of law.

The formation of new alliances to contain rising powers has led to a major power struggle and creation of complex dynamics, which have changed the nature and level of global and regional threats. Owing to its unique geostrategic location, South Asia has once again become pivotal to this global and regional power struggle. The evolving geostrategic dynamics necessitate well-considered, timely and innovative policy options.

US-China economic competition has transformed to a rivalry between the two. The Belt and Road Initiative (BRI), China's trade connectivity plan with the China-Pakistan Economic Corridor (CPEC) as its flagship project though aimed at economic development is also viewed by Western powers with suspicion, which creates challenges for South, West and Central Asian regions and Pakistan.

In addition to geopolitics, economics is also playing a major role in reshaping alliances and power blocs. Therefore, the Quadrilateral Security Dialogue (QUAD) formed to contain China, could eventually lead to the formation of a treaty partnership like Asian NATO. The rapid and large-scale militarisation and massive deployment of strategic and conventional weapon systems in the Asia-Pacific, and provision of nuclear submarines to a non-nuclear state, has created new challenges for the delicate balance of power in this region and weakened the non-proliferation regime. Moreover, the recent uncertain developments in Afghanistan, expanding Indo-US strategic partnership, tense US-Iran relations and continuously increasing US-China rivalry affect the entire region in general and Pakistan's foreign, security and economic policies in particular.

Emerging technological developments, with tremendous growth potential as well as military applications, have added yet another dimension to the ongoing great power struggle. Many nations are working individually as well as jointly to achieve excellence and domination through technical / technological prowess, both in the economic and military domains. While export control regimes monopolise sharing of technologies relevant to military applications, the need for a fair, transparent, and equitable international legal framework is essential for ensuring their non-discriminatory access and use as well as avoidance of monopolies and military asymmetries. More importantly, their kinetic and non-kinetic applications have forced states to rethink future doctrines, strategies, and warfare.

Aerospace power, being technology intensive, is the most affected and must adapt along with these developments to remain the most efficient, agile, and leading arm of the military. This, however, necessitates a more dynamic and capable human resource, supported by comprehensive and advanced training regimens, to optimally understand, master and employ these technological innovations for aerospace power application against diverse kinetic and non-kinetic threats.

This year's GSTAR was spread over two days and four Working Sessions, in addition to the Inaugural and Closing plenaries under the core theme 'Evolving Global Order: Challenges and Opportunities' discussed by reputed international and Pakistani experts from think tanks, academia, defence services, intellectuals and Original Equipment Manufacturers. The four Working Sessions included the following themes:

Working Session I:

International Security Environment: Emerging Challenges and Opportunities

Working Session II:

Geo-economics: Driver of the Asian Century

Working Session III:

Emerging Technologies & Future Warfare

Working Session IV:

Aerospace Security: Determinants and Future Prospects

International Security Environment: Emerging Challenges and Opportunities

The return of great power competition in global politics is posing enormous challenges for the entire world. Momentous developments in International Relations including the US- China rivalry, an assertive Russia challenging the Western-led global economic and political order and its military operations in Ukraine are having far-reaching implications for countries around the world. These developments have led to the formation of alliances likely to exacerbate tensions with potential to disturb strategic stability.

Working Session I

The great power rivalry and competition and the unprecedented challenges it poses for global economic, political, and strategic stability underscore imperatives to find ways to avoid military confrontation and peacefully manage global competition between the US, China and Russia and regional rivalries involving India, Pakistan, Iran, the Middle East and North Korea. This session tried to find mechanisms for avoidance of military confrontation through communication, Confidence Building Measures, and conflict prevention methods to bolster strategic, political and economic stability.

Geoeconomics: Driver of the Asian Century

The conventional wisdom of the 21st Century as being a decidedly 'Asian Century' corresponds with various tectonic shifts in the geoeconomics of the Asia-Pacific region. These shifts portend an increasing concentration of economic development and dynamism in Asia but are accompanied by strategic-level recalibrations of the world's major geoeconomic players in ways that are, at times, complementary, but at other times, antagonistic. This GSTAR session looks at three core elements of geoeconomic concern for the Asian Century and what they might mean for Pakistan as well as for the world at large:

1. Impact of great power rivalry in the Asia-Pacific,
2. Geoeconomics of Asia-Pacific's rise, and,
3. How to build peaceful regional connectivity and prosperity.

Working Session II

Looking at these three facets of contemporary geoeconomics, and drawing upon the insights of leading international thinkers, this session made significant contribution to our understanding of the role that geoeconomics will play in the modern geostrategic environment.

Emerging Technologies & Future Warfare

The Fourth Industrial Revolution (4IR) has resulted in unprecedented pace of development in innovative technologies such as Artificial Intelligence (AI), Directed Energy (DE), cyber, space, quantum computing and biotechnologies, among others which affect all facets of modern life such as health, agriculture, education, businesses and also help improve the economies. However, like all other technologies, when used in military applications, they have the potential for unprecedented destruction and devastation. New technologies, in addition to changing the quantum and speed of destruction, will also impact the character and nature of this destruction during war and create response dilemma for political and military leadership, leading to uncertainties. With their kinetic and non-kinetic disruptive capabilities, convergence of these technologies will create serious challenges, necessitating better understanding of their combined effects on nuclear thresholds and strategic stability. Emerging technologies and their speedy acquisition by all states with huge funding has triggered an arms race, undermining stability and increasing the prospects for unintended and potentially uncontrollable escalation. While many existing technologies are not fully covered by existing laws, innovative technologies are developing at a pace faster than nations are working to develop legal frameworks. These technologies can, therefore, upset the existing value system and frameworks upon which the current international social order and norms are dependent.

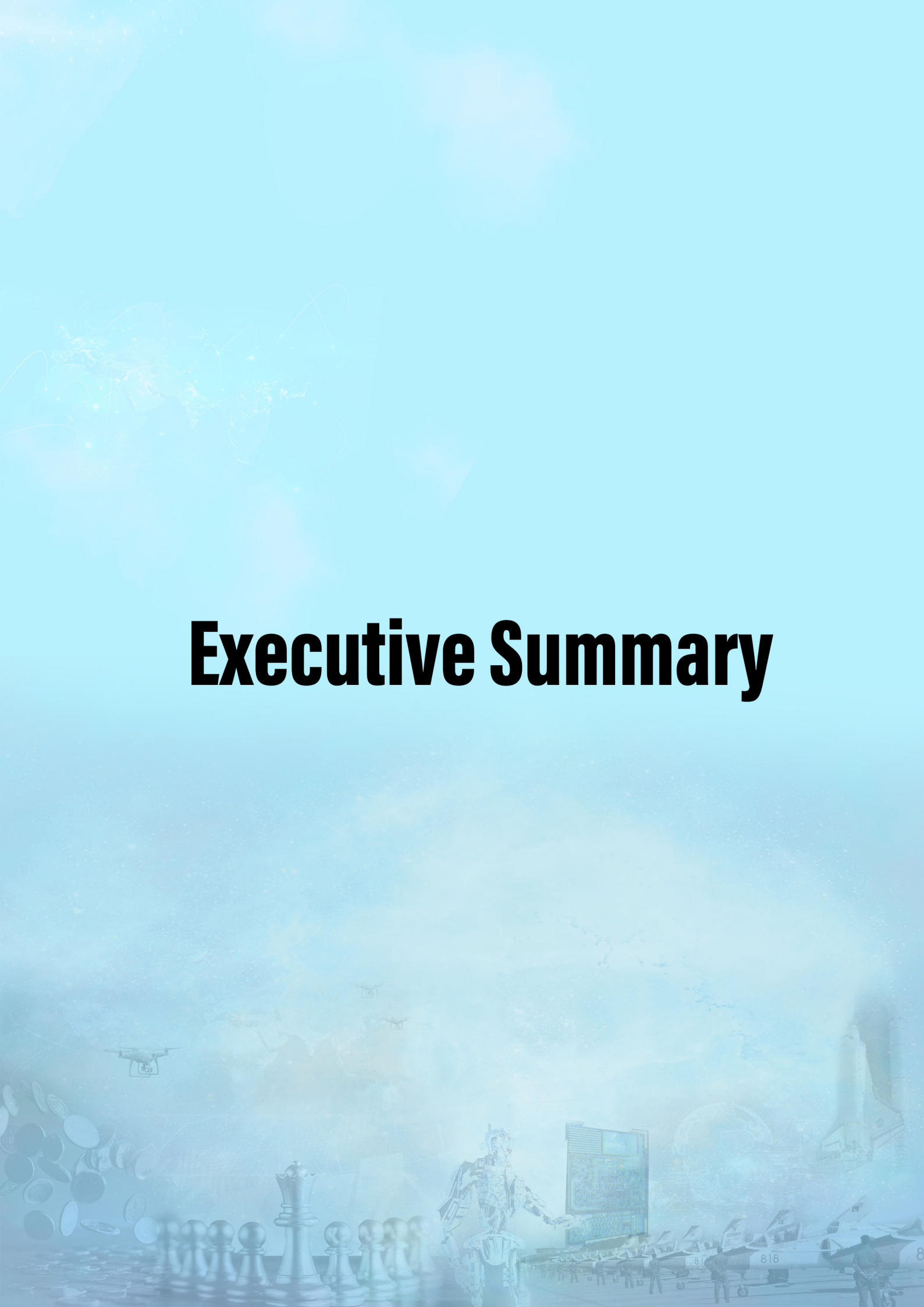


Aerospace Security: Determinants and Future Prospects

In contemporary times, innovative technology applications and doctrines, rather than traditional military hardware and strategies, are shaping the modern-day battlefield. In this technology-driven world, the duration of armed conflict between states is shrinking and the latter are more concerned about achieving their political objectives and strategic effects in a short span of time. Air power attributes of flexibility, ubiquity, accuracy, destructive power, and availability on short notice make it a weapon of first choice. While advancements in space technologies are helpful in fostering scientific progress and economic growth, integration of space-based technological developments such as real-time Intelligence, Surveillance and Reconnaissance (ISR), secure communications, early warning etc. have transformed air power into aerospace power giving tremendous boost to its effectiveness. Aerospace power is, thus, having profound impact in shaping current as well as future warfare doctrines and strategies. This session analysed the impact of emerging technologies in the aerospace domain, specifically national security and challenges faced by technologically developed and developing nations.



Executive Summary



Executive Summary

The two-day Global Strategic Threat and Response (GSTAR) 2022 on ‘Evolving Global Order: Challenges and Opportunities’ was organised by the Centre for Aerospace & Security Studies from 19-20 October 2022 in Islamabad, Pakistan.

Dr Arif Alvi, President Islamic Republic of Pakistan inaugurated the international conference. He congratulated CASS for organising the second edition of GSTAR and commended the Pakistan Air Force for always being at the cutting edge and producing heroes in the history of Pakistan. The Welcome Address was delivered by Chief of the Air Staff, Air Chief Marshal Zaheer Ahmed Baber Sidhu, NI(M), Pakistan Air Force. On this occasion, the Air Chief announced the formal inauguration of the flagship National Aerospace Science and Technology Park (NASTP). The initiative is aimed at establishing technology parks and Aviation Design and Innovation Center (ADIC) in four major cities of Pakistan (Karachi, Lahore, Rawalpindi & Kamra) to give impetus to the process of indigenisation and technology drive as well as promote industry-academia linkages for innovation-led economic growth of the country.

The Concluding Session was presided by Air Marshal Muhammad Zahid Mahmood, HI(M), Vice Chief of the Air Staff, Pakistan Air Force. Air Marshal Farhat Hussain Khan, HI(M), SBt (Retd), President, Centre for Aerospace & Security Studies, Islamabad, Pakistan, delivered the Vote of Thanks.

16 papers were presented at this year’s GSTAR by leading international and national scholars representing seven different countries including Canada, China, Germany, Latvia, Pakistan, United Kingdom, and United States of America. GSTAR 2022 was attended by nearly 500 delegates each day. More than 110 print and electronic media covered the full two-day event.



The first Working Session of GSTAR 2022 was aimed at assessing the ‘International Security Environment: Emerging Challenges & Opportunities.’ Experts from the US, China, and Pakistan were engaged to comprehensively analyse the US Indo-Pacific Strategy, China’s vision for regional peace and security in the evolving geostrategic environment, and the US-China rivalry in the context of options for Pakistan.



The session moderator **Ambassador Jalil Abbas Jilani**, in his opening remarks, said that unprecedented developments had taken place in the regional and global landscape with far-reaching implications for Pakistan, South Asia, and the world. Whether, it was US-China rivalry, an assertive Russia, an uncertain situation in Afghanistan, an aggressive India in South Asia, India-Pakistan tensions, or the formation of new alliances, all these developments had the potential to disturb the existing political, economic, and military balance. Great power rivalry and competition, and the significant challenges they posed for global economic, political, and strategic stability underscored the importance of developing mechanisms to avoid confrontation and live peacefully.



Ambassador Robin L. Raphel highlighted that the Indo-Pacific region was among the most dynamic regions in the world where strategic competition with China would remain a major concern for the US. According to her, US interest in the Indo-Pacific was not new as the region had always been important given its sea trade linkages. She agreed that China was an emerging global economic power and could trigger a change in the global world order; and US’ strategic competition with Beijing required major allocation of diplomatic, strategic, and economic resources. Explaining the US’ new ‘National Security Strategy’, she shared that the US had prioritised competing with China, constraining Russia, as well as grappling with global challenges like climate and pandemics through investments, alliances, and competition. However, she was of the view that the US Indo-Pacific strategy provided an opportunity for stable balance of power in the region that would allow all countries, including China to grow and prosper.



While sharing China's vision for regional peace and security in the evolving geostrategic environment, **Professor Dr Yan Xuetong** said that the world was moving towards a new international order and the 'US' small yard, high fence strategy' would get worse in the coming decades. Talking about the new phenomenon of de-globalisation, Dr Xuetang asserted said that it would negatively affect this new world order as it would create traditional and non-traditional security challenges. In addition to this, he warned that the use of data technology for disinformation campaigns by many states had changed the concept of warfare. Such negative use of data technology could create problems for both developed and developing nations. He was also of the view that the Russia-Ukraine war was not likely to end any time soon and would undermine the security environment not only in Europe but also in Asia.



Ambassador Riaz Muhammad Khan, while talking about the US-China rivalry, stressed that countries would have to adjust with its different dimensions of this rivalry, which would become a constant feature in the new global environment. He was also of the view that the era of globalisation, with its promotion of free trade and flow of knowledge, appeared to be ending. The Ambassador added that the world was inexorably moving towards multipolarity and regionalisation of power rather than its concentration towards a single pole. While discussing options for Pakistan, he stressed that the state could not afford to be part of any bloc or alliance system. In the context of US-China, Pakistan needed to strengthen its strategic and economic cooperation with China while sustaining a mutually beneficial relationship with the US. He urged policymakers to focus on modernising the country's economy, education, and every facet of its national activity like China.



Goeoeconomics has come to occupy a central place in the calculus of nations grappling with a complex and volatile global environment, because of the interdependence of national security and economics. With this in mind, the second Working Session of GSTAR 2022 focused on goeoeconomics, specifically in the context of 'Goeoeconomics: Driver of the Asian Century.' The discussion was driven by the importance of Asia's economic rise during the early 21st Century, and the response of all key states to the increasing value of this region in global dynamics. Five speakers were invited to offer insightful and diverse perspectives on this theme.

The session moderator, **Dr Usman W. Chohan** gave the necessary background to goeoeconomics as a field of study, and pointed to the ideological, institutional and practitioner difficulties of contextualising goeoeconomics which rendered it an orphan subject. He also emphasised the need for a long-term mental orientation to appreciate the necessity of goeoeconomics, and for countries to work together to create and preserve economic value for the world as a whole.





and coercive measures. Countries, he argued, would need to be highly competitive to be successful in such an environment.

The Keynote Speaker, **Dr Moeed W. Yusuf** delineated a concise and persuasive vision of economic security as lying at the core of Pakistan's national security, with geoeconomics being a key driver. He built on a conceptual framework that situated Pakistan's geo-location at the juncture of the three main theatres of contestation in the world and argued for a concerted effort to maximise the country's geoeconomic potential through connectivity and development partnerships. Dr Yusuf cautioned that the world was moving towards 'economic nationalism' marked by increasing restrictions, sanctions



sub-national strategic decentralisation. She added that economic interdependence did not have a deterrent value.

Dr Una Aleksandra Bērziņa-Čerenkova, from Latvia, assessed the value of geoeconomics as a prism of analysis in international strategic evolution, finding that it was a credible approach to inform strategic thinking. She then critiqued the ultimate potency of geoeconomics as a credible deterrent in geostrategic contestation where the stakes become too high for nations. She also elucidated a path for small and middle powers to exert agency and seize opportunities in an environment of stable uncertainty, using multilateralism, ad hoc cooperation, positive interdependence, and



understood in the unique context of postmodernism.

Speaking from Canada, **Dr Karl Moore** framed the broad contours of geoeconomics as informed by historical processes which find echoes in the 21st Century, such as in the sustained importance of China and thus on the need to appreciate Sino-centric worldviews. He further discussed the shifting nature of globalisation as veering towards 'regionalisation,' and the importance of regional connectivity. Dr Moore then pointed towards the traits that characterise younger generations, who would assume leadership positions in geoeconomic platforms during the mid-21st Century, and who therefore, must be



Russian Far East in coming years.

Highlighting the Chinese perspective, **Dr Wang Wen's** emphasis lay in the need for peaceful connectivity, prioritisation of economic prosperity, and the continuity of policy initiatives, which are best practices that one could extract from the 40-year period that had led to East Asia's rise. He prescribed the need for the world at large to synthesise, pay careful attention, and draw lessons from the experience of East Asia, and stressed the need for further cooperation with East Asia since it would serve as a driving force for the sustainable development of South Asia, Central Asia, and the

Emerging technologies such as Artificial Intelligence (AI), Directed Energy (DE), cyber, space, quantum computing and biotechnologies etc. were affecting all facets of modern life and helping to improve the overall economy of countries, according to **Air Marshal M. Ashfaque Arain, HI(M), SBt (Retd)**, while moderating the third Working Session. But when used in military applications, they had the potential for unprecedented destruction and devastation, he cautioned.



Lieutenant General Khalid A. Kidwai, NI, HI(M) (Retd), in the Keynote Address of this session provided a historical overview and opined that all technologies at the time of their conception were 'emerging' technologies, but the term had gained more popularity in recent years. He highlighted how these technologies were leading to profound changes in warfare, including techniques, tactics, doctrines, and strategies. In the past, such technologies had caused strategic instability but they were always countered by new technologies and antidotes, re-establishing strategic stability. Due to this reason, he felt that the current emerging technologies would also have their counters in due course. On the Indian pursuit of emerging technologies, he stressed that apart from targeting strategic stability of South Asia, they could also lead to uncontrollable events if practised with abandon. Despite Western favours and exceptional treatment given to India to contain China, India had repeatedly demonstrated its reluctance to oblige the West when it came to its own national interests. Lieutenant General Kidwai was confident that the challenges posed by emerging technologies would be fully met by Pakistan in the future as witnessed in the past and that the country's national security was sacrosanct and would never be left at the mercy and vagaries of international geopolitical weather and technologically created imbalances.



Discussing various new technologies and their impacts, **Senior Colonel Yang Jun (Retd)** from China, shared that in his view cyber and information technologies appeared to be the most game-changing for future warfare as these were widely being used for military purposes such as information acquisition, data transmission, intelligence support, information services etc. He warned that rapid advancements in AI were likely to increase the operational tempo to an extent that the human brain would not be able to cope with the rapidly changing battlefield, resulting in delegation of most decisions to intelligent machines. The expanding space, field, and dimensions of military activities were necessitating higher requirements for systematic, quantified and engineering-based military theories. In his analysis, future wars would only be won by grasping the laws and characteristics of modern warfare, out-of-the-box thinking and taking into consideration systems, data and algorithms, exploring new operational concepts, designing new winning mechanisms, strengthening the integration



of war-fighting and technological development. In this regard, he noted that absence of international laws and regulations governing cyber warfare were serious challenges.



In his presentation, **Dr George M. Moore** from the US, discussed how the current and future proliferation of drones and Lethal Autonomous Weapon Systems had changed both military and civil security, including the impact of AI and removal of the human element from lethal decision-making. Discussing the case of Russia-Ukraine war, he opined that the potential use of drones, particularly Uncrewed Aerial Vehicles would lower the threshold for conflict since their use in Ukraine had challenged the long-held understanding that they could only operate in lightly or undefended theatres. According to Dr Moore, this would force many militaries to improve defensive and offensive capabilities of drones. Also, a drone's ability to swarm was unique and threatening against conventional military operations. He hoped that the post-Ukraine war scenario may help in bringing focus on regulations over use and proliferation of drones informed by human rights legislations and the issue of discrimination and collateral damage.



Ms Marina Favaro defined emerging technologies as those scientific discoveries and technological applications that had not yet reached maturity or were not widely in use but were anticipated to have major - perhaps disruptive - effect on international peace and security. Her research suggested that in most cases, emerging technologies would have negative influence on international stability and human security. An example of this was the nascent technological arms race picking up between the US, China, and Russia. She cautioned that great power competition would be the main driver behind future research and development in these countries. She concluded that while the China-Russia alliance could confront the US with serious military-technological challenges, arms control may seem more attractive when adversaries narrow the competitive gap.

Opening the final Working Session of GSTAR 2022 on 'Aerospace Security: Determinants and Future Prospects', moderator **Air Commodore Dr Zia Ul Haque Shamsi, SI(M) (Retd)** said that rapid technological advancements had resulted



in integration of air power and space power into aerospace power to support attainment of national objectives. Despite being a relatively new concept, it had become a very important component for ensuring national security and economic development. He added that owing to technology control regimes, developing nations needed to work towards collaborative and indigenous developments to accrue benefits.

Delivering his Keynote Address from New Zealand, **Air Commodore R. Shaun Clarke, ONZM (Retd)** discussed why the spectre of fully autonomous air was well within reach, and why there was little confidence in banning it. According to him, autonomous air was no more paradigm shifting in warfare than the arrival of air power itself, and that was not banned, especially since autonomous air had been around for a long time; could ultimately be more reliable than humans; bring new levels of precision; and be more humane in war with fewer casualties. He was of the view that attempting to ban technology in a war that had such high utility outside war would be novel and achieving consensus to ban the ongoing development of autonomous air, extremely improbable. He predicted that the political consensus necessary for a meaningful ban on autonomous air would be challenging, especially since countries like China, Israel, Russia, South Korea, Australia, UK, US (apart from 90+ others) were already significantly invested in higher order development of autonomous air at some level.



Dr James J. Wirtz opined that when it came to the militarisation of space, the world was at an inflection point. Space-based communication, intelligence, reconnaissance and surveillance systems were figuring prominently in peacetime and wartime military operations. Kinetic and non-kinetic spaced-based weapons were being tested, if not operationally deployed on a day-to-day basis by great powers. In his judgement, hypersonic vehicles promised to open pathways to new types of military operations in space. Nevertheless, he felt that competing militaries had not yet gone 'all in' when it came to the militarisation of space.



In their joint presentation, **Dr Damon Coletta** and **Dr Sannia Abdullah Close** discussed the hybrid character of aerospace power. While Dr Coletta focused on the theoretical aspects and shared that Air Power Theory was travelling a path that was distinct from Space Power Theory and how the Russia-Ukraine war had introduced the new concept of 'air denial', Dr Close focused on South Asia, particularly on Pakistan. In Dr Coletta's view, global powers were apparently moving toward combined arms employments instead of hybrid power applications. Dr Close dilated on the implications of this evolution for Pakistan and its strategy in particular and stressed that in order to keep pace with global technological trends, the country's leadership needed to look beyond the traditional air strategy to air space concepts; improve its space programme; foster strategic relationships with the US and European Union and not just China; and organise Pak-US joint workshops on non-kinetic warfare.





Discussing the role of aerospace power in South Asia's security environment, **Air Commodore Khalid Banuri, SI, SI(M) (Retd)** opined that the world was in a flux politically; and was no longer unipolar nor multipolar, with major powers in conflict as well as cooperation. He agreed that air power now included the use of space for military purposes and regularisation attempts had largely become the arms controllers' coffee club since nothing significant was coming out. While discussing, the Pakistan Air Force's space mission 2047, he remarked that significantly large milestones needed to be traversed.

He also added that lack of balance in the approach of some major powers, particularly the US, was augmenting Indian arrogance and hostility leading to greater instability in South Asia.



In his presentation about the National Aerospace Science and Technology Park (NASTP), **Air Commodore Dr Liaquat Ullah Iqbal, SI(M)** shared that NASTP was an integral project of Aviation City Pakistan, being developed as Pakistan's first Aerospace Cluster. With the complete support of the government and under the patronage of the Pakistan Air Force, NASTP had been envisioned to set up a state-of-the-art Special Technology Zone (STZ) housing high-tech aerospace technologies; design centres; public, private, national and international Aviation Industry; MRO facilities for commercial and military aircraft; aviation logistics; expo centres; and advanced vocational training institutes. Dr Iqbal underscored that NASTP would create a world-class environment for augmenting the potential of excellence driven by innovative minds in the country.



Key Takeaways



Key Takeaways

International Security Environment: Emerging Challenges and Opportunities

- ◆ There are unprecedented global and regional developments taking place, such as the United States-China rivalry, an assertive Russia, an uncertain situation in Afghanistan, an aggressive India in South Asia, India-Pakistan tensions, and the formation of new alliances with the potential to disturb the existing political, economic, and military balance in the regional and global landscape.
- ◆ The Asia-Pacific is one of the most dynamic regions in the world where strategic competition with China would remain a major concern for the United States (US). This competition has impacted not only their bilateral relations but also their ties with third-party states.
- ◆ The US needs to extend and modernise its defence and diplomatic presence in the Asia-Pacific. However, this would require a major allocation of her diplomatic, strategic, and economic resources in the region.
- ◆ From the US perspective, its recently launched 'Indo-Pacific Strategy' refers to competition with China and is premised on the assumption that it would provide an opportunity for stable balance of power in the region, in which regional states would be able to make their own choices.
- ◆ China's economic rise is seen as a challenge in the West in the context that the Chinese economy overtaking the US economy could disrupt the world order.
- ◆ Currently, both the US and China consider each other as the biggest challenge to the current world order.
- ◆ From the Chinese perspective, it is unfair that the US should be the only dominating and leading global power.
- ◆ Competition between the US and China is different from the one between the US and former Soviet Union during the Cold War as it is not driven by ideology, expanding geographical occupation, or regime change, it is rather focused on technological advancements and a new world order.
- ◆ 'De-globalisation' would negatively affect all nation-states as it would create both traditional and non-traditional security concerns. Countries would have to adjust to different dimensions of US-China rivalry which may become a constant feature in the new global environment.
- ◆ The world is no longer a place for domination through occupation rather, it is moving towards multipolarity and regionalisation.

Lessons for Pakistan

- 1 In the evolving global environment, Pakistan must play with a straight bat because it cannot outsmart major powers.
- 2 **While Pakistan desires good relations with the US, these must not be at the cost of its relations with any third country. Any unreasonable demands must be resisted and discussed diplomatically but firmly.**
- 3 Pakistan needs to learn lessons from China and modernise its economy, education system, and every facet of national activity.

Goeconomics: Driver of the Asian Century

- ◆ An ideological gap in economics between the state and the market has prevented economists from thinking clearly about goeconomics.
- ◆ Long-term thinking, required to conceive and effectuate goeconomic plans, is being consistently muddled by a rapid succession of local and global crises.
- ◆ Goeconomics is not a deterrent, a tool exclusive to the neoliberal democratic order, or an instrument of political and systemic change.
- ◆ The small and middle powers can have agency and opportunity in an environment of stable uncertainty through multilateralism, ad hoc cooperation, positive interdependency, and sub-national strategic decentralisation.
- ◆ Globalisation is a historical process.
- ◆ China has historically had consistent importance in the world's goeconomic tapestry, and it will continue to matter in the century ahead.
- ◆ The world is more regional than global today.
- ◆ Leadership of the future will be Generation Z which subscribes to a postmodern worldview, as opposed to a modernist worldview that the Boomers and Gen X had.
- ◆ It is necessary for the world to pay attention to, synthesise, and draw lessons from the experience of East Asia in terms of economic growth, development, and peace.
- ◆ Having deeper cooperation with East Asia has become the new driving force for the sustainable development of South Asia, Central Asia, and the Russian Far East.

Lessons for Pakistan

- ① Economic security is the only way forward to secure Pakistan's strategic interests in the times ahead.
- ② The government should tap its industrialisation potential and seriously explore possibilities of expanding and enhancing its export trade with China.
- ③ **Pakistan needs to find the space to build on its goeconomic connectivity model and move from assistance partnerships to development partnerships to make itself politically relevant.**



Emerging Technologies & Future Warfare

- ◆ Technological developments remain unstoppable and in any given era, were always dynamic, progressive and generated profound effects on the strategic stability-instability paradigm in that particular era, time, place and region. At different times in history, they led to destabilising the then-prevailing strategic stability order, for a while, but only up to such time until a counter-technology or antidote re-established strategic stability.
- ◆ India's weapons and high technology acquisition policies have consistently been based on cover and deception by playing the China card artfully, way beyond its legitimate defensive needs.
- ◆ Cyber and information technologies can be game-changers for future warfare as these are widely used for military purposes like information acquisition, data transmission, intelligence support, information services etc. However, there is absence of international laws and regulations governing cyber warfare.
- ◆ Advancements in AI will increase the operational tempo necessitating delegation of most decisions to intelligent machines, gradually taking humans out of the loop.
- ◆ Low-orbit satellite constellations have great potential in C4I2SR and missile interception, etc.
- ◆ In future warfare, 'IT superiority' will become the core component of military superiority, therefore, wars will only be won by strengthening the integration of warfighting and technological development.
- ◆ In recent years, there has been remarkable progress in terms of technology e.g., miniaturisation, super computers, control units, and communication systems with new ramifications for the defence sector.
- ◆ With their extensive use in surveillance, targeting, directing artillery strikes, and spotting, small drones are likely to receive greater attention in the future.
- ◆ Great power competition will be a main driver behind future Research and Development (R&D) in the US, China and Russia and a nascent technological race is already underway.
- ◆ Significant difficulties stand in the way of arms control, particularly due to the negative environment created by geopolitical competition and alignment of great powers' technological trajectories. Arms control may seem more attractive when adversaries narrow the competitive gap.

Lessons for Pakistan

- 1 Drones' ability to swarm and penetrate defences will bring about changes in operational concepts and may lead to an arms race.
- 2 The efforts to control drone proliferation and addressing the issue of lethal autonomy is likely to be informed by human rights legislations and issues of discrimination, but after the Russia-Ukraine crisis is over.
- 3 **The impact of emerging technologies does not always square exactly with its technical characteristics, but overall, it is expected to be negative.**

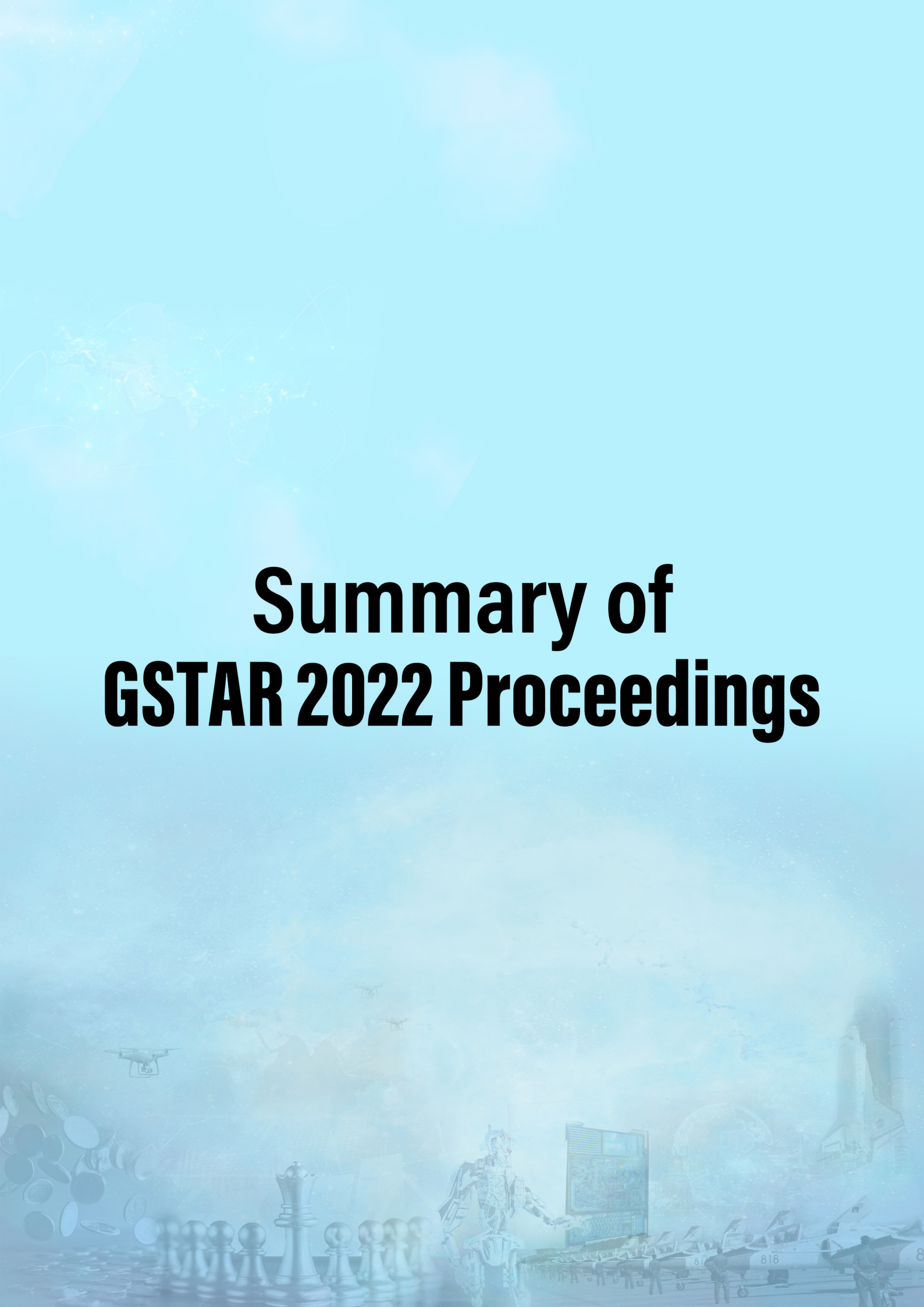
Aerospace Security: Determinants and Future Prospects

- ◆ The mode and tempo of air power employment will continue to transform in line with four 'Ss' of unmanned air power: Size, Speed, Swarms, and Stealth.
- ◆ The immediate future of removing the 'human' from the cockpit, man in the loop and man on the loop, is evolving.
- ◆ The 'Outer Space Treaty', formally the 'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies', bans nuclear weapons in outer space as well as basing weapons on other planets. However, these limitations are relatively insignificant, especially in terms of future development.
- ◆ Militarisation of space is about projecting power in, from, or to space, and the real focus has now shifted to hypersonic weapons.
- ◆ More and more countries now appear to be moving towards combined arms deployments instead of hybrid war application.
- ◆ The four Foundational Agreements for enhanced military/geospatial cooperation between the US and India: General Security of Military Information Agreement (GSOMIA)-2002; Logistics Exchange Memorandum Agreement (LEMOA)-2006; Communications Compatibility and Security Agreement (COMCASA)-2018; and the Basic Exchange and Cooperation Agreement (BECA)-2020, provide the Indian Air Force (IAF) access to secure means of communications used by the US.
- ◆ Frequency of conflict events is likely to increase, especially through Gray Zone Warfare and Hybrid Warfare. Isolated combat events, that may be coercive and aggressive in nature, but deliberately designed to remain below the threshold of conventional military conflict, would grow and continue.
- ◆ There would be an increase in the number of asymmetric warfare events, terrorists and non-state actors would acquire inevitable proliferation of technologies.
- ◆ In all matters of Artificial Intelligence (AI) and its apparent applications, there is a need to make informed, moral judgements about what strategies, permissions and constraints should apply in AI ethics.
- ◆ 'Teaming', through Collaborative Combat Air (CCA), is likely to most characterise the next generation of combat air power.

Lessons for Pakistan

- ❶ **Pakistan has to ensure effective capability to defend against any aggressive designs in South Asia, and in this regard active use of aerospace power is imperative.**
- ❷ The country needs macroeconomic stability as it has a critical infrastructure problem that starts from its space education to training and technology.
- ❸ Pakistan should discuss having joint workshops or joint war games, focusing on non-kinetic warfare, with the US.
- ❹ The government should enable and invest in the country's space sector, encourage private sector investment, and proactively implement its 'Space Vision 2047'.
- ❺ As a 'technology taker', Pakistan should play an important and informed role in the tech space and insist at international forums on the formulation of effective laws and institutional enforcement.

Summary of GSTAR 2022 Proceedings



Inaugural Session

Welcome Address¹

Chief of the Air Staff, Air Chief Marshal Zaheer Ahmed Baber Sidhu, NI(M)
Pakistan Air Force



His Excellency, Dr Arif Alvi, President of Islamic Republic of Pakistan, Former Air Chiefs, Excellencies, Eminent Speakers from across the continents, Distinguished Guests, Ladies and Gentlemen, a very Good Morning.

I feel honoured to address such a distinguished audience at GSTAR 2022. I am extremely grateful to His Excellency, President of the Islamic Republic of Pakistan for gracing this event with his esteemed presence. I also express my deep gratitude to all the respected speakers and distinguished guests for honouring us with their presence today.

Ladies and Gentlemen, contemporary global environment is characterised by omni-domains, strategic competition between major powers which has never been more complex and intense since the end of the Second World War.



¹ Provisional transcript as delivered.



The US-China competition is expanding, deepening, and accelerating. This dangerous trend is weakening the international institutions and reducing diplomacy merely to alliance formation rather than for the pursuit of conflict resolution and peacebuilding. This politics is also being waged in the form of contentious issues of human rights, media freedom, international neglect of critical issues like Kashmir and psychological warfare, etc. Likewise, the increasingly coercive FATF review and strangulating conditions by International Financial Institutions also seems to be influenced by global geopolitics. This raises questions and concern about independence, integrity, and transparency of these international institutions.

These developments have encouraged world and regional players to engage with each other through global, regional and bilateral agreements, for example, AUKUS I & II and QUAD, which are manifestations of the same with implications for the global and regional landscape.

Ladies and Gentlemen, this trend is progressively affecting both traditional and non-traditional security of the entire humanity. What is a matter of great concern is that geopolitics is progressively influencing the state of our environment, health, food, and energy security and impeding the ability of international organisations and international community and international law to address the concerns of affected nations by adequately helping them during flood, drought, earthquake, epidemics, famine, and energy crisis.

As far as the evolution of military technologies is concerned, ladies and gentlemen, our 20th Century experience was not very ideal.

🌀 Policies, based on exceptionalism, have affected the international processes of sharing of knowledge and technologies, integration of defence industry and global supply chain and access to advanced weapons system. This myopic approach has negatively affected regional stability and led to dangerous, irresponsible, and provocative strategic behaviour, particularly in South Asia. 🌀



In terms of geoeconomy, while modern technologies offer unprecedented opportunities to talented individuals, dynamic organisations, and vibrant nations to gain much greater access to distant overseas markets, ladies and gentlemen, they also

pose new challenges related to transparency, accountability, auditing, tax collection, financial crime, unfair banking practices, cyber security etc. Addressing all these complex challenges requires national resolve, institutional evolution, cultural change, legal reform, and international cooperation.

Ladies and Gentlemen, the impact of emerging technologies is profound in terms of nature, global in terms of scope and strategic in terms of effects as it has simultaneously influenced the political, social, cultural, economic, and military domains. This has created new challenges for traditional military structure, cultures, services, and processes at all levels.

The advent and advancement of new technologies such as Artificial Intelligence and machine learning are now affecting almost all aspects of human life and global environment. Additionally, Lethal Autonomous Weapon Systems such as UCAVs, loitering munitions, along with hypersonic missiles and space militarisation, are having transformational effect on the nature, character, complexity, and speed of warfare. This, in turn, has significantly affected the strategic decision-making system and process, battlefield and information management and the entire philosophy of military training and leadership also.

Ladies and Gentlemen, these technologies or technological advancements have forced a critical review of traditional strategic thought and major paradigms of defence and strategic studies. This has led to evolution of new concepts in strategic affairs such as smart powers, sharp power, hybrid warfare, gray zone and non-contact warfare etc.

 **Apart from information and cyber technologies, disinformation, influence operations, lawfare and economic coercion are additional tools that are becoming increasingly available to help shape the strategic environment before, during and after the combat operations. In contrast, warfare itself is becoming increasingly complex, fast, lethal and multidomain. The traditional notion of peace as absence of physical violence is under profound conceptual change. However, aerospace power by virtue of its unique attributes is evolving much faster and is shaping battlespace beyond battlefields around the world much more than other relatively conservative continental and maritime domains.** 

In fact, today, these domains are far more dependent as well as vulnerable to aerospace power than ever before not only for achieving kinetic and non-kinetic effect but also for information and intelligence gathering, guidance targeting, decision-making, search and rescue and repatriate mobility during natural disasters, peace, crisis and conflict.

“The safety, security, dignity, and prosperity of a nation, in all its manifestations, is the ultimate purpose of Pakistan’s national security and Pakistan Air Force is making an omni-role, substantive and lasting contribution towards all these important national security objectives.”

Since being in office last year, my team has critically carried out analysis, the challenges were identified, the deficiencies were also marked, and above all, prompt action to bridge the gap in short-term, alongside the clearly defined objective for transitioning PAF into a Next Generation Air Force. Virtually no area has remained untouched. In the recent time, the Pakistan Air Force has made significant [progress] in many areas, and I will touch some of them very briefly.

We have realigned our operational doctrine, concept, and strategy in line with the dictates of contemporary and future warfare. Consequently, organisational restructuring has also been implemented to enhance efficiency with rationalised manpower. We are already in process to reduce 12,000 personnel in the first phase by the end of this fiscal year.



The developmental strategy has been re-crafted keeping in view the limitations of fiscal space and availability of technologies. Through our smart induction programme, we have already inducted our contracted jet fighter, including J-10C aircraft in a record time; MALE and HALE UCAVs as well as other unmanned munitions, including killer drone loitering munitions etc; air mobility platforms for header and strategic airlift capability; ground as well as air-based surveillance and C2 system capable of picking stealthy and high-speed weapon system with lower RCS also; offensive air and ground-launched weapon system with multiple employment options such as HIMAD and cruise missile; Electronic Warfare System which is very critical for future warfare for ground and air and

well beyond with good ERP; cyber capability in all domains, ladies and gentlemen, space-based offensive and defensive capabilities.

Ladies and Gentlemen, [the] next area of my special focus has been Human Resource Development with modern parameters from our nurseries to professional military education from lay-by to facilities, all have been comprehensively addressed.

🌀 Pakistan Air Force has always been admired and respected for its operational preparedness, high-quality combat training, therefore, is being ensured to maintain highest level of readiness. 🌀

I must mention here that the prompt induction of modern weapon systems was critical to upgrade our operational training paradigm under realistic environment. Leadership and education programme have been revamped by tangible steps at our academies. Personnel policies and promotions, awards and rewards have been reoriented for different branches, cadre, rank, structure as per the contemporary requirement at tactical, operational, and strategic level.

In order to retain flexibility and freedom for aerospace technology in an uncertain future, while at the same time reducing financial burden on the government and creating economic opportunity, I have personally supervised indigenisation effort and campaign which I would like to share with some details.



Ladies and Gentlemen, aerospace industry is globally treated as a strategic industry, rather, I would say is the mother of all industry based on technological, fiscal, social, and national security dividends. Additionally, cyber and IT industry also fall in line with the aerospace industry owing to its tremendous growth and pivotal role. While Pakistan Air Force has remained involved in aviation industry for almost four decades, most of our focus remained towards maintenance, repair, and overhaul.

Though core development and manufacturing capability have been acquired with quite some success in JF-17 Thunder programme, home-grown design, and development ability as well as absorption of core technology, has remained wanting. Next to enhancing our operational capability, this remains one of my main focus as Air Chief. The vision is

to provide an incubator for knowledge creation as well as a comprehensive ecosystem for indigenisation and self-reliance. In this regard, the Government of Pakistan has undertaken several key initiatives, including formulation of a 'Special Technology Zones Authority' and 'National Aviation Policy' to harness potential of aerospace, cyber and IT industry across.

Today for the first time, I am publicly announcing formal inauguration of our flagship project 'National Aerospace Science and Technology Park' commonly known as NASTP.

The NASTP project aims to establish aerospace cluster and Aviation Design and Innovation Centre (ADIC) at Kamra. Importantly, techno parks are being launched in major cities and reputed universities across Pakistan. National Aerospace Science and Technology Park's first Park would be formally inaugurated by [the] national leadership in Islamabad this December-January timeframe. Within two months after that, Techno Park in Karachi would follow where the infrastructure is almost ready. Next in line is Lahore which is coming up fast and will be inaugurated within four to five months. These 'Techno Parks' are within organic set-up of Pakistan Air Force, having clear linkages with national and international technology parks, business centres and technical industry. This is the first time such a venture has been conceived and implemented in a short span of time. This is also the first time when a project has been developed with a clear industrial and technology roadmap.



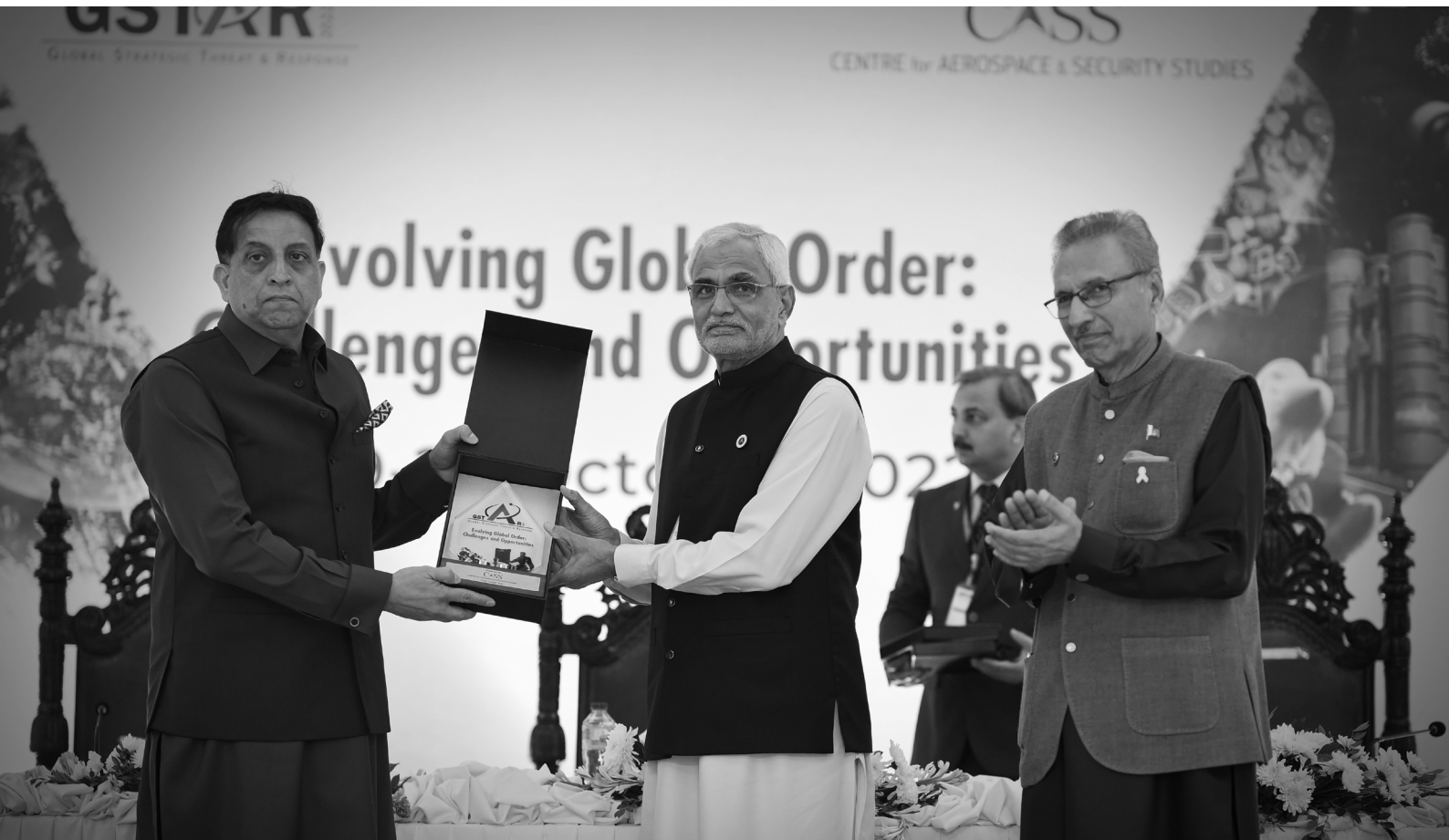
NASTP is well poised to harness niche technologies, including robotics, UAVs, nanotechnologies, radars, software defined radios as well as futuristic capability in smart materials, 3D printing, sensor fusion, supercomputing, Artificial Intelligence, to name a few.

Ladies and Gentlemen, we are cognizant of the current and the future challenges. We, in the Pakistan Air Force, will not leave any stone unturned to enhance our national security.

☞ We understand that the current military and hostile situation, including geopolitical hostilities, pose a serious challenge, and this particular strategic environment makes it a national and regional security obligation for Pakistan to maintain an effective, vigilant, and hard-hitting Air Force that can preserve regional peace and protect Pakistan's security. ☞

Ladies and Gentlemen, in the end, I would like to appreciate the effort of President CASS and his team and all its members who made this conduct of second GSTAR international seminar possible. We look forward to listening to the distinguished speakers from all over the world to share their thoughts and experience with us. May the Almighty bless our collective efforts to fully contribute towards the prosperity of people and progress of our great nation.

*I thank you all, Ladies and Gentlemen, Pakistan Air Force Zindabad!
Pakistan Paendabad!*



Inaugural Address²

Dr Arif Alvi

President of the Islamic Republic of Pakistan



Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force, Air Marshal Farhat Hussain Khan, President CASS, Distinguished Guests, Eminent Scholars, Ladies and Gentlemen, Good Morning.

It gives me immense pleasure to address the Inaugural Session of the Global Strategic Threat and Response 2022 international conference and I congratulate the Centre for Aerospace & Security Studies (CASS) for organising this conference. I must mention the fact that Pakistan Air Force has always been at the cutting edge, has produced heroes in the history of Pakistan and I believe that Air Chief Marshal Sahab, I've been impressed by his hard work and his understanding of modern technologies and his effort because I believe change can only happen when you have humility in the fact that you know that knowledge is far beyond what I can access and as long as your humility continues, you then, become a sponge for accepting knowledge. So, congratulations for the hard work put in by the Air Force and we are confident that it will continue.

Ladies and Gentlemen, the best language for me to speak is Urdu, which is my mother tongue, but I have been informed that there are people on Zoom and on YouTube who may not understand the language. Since yesterday, I was ensuring the fact that, at



2 Provisional transcript as delivered.

least, those people sitting here would have translation facilities, but today still. I think a time will come when automatically as I speak the AI will translate my speech, but the time is still five years hence and ten years hence, until then, I will speak in English, and I hope I will be able to communicate my ideas.



Now, I have been asked to speak on evolving global order, the threats and opportunities and looking at that I think this evolving global order looks at what progress mankind has achieved and at the same time looking at the mix of human emotions which analyses that progress and then handles it and then becomes the decision-maker as far as countries, nation-states or civilisations are concerned.

I will limit myself to three areas on which I will be able to express myself better.

First is what has happened throughout human history which prompts us to find a world order. We are learning from what has happened and throughout human history, there are things which are constant. Human emotions, the human mind is a constant, it cannot be brought down to the simple mathematical $2 + 2$ is four or pure rational thinking. The second is where are we today based on what we have done and whether it provides any lessons so, therefore, the third is how can we have a better and safer tomorrow, that is where a new global order or an evolving global order will have to function.

Looking back at human history, in a dialogue produced by Plato, Socrates had with Glaucon, was his urge to establish a city state, and he said that, there are two essentials of the city state, one is 'Reason', the decisions are based on reason, and that may lead to democracy or whatever form of government we have today.

The second is the 'Desire', the needs coming out from within the body, and that's where Trade comes in, that's where Capitalism comes in, that's where Human Greed (if there is any) comes in. Glaucon asks him, is that enough? He says no, that is not enough. There is also 'Thymos' - the passion, the identity, the struggle for identity, it can be either

a 'Megalothymia', where a tyrant comes in or a 'Isothymia' where the feeling that I must be equal to my neighbour or the feeling that I must be rewarded equally or the feeling that all men are equal; there should not be any discrimination between races, because of colour, because of gender or anything, so 'Thymos' was essential as far as he was concerned.



Then comes along, in my thinking, in my research, then comes along Ibn Khaldun. Ibn Khaldun says that there is a cycle in how this takes place, there is an 'Asabiyyah.' The people who see a nation state and they feel the change has to happen, maybe they are the nomads or those who dwell in the mountains, and they come down and they bring change. He called it a cyclic change and I think he was not the first one to talk about cyclic change. I think Aristotle also believed in a cycle of satisfaction and dissatisfaction. Why this is necessary? Why is all this that I am talking to you about necessary? Because for any global order, a global order not between machines, it is a global order which affects humans, and unless the humans are satisfied, there will be no global order.

Similarly, Kant also believed that history of humankind is a continuity of war and cruelty but then, there are people who came around and said that history is directional, history is not cyclic. Though human emotions are static, they change rarely, and the DNA takes a long time to change, 10,000 years maybe, but there is a directional change and of course, those people who forwarded capitalism, those people who forwarded the part of the new global order which is liberalism like Locke and Hegel, for example, Marx and 'Communism' and Hobbes with his Leviathan and Max Weber and his 'Protestant Ethic and Spirit of Capitalism.'

There are possible readings, for example, how does this function? These economists believe that there is a continuous change that is happening, and therefore, it will function on the two pillars - one is rationalism and the other is needs and wants which establishes 'Capitalism', and rationalism establishes 'Democracy', which is 'Liberal Democracy.'

So, the world order basically was a liberal democracy but then, comes along and [you have read most of these readings which I'm talking about], Francis Fukuyama talks about the 'End of History', but he was not the first to talk about the end of history. I think it was also mentioned by Hegel when at the Battle of Jena that, that is the end of history. Francis Fukuyama turns around and says that the end of history is there because democracy is there as a system of governance which can change depending on the country, and at the same time, Capitalism is there as trade and the benefits of trade and that is it. But then, Samuel P. Huntington comes and that's where the important thing is...

🌀 ...when we talk about the changing global order or when we talk about what happened in the past century, we must bring in the fact that the momentum of civilisations, the momentum of identity, the momentum of a primordial identity in Europe, the fact that races, colour of the skin and civilisations matter, religions matter so, therefore, any new order will have to consider this in between. 🌀

And what are human emotions?

I believe very strongly that human emotions are of 'Love', remarkable!

Every living person in the world would look at an innocent child and would have love for the child or beauty of a flower, that's love, which is there, [in]describable!

The love between man and woman, [in]describable! It is run by our genes, it is run by our hormones, but it is there. The biggest and the best human passion is 'Love.'

Other than 'Love', there is 'Hate', there are 'Phobias', there are battles, and there are wars. The phobias have led towards what this country is doing, what this country is thinking, what is happening? The phobias have led to battles within families. When we don't understand what is happening, we mark it as a 'phobia', we mark it as an 'enemy'.

So, there is 'Love' and 'Hate', and then, Hate leads to Phobias.

But there is also need. Hunger, for example, that has to be satisfied.

Phobias have to be handled with rationality. [Either], there are two possible approaches - one is to totally consider the human psyche as the driver of everything, and then you can pick up a Machiavellian approach, that this is human nature, absorb that human nature entirely. Man may be evil and, therefore, all your national workings have to be that, human greed or all its evils can then help shape the future based on simple human nature.

I remember reading a book by Robert Greene. I think it was '48 Laws of Power' and after reading the book, I wrote on the book that this is not for me. Why? In the '48 Laws of Power', he develops more on the Machiavellian situation and says that look at human nature, consider this as is, can't change and then develop all systems upon it.



However, one part of what happened over the last few years, I think, very important as far as the global order is concerned, is the emergence of Europe, i.e., renaissance. While the beauty of the Renaissance was in art and sculpture and the buildings of churches, if you go to Europe, you can understand the beauty of the Renaissance and the opening to knowledge.

At the same time, there was a struggle, a primordial situation of war, primordial identity where there were wars and what led to the 'First Global Order' were these wars so, therefore, some understanding and some mentioning of the wars is essential.

There was a Hundred Years' War or an Eighty Years' War starting from 1340s went into 1400s, and then, there was a Thirty Years' War which started in 1618 and ended in 1648. Why was this war important? Europe had gone through many wars. Why was this war important because when it ended, it ended in the Treaties of Westphalia. There were two treaties in Westphalia and what was the determined world order then was recognition of nation-states as inviolable as far as their borders were concerned.

☞ The first demarcation in history, as far as nation-states are concerned, is the inviolability of the nation-states. ☞

This second part of that treaty was non-interference in another country - in the other nation-state - the second most important thing.

Looking at that, Kissinger also wrote in one of his books that this Westphalian Treaty was established without considering any other civilisation - it was Europe deciding for the rest of the world, so that was the first, I think.

What also happened during the Mediaeval Era, which is very painful to mention, but it is there, it has happened despite what was happening in Europe. At the same time, there was colonisation in the rest of the world. There was brutality, there was exploitation, and countries and regions have not forgotten that, for example, Africa. Africa is another region which is ready to rise but it is deprived of health, education, and all opportunities but it



is exploited to the hilt, it is exploited as far as human research is concerned, pure slavery, capturing humans taking them to other continents and then the European powers ruled on it. For example, in Congo King Leopold II, it is considered that he was responsible for more than a million deaths - where if you did not meet your rubber quota, arms and legs were cut to give the tribes a signal that you have to meet them. This kind of blatant brutality went around in the world - colonialism in its raw form and colonial exploitation, looting and plunder and enriching prosperous countries in Europe and making rest of the colonies and the world very poor.

Also keep in mind, what were the laws written then? The laws were never the same for the people. The savage people did not deserve any consideration, whether they were Red Indians or the savage people of Africa. Even Thomas Jefferson has talked about that, and he appreciated the fact when the Cherokee Nation was wiped out, he said this is what had to be done to the savages, [as they were believed to not have] any humanity base, understanding of laws. That is another pain which exists throughout history of regions which have gone through that kind of exploitation.

We still remember what happened in Indo-Pakistan subcontinent. People can point that out.

Looking at the era of the First World War, 40 million people dead and in the Second World War, 85 million people dead. Then, came a movement which is very important which brings us to today, that is, the battle between humanising war or ending war.

One of the humanists who looked at the fact that war must end, I am a believer that wars must end, you cannot humanise wars, but then there was Tolstoy. At 22, he went into a war, and he saw the misery of war. He saw the fact that one day when a ceasefire flag is waved up, people cease fighting among themselves and they sit down to pick up the dead and to pick up the wounded, and next day, you are back on the ground with the same animosity, with the same evilness, killing people and destroying homes. So, Tolstoy was one of the first few who talked about no war.

Then, there was a movement which started humanising war. Henry Dunant who got the first Nobel Peace Prize, he was a person who said that there must be civilised wars, there must be rules to wars. The peace movements also run by an Austrian lady by the name of Bertha von Suttner. This peace movement said there must be an end to war.

☞ The day you humanise war, you permanently establish the fact that man will keep on fighting, and the stronger man will fight, and the weaker man will succumb. ☞

When the Nobel Committee wanted to give the first Nobel Peace Prize to Dunant, the peace movement said that this is unfair so another French person who was a pacifist was also given a Peace Prize at the same time just to make sure that both concepts continue. Here, I must quote the First Sea Lord Admiral Fisher who said that when you talk of humanising war, you might as well think of ‘humanising hell’ also in the future.

After having said all this, where are we today?

Because when we talk about tomorrow, we must understand what happened after the First Global Order which I considered was Westphalia. I think, after Westphalia, the world went through tremendous [number] of killings, the First World War, the League of Nations happened, and then the Second World War, United Nations was established in 1945. I believe the devil was in the details as it was the people, the nations who had come to victory, who wrote down the laws for the new era.

☞ I think that one of the things which comes out much better today is the fact that the United Nations was there to ensure that Europe does not go to war. ☞



You can practise your weaponry outside of Europe, you can go to Vietnam, you can go to the Philippines, you can go to Korea, you can go to Laos, Cambodia. The West is not concerned. There were areas of influence which were demarcated, nations were divided causing a 38th parallel in Korea. In Vietnam, napalm was used, you remember My Lai and other atrocities.

🌀 **Keep in mind that the rules were written, but surreptitiously, all rules were broken.** 🌀



Do you think that that is what man is?

Anything which he can do, he will do hiding the fact, he will do. All rules of Geneva and all Conventions of The Hague have been broken. Laws have been written, people have been made landless or identity-less to be able to break the laws.

Historically, Gulf of Tonkin, for example, today, we read that it was not a real happening. It was created to create a war by responsible countries. What brought it into focus (and what brought into focus brings out the fact which I want to talk about what would be the importance of a new global order). What brought it out, for example, was that naked girl fleeing from napalm. What brought about Seymour Hersh's exposure of My Lai massacre.

I have a statement written here in my notes that General Curtis said, 'Bomb them back into the Stone Age,' which was similar to a dialogue which Pakistan heard in the early part of this century. That you can be bombed into the Stone Age. Remember that what's happening is happening again and again. It has not ended.

I mentioned Philippines, Korea, Cambodia, Laos, the scorched-earth policy and then 9/11 which I very much empathise with the American people. Innocents were killed. I do not want to ignore 9/11 neither the reactions of 9/11 whereby there was total devastation in that reaction west of Pakistan. So, this is what has happened after the global order of the United Nations establishment in 1945. Then, you can continue counting Syria, Lebanon, Palestine, and Libya. Democracy is fine but if it gives a verdict against us, for example, in Algeria, it is not acceptable.

What is humanity being fed?

☞ Humanity is being fed vested interests garbed, given the clothing of ideological interests. ☞

I do not think man is ready to accept that continuously anymore. The massacre which happened in Yugoslavia and the world slept, has been very painful for people who remember that. I believe Bush, Bush Jr., made a statement that there is no substitute for American leadership. It is a hubris which has to lead the way to some form of cooperation. And I still remember another statement where the UN Secretary General went to meet President Bush at Camp David and Bush told him that it was important that we get full implementation of every United Nations resolution. Imagine, a poor, newly born Pakistan trusting the newly formed United Nations with its resolutions and we are still fighting for the implementation of those resolutions but for his need, President Bush makes a statement that every United Nations resolution is important.

So, coming from there, ladies and gentlemen, I must talk about the dangers of today.

☞ When you talk about the global order of tomorrow, you must understand the dangers of today. ☞

We have survived accidentally. Let me tell you that there are numerous examples, at least five or ten examples, where nuclear warfare was about to happen because of human error, and it stopped because of human interference. For example, during the Cuban Missile Crisis when in the Russian gunboat before the captain fired missiles, he was stopped because that was a bad message.

Similarly, in other areas, I can go into five detailed accidents where they were about to fire nuclear missiles, but then imagine the dangers of today, at that time, there was a 20-minute or a 30-minute possibility or a window for thinking when a missile would be fired and missile would hit, but today with what was mentioned by the Air Chief Marshal Sidhu that with hypersonic missiles that window has shortened. For example, between India and Pakistan recently a missile hit Pakistan within two minutes after its launch. Is that enough time? That was a very irresponsible thing that happened, and India has yet to investigate that. India has yet to investigate nuclear uranium being sold in India.

☞ India has yet to investigate a lot of mistakes it has made in its nuclear programme whereby the world has been endangered. ☞

I am just talking about the difference between the time a missile is fired and time when it hits, i.e., a few minutes. The world is really in danger, much more in danger than ever before. We have to consider that.

Now, the Air Chief Marshal mentioned cyber power, the ability to attack utilities, finances, your defence, everything which runs on the Internet, the ability to strike that and paralyse a country. That is a tremendous change which has happened which has not been recognised and I will tell you why not. Through DDoS (Distributed Denial of Service)

attack, imagine you remember the Stuxnet monster which increased the speed of Iranian centrifuges and affected them.

So, what I am saying is there is a fossilised old system which was established on the basis of power focusing on the nation states. That power has been dissipated into other centres of power. That was a unique situation for 300 years that the nation state wielded all the power, the nation state wielded the ability to pick armaments, citizens were not allowed to, that power has been challenged.

Cryptocurrency, NFTs, AI-driven systems of war which the Air Chief Marshal talked about, the fact that Artificial General Intelligence is being sentient. For those of you who may not understand what sentient is. There was a Turing Test. Alan Turing was a cyber code breaker and the way you can differentiate between maturity of a computer and human is that there is a computer in one room and a human in another and there's a human which is asking questions to the computer and to the human and the day they're not able to differentiate between the human and the computer that is where AI will become sentient.

Today a Google employee put a blame on what was happening inside Google that AI is become sentient, that is a danger which is separate I will talk to you about it. Because that will lead to the fact that the linkages between man and data and the Cloud is still through what I write or what I speak. But the time is coming when that linkage may happen through the mind, that will be the cyborg ability to be able to get that picture just by thinking of the process. That is too technical to be speaking of here but at least warning you that the time is coming like that also. And, then people have warned about superintelligence emerging as a unitary form that is a danger by itself. I suggest to you the book 'Super Intelligence'.

Even today, in the Air Force, for example, DARPA, the Defense Advanced Research Projects Agency has done research in which an AI pilot [programme] defeated an F-16 expert pilot, and not through long periods of training.

No institution recognises the changing world, the power centres are changing. I will go on further with that. War bots are in the picture and the rules of the war bots being discussed and decided out within the countries is that you should kill only those I want you to kill. You should understand my intention and work creatively, autonomously and the third is you would protect humans on my side. So, the war will be licenced towards AI and robotics and wingmen and swarms of bots around the pilot, a single pilot this is something which you will understand, Air Chief Marshal [Sidhu] more than others.

So, what is the world demanding?

🌀 The world is demanding a one-world solution. The world is not demanding a nation-state solution. Nation-states are being challenged by multinational global players for the last 50-60 years. 🌀

Democracies have been undermined or overwhelmed by oil interests, pharma interests, undermined also. You can look at the history of any country where decisions are made based on vested interest of power lobbies.

Humanity is also demanding emancipation. There should be a difference why is that? The rules of my country apply on my citizens, but for the rest of the citizens of the world, I have evil rules. It cannot happen like that. You cannot isolate disenfranchised people from their humanity. For example, I think the name of the American lawyer was Yoo, who established the fact that in Guantanamo Bay, you can be disenfranchised. The laws should be there for terrorists also. I am not saying that law should not be there, but the laws should be what can be applied to everybody rather than a separate law for savages. So, humanity is demanding emancipation.

You have to reconsider the refugee issue; the world has to reconsider humanity as an issue rather than refugees based on colour and skin.

🌀 Pakistan has been a giant in the world as far as morality is concerned. We have had four million refugees for 40 years while countries were not accepting refugees. 🌀

I wish the refugees of Ukraine are being treated well and I wish all refugees in the world should have been treated like that. I made a statement on Twitter when I said that I just read the two cruise ships have been hired to handle refugees and I said if that is made a compulsion, I think one way of reducing wars was making sure that all refugees go into cruise ships, or they may be given such a treatment.

COVID-19 showed the lack of emancipation as far as global health is concerned. The rich countries treated rich countries better than the poor countries. Of course, some vaccines went there but that was again a challenge to our psyche, to our thinking, that we are human and that is where it should come about.

There is an emerging China which we have talked about, and it is like the new Athens in the Thucydides Trap that Sparta was the established power and then, as Athens came up, so Athens was attacked to limit its power.

Now, how can we have a safer and better tomorrow? Now that is the last part of my speech.

I must quote to you 'Alice in Wonderland', the Cheshire Cat says to Alice, 'If you do not know where you are going, any road will get you there.' We should stop repeating our mistakes, we should stop re-doing what we have done before. Looking at the last century where millions and millions and millions of people died due to humanising war to ensure that war continues, to establishing robots identifying a person.

You see, assassination internationally was condemned even by the United States when Israel was targeting Palestinians calling 'targeted assassinations.' It was George Bush who said that this is not well, this is illegal in the laws of the world that you identify somebody, target and kill. But the same thing has been adopted. So, that means the laws of the world will change according to what I want to do. That's a dangerous trend - unless man grapples that, there is going to be no new world order, just some mixing and matching of things what are necessary today and looking at the trees rather than the entire forest.



For a New World Order, we must recognise a multivalent world with multiple centres of progress. For a new world order, we must accept its complexities, religions, castes, and cultures. We must devise new ways of working on emerging issues. We must change our priorities, that is the most important part.

Securing our borders, securing our resources is fine. But, beyond that exploiting other borders and resources. Oil is a priority and, therefore, we can go to war - should not happen. You know how much money was spent in and I do not trust think tanks anymore. Sorry to say it to all of you who are part of some think tank. Why? Because these are the think tanks which came up with the policy of 'Mutual[ly] Assured Destruction'. Do you remember that? If 10% of the people of my country are destroyed, we are going to destroy 50% of theirs. If they, then come back and hit 60% of ours, we are going to go back. So, what is the satisfaction when I am dead and the majority of our people dead to ensure that everybody is dead. Is that 'Mutual[ly] Assured Destruction'? That is the policy which countries believed in.

So, we need a different anchor to consider these policies.

☞ Only securing our own people is not the logic which can lead to a future world. ☞

How much money was spent? I was trying to calculate yesterday looking at whatever sources were available, in the 30,000 or more nuclear weapons the United States accumulated, they spent close to USD 6 trillion. Imagine the Soviet Union must have spent another USD 6 trillion. Imagine, what could have been done to human needs of hunger, starvation, health? Even a trillion dollars would have changed the world. So, we must change our priorities, ladies and gentlemen, starting from here [this room].

Then, there's a big issue of global warming.

☞ You must encourage an environmental paradigm shift. That is what the world is demanding. The Earth is demanding a one-world solution. ☞

Embrace people, even migration with protection. How can you have colonially destroyed countries or anybody and resist human migration? Ensure your protection but welcome people. Unless people are emancipated in the world, it does not come to one-world. It will keep on in conflicts.

Invite innovation and nurture global leadership.

And then, my most favourite part is Rumi.

I have been talking about the needs of Pakistan, and I want to tell you the need of Rumi. Rumi said the first thing, love, has eight stages as a solution to mankind's animosity and wars etc. Love yourself, clean the heart, clean the mirror of your heart, so you understand. Then, love your family, the second part, goes beyond you know.



Give hope to your own children within your family, love to your own children. Love your neighbours, then, love your nation. Love your nation and love humanity. The wars today are basically [because] we do not consider humanity as our equals; they are savages which have to be treated differently. Then, furthermore, his sixth pillar is very important, and it looks at global warming today. He says that love the earth, both the inanimate and the animate - the clouds, the water, what the earth is begging from humanity. So, you love the Earth and love the Prophet and then you love your Creator.

So, a new global order, which I am saying is different from the testosterone-based world order [in] which we have lived until today. The first thing for that new global world order is humanity, equality of men, of course, of woman, then health, equality for all, then education and food for all, important. That should be the goal of the world order not just the fact that temporarily let us live in peace.

The second is a world order based on morality. But what is morality? Morality will always have a question mark. So, I thought about it yesterday and I have a suggestion that all laws when cleansed of vested interests become a morality by itself. It does not have to be a religious morality. It has to be laws of the world cleansed of vested interests - that is the second pillar.

The third is environment, is begging for the world to come together, and that should be a priority of the new world order.

The fourth is recognise the new power bases and restrain the harmful effects which the Air Chief also mentioned. We do not understand the new power bases, meta, cyber, data, the ability to influence the information coming to you. It has gone beyond the nation-states. It has gone beyond the United Nations. It can modify but it is today, fossilised in the sense that if it does not recognise new centres of power, it cannot do much in the future.

So, the fifth is control emerging weapon technology, which is a must. What was talked about, it is dangerous. It is going to hit people individually and there is no human war.

The six pillar is no war as different from human war. Peace is not only the absence of war but absence of issues of conflict.

The world is demanding a new global order not based on what is dictated, not based on phobias which are generated in every generation, not based on the fact that every generation unlearns what the previous generation has learnt.

In the end, let me quote people who have really thought about the fact that the human race, having spent 10,000 years of history, is under serious danger.

☪ The DNA-based human race, the carbon- based human race may give way to the silicon-based future. ☪

Yuval Noah has talked about it. Stephen Hawking, in his last book, talked about the danger and they are predicting the fact that we have been saved from nuclear accidents just by accident itself. We may not be saved by accidents in the future if mankind continues in this path.

So, thank you, Ladies and Gentlemen, Pakistan Paendabad.





Working Session I

International Security Environment: Emerging Challenges and Opportunities

19 October 2022



Working Session I

International Security Environment: Emerging Challenges and Opportunities



Speakers:

Ambassador Robin L. Raphel, *Senior Advisor, Center for Strategic and International Studies, USA*

Prof. Dr Yan Xuetong, *Dean, Institute of International Relations, Tsinghua University, China*



Ambassador Riaz Mohammad Khan, *Former Foreign Secretary, Government of Pakistan*

Moderator:

Ambassador Jalil Abbas Jilani, *Advisor (Foreign Policy), Centre for Aerospace & Security Studies, Islamabad, Pakistan*

The moderator **Ambassador Jalil Abbas Jilani** provided an overview of international security environment and said that unprecedented developments had taken place in the regional and global landscape with far-reaching implications for Pakistan, South Asia, and the world. Whether, it was the US-China rivalry, an assertive Russia, an uncertain situation in Afghanistan, an aggressive India in South Asia, India-Pakistan tensions, or the formation of new alliances, all these developments had the potential to disturb the existing political, economic, and military balance. The great power rivalry and competition,



and the significant challenges they posed for global economic, political, and strategic stability underscored the importance of developing mechanisms to avoid confrontation and peacefully manage global competition.

The US Indo-Pacific Strategy: Implications for International Security

US' Indo-Pacific Strategy, 2022

Ambassador Raphel stated that the US 'Indo-Pacific Strategy', which was launched in February this year, was in recognition of the fact that the Indo-Pacific was the most dynamic region in the world. The US wanted to restore its leadership role in the region by reviving long-standing bilateral alliances with countries like Australia, Japan, Korea, the Philippines, and Thailand; re-energising the QUAD (the US, Japan Australia, India relationship); strengthening the US relationship with ASEAN, and also building up emerging partnerships with countries like India and the Pacific Islands.

Free and Open Indo-Pacific

Sharing the US' vision for the Indo-Pacific, she said that her country desired a free, open, connected, prosperous, secure, and resilient region. This meant that the seas and skies should be governed by international law and that the agreed rules were seen as fair and adhered to by all means. The US needed to extend and modernise its defence and diplomatic presence in the region and enhance interoperability to promote US values but also to engage in important issues like climate change and pandemics.



The Indo-Pacific Economic Framework (IPEF)

In May 2022, President Biden launched the Indo-Pacific Economic Framework (IPEF) for prosperity with a dozen initial partners - Australia, Brunei, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Vietnam. These countries, Ambassador Raphel highlighted, represented 40 percent of the world's GDP. The IPEF would focus on regulating the digital economy by promoting clean energy, secure supply chains, and promoting transparency.

Competition with China

She acknowledged that the 2022 Indo-Pacific Strategy referred to competition with China in which, the regional states needed to make their own choices. However, in her view, they should not be coerced by China nor by the US.

Promoting Democratic Values

The Strategy also called for investing in democratic institutions and civil society; improving transparency for promoting free trade; and maintaining peace and stability across the Taiwan Strait. All of these activities suggested a coordinated effort to promote standards, which in her perspective, were not part of China's playbook.



New National Security Strategy 2022

The Ambassador pointed out that the Biden Administration's recently released National Security Strategy was delayed on account of Russia's invasion of Ukraine. However, it appeared consistent with the Indo-Pacific Strategy. It prioritised competing with China, constraining Russia, as well as grappling with global challenges like climate and pandemics through investments, alliances, and competition. It categorically stated that the US would deal with any country regardless of ideology or political structure that wanted to uphold a rules-based order and tackle global challenges. It aimed to help like-minded countries, to solve their problems rather than forcing them to choose between China and the West.

US Policy Shift towards Asia

The US undertook a substantial military diplomatic, and economic reorientation towards Asia starting with the Bush Administration in the mid-2000s. The aim was not to contain China's rise, rather the US sought to manage China's growth through a blend of internal and external balancing, combined with expanded engagement with China to preserve the existing power balance in the region. Subsequently, President Obama's 'Pivot to Asia', essentially carried out the initiatives started by President Bush and the G20 like the Trans-Pacific Partnership, the Strategic Partnership with India, and the Pacific Command Force Posture changes. The Ambassador also shared that President Obama established a framework for engagement with Southeast Asian countries. He favoured diplomacy and pledged to respect China's core interests but later found that he needed to take a tougher line.

The Indo-Pacific Region

Discussing the historical background, Ambassador Raphel informed that it was in 2017, the Trump administration was the first to formally use the term ‘Indo-Pacific’ as opposed to ‘Asia-Pacific’. It was adopted by Japanese Prime Minister Shinzo Abe, who believed it implied a more expansive region encompassing all of the Indian Ocean, including the Persian Gulf, and also to give a nod to India and encourage the latter’s cooperation and plans to counter China. The speaker acknowledged that the Trump approach was quite consistent with the previous administration in confirming Asia’s importance in US’ foreign policy but with a focus on threat perception. This ultimately led to US withdrawal from the Trans-Pacific Partnership.

Challenges to the US Indo-Pacific Strategy & Framework

On effective implementation of the Indo-Pacific Strategy, the Ambassador was of the view that it would be a challenge for the US as strategic competition with China would require a major concentration of her country’s diplomatic, economic, and military resources. Although the US withdrawal from Afghanistan, efforts to build a stable and predictable relationship with Russia and the Iran nuclear deal were all aimed to free up US resources for the Indo-Pacific, Russia’s invasion of Ukraine had upended that strategic calculus. So, the challenge of resources was bound to intensify in the coming years. Ambassador Raphel also said the Strategy also contained some perennial contradictions. The Indo-Pacific’s political landscape was diverse; ranging from liberal democracies to authoritarian and hybrid regimes. She opined that the US probably needed to consider more pragmatic language like a secure and prosperous region rather than a democratic one. She also pointed out that the US could not build a new regional economic framework without new trade agreements. In a region where many of the countries valued economic cooperation more than traditional security cooperation and counted on China as their largest trading partner, the US needed to make an economic policy a linchpin of the Indo-Pacific Strategy. In her view, the non-inclusion of Pakistan despite it being a democracy of 220 million people and situated in the Indian Ocean was another problem in the Indo-Pacific Economic Framework. She argued that the US strategy and economic interests would be best served simply by returning to a revised Trans-Pacific Partnership.



Collective Balancing Strategy

On the needs for a collective balancing strategy, the speaker remarked that the US allies and partners had limited military capabilities to bolster deterrence, and they might not be willing to enhance these capabilities especially given Russia's invasion of Ukraine. A more realistic statement of US strategic objectives would require re-thinking the Indo-Pacific geographic formulation and narrowing the US' regional focus to East Asia and the Pacific.



Implications for International Security

Ambassador Raphel opined that Russia's invasion of Ukraine would cause the US to prioritise countering the present threat posed by Russia over the longer-term threat of Chinese dominance. Russia's ineffectiveness on the battlefield, paired with the increasing investments that the European nations were making as a result of the invasion had made the possibility of a 'US Pivot to Asia' more likely. In her analysis, the US knew that if it sacrificed this pivot to Asia, China would likely increase its influence in the region and promote its global security policy. The Strategy, if rigorously implemented, might have the opposite of the intended effect; rather than deterring China, it might provoke China.

She stressed that it was important for the US to realise that the challenge posed by China was far more complex than former Soviet Union. China was an economic powerhouse, it has integrated into the global economy, and was enmeshed in nearly every global supply chain. So, contrary to the Cold War, where there were well-defined spheres of influence, these conditions were not present today.

Conclusion

While concluding her talk, she held that the new Indo-Pacific Strategy provided an opportunity for stable balance of power in the Indo-Pacific region that would allow all countries, including China, to grow and prosper. If carefully managed and implemented, this Strategy could promote global security and allow the US and other countries to live in a better and safer world.

China's Vision for Regional Peace and Security in the Evolving Geostrategic Environment

Professor Dr Yan Xuetong was of the view that the post-Cold War was over, and the world was moving towards a new international order. Unfortunately, this order was not progressing and had caused 'uncertainty' around the globe. New phenomena such as strategic confrontation between China and the US, de-globalisation, economic sanctions, technology cravings, digital technology competition, arms race, and the war between Russia and the West were all important factors in shaping the current order.



US-China Competition

Currently, both states considered each other the biggest challenge to the current world order. In Dr Xuetong's view, the US had adopted a 'small yard and high fence strategy' to contain China. This could turn into an all-around confrontation in the domains of military, trade, technology, finance, diplomacy, media, and ideology. From the Chinese perspective, it was unfair for the US to be the only dominating and leading global power because China had equal rights to become as powerful as the US. According to the speaker, there was a complex zero-sum game going on between the two countries. Their bilateral competition had impacted not only their bilateral relations but also their relations with third-party states. He asserted that like the US, China had not forced nor pressurised any third-party states to choose a side in the US-China competition. However, he observed that the competition would inevitably put pressure on third-party states.

De-Globalisation

Dr Xuetong argued that globalisation which had first started after the Cold War ended had now been replaced by the process of 'de-globalisation' as a main trend of the upcoming world order. The process of 'de-globalisation' started with Brexit in 2016 when the United Kingdom (UK) withdrew from the European Union (EU). It was further strengthened when the 'trade war' against China was initiated by the Trump Administration in 2018, and also during the COVID-19 Pandemic. He said that many industrialised countries and the EU had developed their own independent supply chains. Therefore, given such developments, major powers and the EU, which once used to be a strong supporter of globalisation, were now hesitant to advocate the same.

The Digital Age and National Security

Dr Xuetong highlighted that currently, the world was moving into the ‘Digital Age’. In this age, data competition between major powers had become a very serious issue. Reliance on the Internet had increased in this age for various purposes, including education and teaching, but he felt that this was creating social uncertainty. While digital technology



was giving access to various social media platforms, they had become sources of disinformation. He considered this to be an imminent threat to the security of states not only in developing countries but also in developed nations. Such changes, he cautioned, would increase uncertainty because when a foreign policy was mainly based on the concerns of a regime’s security and domestic interests, it would never be stable. Therefore, in his perspective, data technology was making the world uncertain and pushing it in a backward direction rather than helping it in moving forward.

Ukraine War and the Current World Order

On the Russia-Ukraine war, he predicted that the war would not end in a short time. Russia and the West would stay engaged against each other for a long time. This, the speaker said, could have a negative impact on the current world order as it would not only undermine the security environment in Europe but also create a negative impact on the security environment in South Asia, Southeast Asia, Northeast Asia, and Central Asia. It would increase inflation and impact the already broken international supply chains, which would inevitably increase economic uncertainty in Asia and around the globe.



Conclusion

In his concluding remarks, Professor Xuetong stressed that the world would witness a worsening global order and regional conflicts in Central Asia, Southeast Asia, and East Asia would become more intensified as the world had not witnessed any sign of cooperation from major powers to reduce them and effectively manage competition. Reversal of declining world would be almost impossible, he warned. He also acknowledged that the competition between the US and China was different from that of the US and former Soviet Union since it was not driven by ideology, expanding geographical occupation, or changing the regime inside, it was rather focused on technological advancements that would make the new world order.



US-China Rivalry: Options for Pakistan

Ambassador Riaz Muhammad Khan opined that the economic rise of China was seen as a challenge in the West. The Western narrative was that the Chinese economy overtaking the US economy could disrupt the world order, and Chinese loans to developing countries would ensnare them into a debt trap. However, so far, not a single country had gone broke under the weight of Chinese loans. Quoting the example of Sri Lanka, he said its financial crisis was caused by the depletion of remittances, the collapse of tourism because of COVID3-19, and the downturn in agriculture, etc.



US-China Rivalry: Ideological, Military & Technological Dimensions

Discussing the ideological and military dimensions of US-China rivalry, Ambassador Khan said that the Western model of a free market, combined with liberal democracy, and individual freedoms was dynamic. Whereas, the Chinese model, 'Marxism with Chinese characteristics' was described as state capitalism or a free market with one political party control. Since the 1980s, this model had shown phenomenal efficiency in propelling targeted growth. He stated that while the Chinese system was relatively closed, China itself had benefitted greatly from Western technology and scientific education.



Since China offered an alternate model to the world, it had emerged as a competitor to the ideological primacy of the West. The former Foreign Secretary added that the global influence of the West was underpinned by its military superiority. The US continued to retain an unmatched capacity to deploy its forces around the globe regardless of setbacks in Afghanistan, Iraq, and Syria. Russia had shown a proclivity for military intervention it had in Syria and now in Ukraine, but it was limited in scope. China had yet to demonstrate such military progress. China's clashes with Vietnam 40 years ago and with India recently were essentially border skirmishes with a narrow context and purpose. However, China had not demonstrated an inclination to use force. Ambassador Khan further added that the US and the West would do all they could to deny China access to advanced technology. However, China had developed its own critical technologies, Artificial Intelligence, space, and Computer Sciences. China was also relying on its linkages in the Asia-Pacific, Europe, and Taiwan.

Changing Dimensions of US-China Rivalry in the New Global Environment

Ambassador Khan was of the view that countries would have to adjust to US-China rivalry, which would become a constant feature in the new global environment. On the possibility of a large-scale conflict between the two powers, he remarked that Americans believed that only conflict could restrain China economically and militarily. India was unlikely to take on China. Hence, the most likely region for Sino-US conflict was Taiwan and the South China Sea. According to his analysis, Chinese military actions in Taiwan would pull the Far East and South East Asian countries together behind the US as Ukraine had



brought Europe together behind the US, making it a nightmarish scenario for China. It could politically prevent Taiwan from taking any irresponsible military misadventure. The conflict would serve no one's interest in the region as the world was no longer a place for domination through occupation. It was moving towards multipolarity and regionalisation of power rather than its concentration towards a single pole. He stressed that the world also faced new challenges of climate change and environmental degradation which demanded cooperation and judicious use of resources.

Options for Pakistan

While deliberating upon the options for Pakistan, Ambassador Khan urged abandoning the notion of Pakistan playing the role of a mediator between the US and China. He advised that Pakistan must play with a straight bat because it could not outsmart major powers. The country's relations with China were strategic, and it could not play games at their cost. China had stood by Pakistan in difficult times politically and economically. CPEC had been the single most important FDI activity in recent years. For Pakistan, China also provided the only available venue for advanced and sensitive technologies and education in advanced sciences.

On the issue of terrorism and extremism, he pointed out that these were mostly the result of Pakistan's own misplaced policies that resultantly discouraged FDI. With the US, Pakistan desired good relations but not at the cost of relations with any third country. He advised that if the US demanded the same, Pakistan must firmly resist to enhance a relationship of respect between the two countries.

Conclusion

Ambassador Khan concluded that Pakistan must modernise its economy, education, and every facet of its national activity like China. He shared his concern that being an

agricultural country with vast plains and water, Pakistan should not have to import wheat, cotton, pulses, and edible oil. He recommended that Pakistan should develop cheaper alternatives in other areas such as defence as begging for loans to pay back loans brought no respect to a nuclear power state; and policymakers should learn responsible politics and the value of ethics in their political behaviour. He stressed that the latter was important as Pakistan's search for a magical foreign policy manoeuvre owed largely to a lack of vision and failure of developing sound domestic policies.





Working Session II

Geoeconomics: Driver of the Asian Century

19 October 2022



Working Session II

Geoeconomics: Driver of the Asian Century



Keynote Speaker:

Dr Moeed W. Yusuf, *Former National Security Advisor, Government of Pakistan*

Speakers:

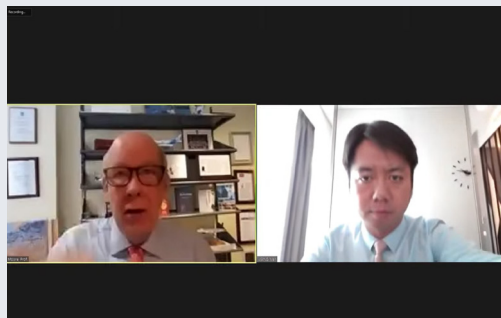
Dr Una Aleksandra Bērziņa-Čerenkova, *Head China Studies Centre, Riga Stradins University, Latvia*

Dr Karl J. Moore, *Associate Professor, McGill University, Canada*

Dr Wang Wen, *Executive Dean, Chongyang Institute for Financial Studies, China*

Moderator:

Dr Usman W. Chohan, *Director, Economic Affairs and National Development, Centre for Aerospace & Security Studies, Islamabad, Pakistan*



Introducing the concept of geoeconomics, the session moderator **Dr Usman W. Chohan** defined it as amalgamating the strategic worldview and economic interests into common objectives. He argued that geoeconomics was an ‘orphaned subject,’ with International Relations scholars looking at economics in a cursory manner, and economists ignoring it for ideological reasons (state vs. market dichotomy). Despite the ideological gap, some countries were excelling in the application of this concept while others were not. The most



successful practitioners of geoeconomics, in his analysis, were countries with peculiar state-market relationships: China (state-owned enterprises), Russia (oligarchic structure), and Iran (sanctions regime). India was a weak performer despite its bravado (as seen in India's failures in Afghanistan and Nepal). According to Dr Chohan, the US was poor at geoeconomics because of the competing logics of its market (the New York community) and the security state (Washington community). There was merit in these competing logics because of the need to view the complex world differently, but it led to limitations in geoeconomics. Dr Chohan stressed that as far as geoeconomics was concerned, a state-market relationship had to be formed where those following differing logics could reach a mutual understanding.

According to the session moderator, Pakistan had played an especially important role in the four most important global movements since 1945, including:

- i. De-colonisation,
- ii. Cold War,
- iii. So-called War on Terror; and
- iv. So-called Cold War II (a novel term which some use but to which he personally didn't ascribe to).



Yet, the geoeconomic element, at least in the first three, remained wanting, driven as they were by the security logic. He remarked that the fourth movement might be different in terms of economic outcomes if geoeconomics was given primacy.

In the present day, a few countries had noticeably clear strategic and economic alignment with one of the two superpowers, i.e., the US or China. He mentioned Russia (China), Iran (China), and India (US) as cases in point. However, most countries were having difficulty re-aligning themselves with one of the two superpowers. He mentioned Australia and Canada (economy: China; security: US), Singapore (both), and Pakistan (economy: US, security: China). Dr Chohan opined that the forced choice of aligning with one of the two superpowers was not easy, and it was not good for the countries to be coerced into choosing sides, as was true during the same period in the 20th Century. He lamented that the long-term thinking required for geoeconomics is often lost in a world that is battered by various crises in quick succession, a point even more true of Pakistan and its four crises in four years:



- i. India-Pakistan Standoff of 2019,
- ii. COVID-19 Pandemic that began in 2020,
- iii. Fall of Kabul in 2021, and
- iv. Floods of 2022

In his view, Pakistan demonstrated remarkable resilience in each crisis: PAF's excellence in 2019; multistakeholder victory against the Coronavirus in 2020; sober management of the Kabul crisis in 2021. However, such constant firefighting had led a focus on the urgent rather than the important. Dr Chohan concluded that the world was going through a series of further crises, and it was important to find compassion and rational thinking in a shattering world to have geoeconomics, trade, cooperation, and integration take primacy again. Lastly, he asserted that it was in the hands of the new generation to make this world a better place, and cooperation was the way forward.

KEYNOTE ADDRESS:

Geoeconomics and the National Security Policy of Pakistan

Dr Moeed W. Yusuf stated that Pakistan's National Security Policy (NSP) broadened the definition of national security, with economic security at the core, and with geoeconomics as its subset. He believed that NSP's orientation towards economic security signified a major statement for the domestic audience, as well as for the world. Dr Yusuf observed that 'geoeconomics' had often been incorrectly used to convey competition among states, using the economic sphere to substitute for the strategic sphere. For Pakistan, he saw the concept as 'shifting the emphasis from using the country's location for geostrategic purposes to using it for geoeconomic purposes,' and not at the expense of geostrategy. He saw geoeconomics and geostrategy as two sides of the same coin, and lamented that Pakistan was nowhere where it needed to be in order to benefit from geoeconomics yet. Rather, it provided Pakistan with the direction and aspiration of where it should end up as a country, where the investment should go, and where productive time should be utilised.



Dr Yusuf then presented two pillars of geoeconomics: ‘connectivity’ and ‘development partnerships.’ For the first pillar ‘connectivity,’ he discussed the state of Pakistan’s five neighbours and concluded that only China was by far the most connected country with Pakistan, with CPEC being one of the cases in point, through which Pakistan had been receiving investment, and momentum had been generated in terms of infrastructure and energy, which are prerequisites for industrialisation and development. The speaker opined that Pakistan had to consider shifting the regional conversation from dependence to interdependence and making countries of the broader region interdependent with Pakistan’s economic fortunes.

Dr Yusuf contended that neutrality was not a choice for Pakistan as it was situated squarely in the middle of the three theatres of great power competition: the Asia-Pacific theatre, the Middle East theatre, and the US-Russia theatre (involving both Ukraine and Central Asia). Pakistan was geographically situated right in the middle of Afghanistan, Iran, and India which were the boundaries of these three theatres. Hence, to avoid becoming a proxy in this great power competition, the only way for Pakistan was to be proactive and find ways to become positively relevant and create such dependence of other countries on her that undermining the country becomes costly. He gave a few examples of how this might be possible, such as engagement with Central Asia, which had accelerated considerably in recent years, in terms of energy infrastructure and port connectivity. He said that creating such a model was the actual test and stressed that if Pakistan could create a model whereby China, Pakistan, the US, Afghanistan, and any other country could invest in connectivity



projects that benefit Afghanistan, Pakistan, or Central Asia, it would help Pakistan in bringing the temperature of the competition down in and around the region.

For the second pillar of geoeconomics (development partnerships), Dr Yusuf stated that space for development partnerships could be built around three elements: exports, Foreign Direct Investment (FDI), and remittances, all of which lead to non-debt raising foreign exchange. He highlighted a gap of USD 30 billion that had to be filled by leveraging these three forms of earning but lamented that Pakistan's investment climate (including ease of doing business elements such as legal contract enforcement) was not yet adequate to facilitate such development and needed to be improved to seize the opportunities of development partnerships.

Conclusion

Dr Yusuf concluded by emphasising that geoeconomics, as a subset of economic security, was the way forward for Pakistan. He surmised that economic security was the only way to secure Pakistan's strategic interests in the next 20 years. He further noted that the world would increasingly move toward economic nationalism, and restrictions, sanctions, and coercive measures in the economic and financial space would continue to increase. In these circumstances, Pakistan should find the space to build on its geoeconomic connectivity model and move from assistance to development partnerships. Lastly, Dr Yusuf advised that as a nation, Pakistan needed to start having three conversations immediately: (1) on the continuity of national priorities and policies; (2) public-private sector engagement; and (3) understanding the collective value of economics and security experts.



Geoeconomic Impact of Great Power Rivalry in the Asia-Pacific

Geoeconomics as a Lens

Dr Bērziņa-Čerenkova reflected on the question of whether geoeconomics was a good lens to look at the Asia-Pacific region, noting that the world was being structured increasingly by security architectures on all sides, with initiatives such as AUKUS, QUAD, NATO enlargement, China's new Global Security Initiative (GSI), and so on. She opined that today's discourse remained over-saturated with the security shorthand, and lauded the Air Force community of Pakistan for striving to introduce the economic dimension into this discourse. Moreover, she reiterated President of Pakistan's remarks that the US-China competition was expanding and Professor Yan Xuetong's declaration that China's ambitions were as strong as the US. However, she asserted that when China talked about bigger dreams, they would be economy-related, with the Belt and Road Initiative (BRI) being its classic example. In addition, she agreed that Ambassador Raphel that trade agreements and economic policy needed to be the linchpin of US policy. Hence, she believed that geoeconomics was the right lens to look at the Asia-Pacific region and was moving up on the policy planning agenda.



Lessons from Great Power Rivalry in the Asia-Pacific

According to Dr Bērziņa-Čerenkova, the first lesson that the great power rivalry in the Asia-Pacific had taught was that 'geoeconomics is not a deterrent.' There may be some partial deterrence from geoeconomics, but when strategies and ambitions trumped these arguments, it was not a deterrent. Second, the great power rivalry had taught that 'geoeconomics is not a tool exclusive to the neoliberal democratic order,' with their interdependent proponents since it was also effectively being used by countries



with strong state control. Third, she surmised that, at least in the Asia-Pacific region, ‘geo-economics is not an instrument of political change or systemic change.’

Geoeconomic Impact of Great Power Rivalry in the Asia-Pacific

The speaker argued that great power rivalry in the Asia-Pacific region would, first of all, contribute to the rise of solidified, centralised state actors who pursued specific goals. That should not, however, lead one to ignore the multiplicity of China’s actors, which included state enterprises, private capital, and province-level bureaucracy, etc. Nevertheless, she contended that a vision of centralised China did exist with a specific mindset behind it, suggesting that ‘in a contested environment, the country should consolidate for one goal that contributes to de-globalisation.’ Moreover, Dr Bērziņa-Čerenkova, stated that Western decoupling from China would happen and affect the region. However, decoupling was not an on-and-off switch, and it would not be a total decoupling as some industries would continue to see business as usual. However, this had already started affecting strategic and nearly strategic industries. She mentioned that the recent obliteration of the PRC’s semiconductor industry was a good example.

Conclusion

Dr Bērziņa-Čerenkova, was of the view that the US had a more robust ‘invest, align, compete’ strategy vis-a-vis China, while the European Union (EU) was taking a three-pronged approach which was questionable since it framed China as both a strategic competitor and rival but also as a partner. She added that, on the other side, great power rivalry provided space for small and middle powers to have agency and opportunity in this stable uncertainty through multilateralism, ad hoc cooperation, positive interdependency, and sub-national strategic decentralisation.

Geoeconomics and the New Asian Hemisphere

Globalisation: Past vs Present

Dr Karl J. Moore began with the argument that although globalisation was a historical process, present-day globalisation was different. Multinationals had existed in some form since at least the Assyrian empire, and continued today, even as the most successful ones now came from countries such as Canada, the US, Japan, and Korea. He remarked upon the echoes of history in terms of trade relations and deficits, as when Pliny the Elder complained about Rome's deficits with the Near and Far East, as indeed US presidents in recent decades complain about deficits with those same regions, albeit for different commodities.



Multiple Ways of Managing the Economy

Dr Moore drew upon the rich body of his earlier writings to surmise that there were multiple ways of managing successful economies. In the ancient world, there had been legionary-driven capitalism (Rome), enterprise-driven forms (Greek states), as well as temple-style capitalism (Assyria and Phoenicia). During the time when US President Clinton was promoting American-style capitalism, he shared that he studied various co-existing forms of capitalism that all offered strengths of their own, and he declared that the key determinants of the economic foundation in each national context should be culture, history, and social institutions. This was true for 21st Century geoeconomics as well since different countries could pursue different paths to arrive at comparable prosperity.

China: Consistently Important

Prof. Moore stated that China was the only country that had played a central role and was important throughout ancient, mediaeval, and even modern times. As such, according to him, it mattered that China was so important because history mattered. In Canada and the US, there was a tendency not to bother about history, but while discussing China, history mattered to a considerable degree, and there was also some interesting research



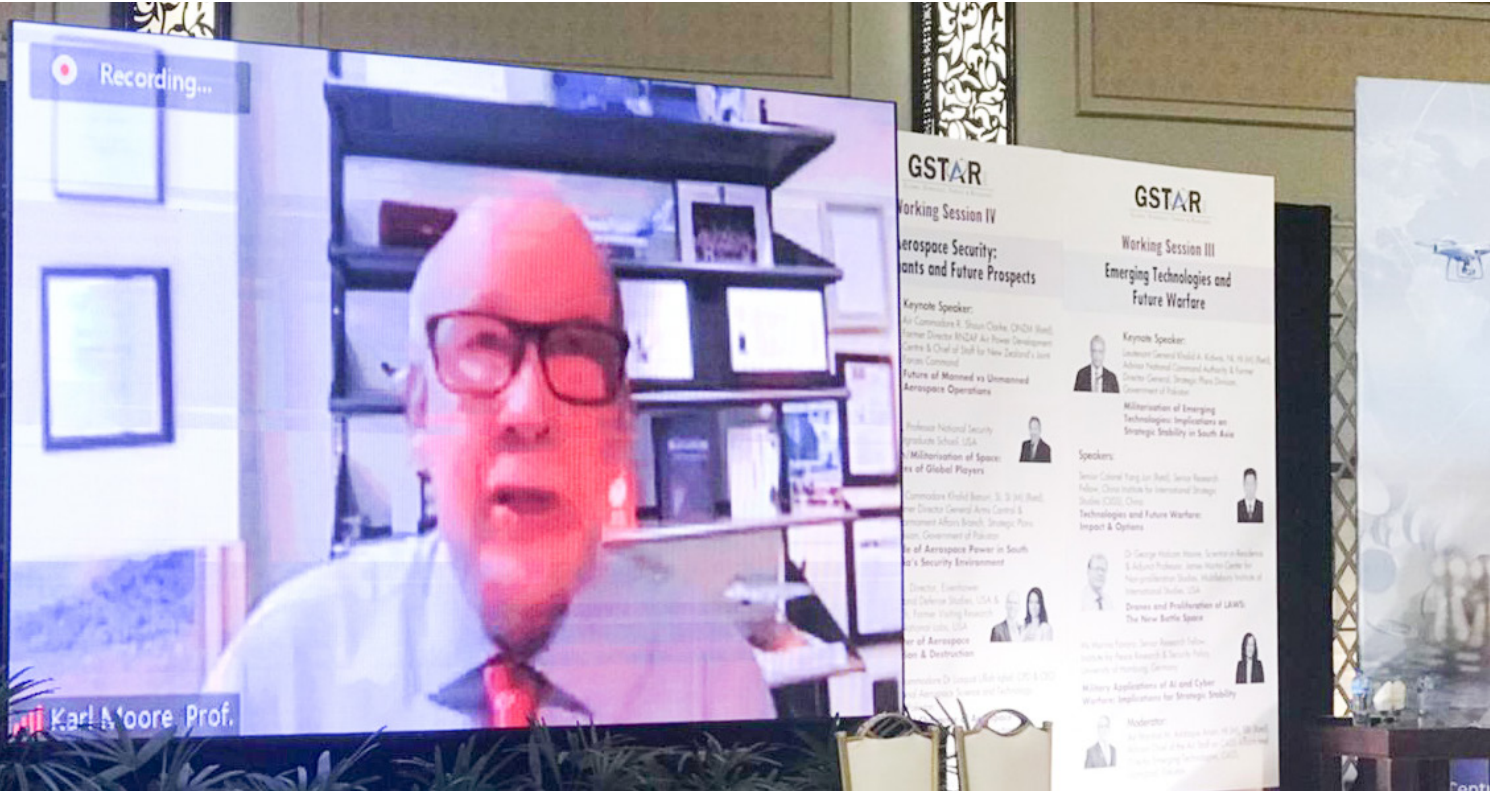
looking at Chinese history textbooks in that regard. He noted that Chinese students in high schools, colleges, and universities were taught a uniquely Chinese view of the world, and that one must learn from this view in order to interact and engage with the country. He opined that Pakistan was fortunate in that sense since it had a much better view of China than the West due to its proximity to the country.

Regionalisation: Key Characteristic of the Contemporary World

Dr Moore had long observed that regionalisation had a great potency for shaping geoeconomic prosperity, even when globalisation was perceived as the dominant path for development, having written on the subject even when it was seen as an unusual view. Although globalisation had pressed ahead for a number of years, the COVID-19 pandemic had accelerated and led to a shift towards a more regionalised geoeconomics approach. Therefore, it was important for countries like Canada and Pakistan to recognise that regions mattered, and the pandemic increased their relevance further. This was certainly true in the North American context, from where Dr Moore spoke, and he pointed out that the fragility of globalisation meant that the world was more focused on regionalisation.

Youth defining the Future

The speaker referred to his most recent book entitled ‘OK Boomer: Working Better with Millennials and Generation Z,’ in which he argued that people over 40 had been taught a modern worldview in universities, while people under 30 with a university degree had been taught a postmodern worldview, making them different from their predecessors. The postmodern sensibility constituted a rejection of the modern worldview, which was seen by Gen Y and Z as having failed, given its notions of scientific prominence, the march of progress, and the decline of organised religions. Dr Moore noted that instead such



belief systems remained relevant throughout the world. Postmodernism also envisaged a decline in hierarchy, but not the death of hierarchy, at least in the West. This emerged, according to him, from big topics of society such as the nature of Truth (capitalised) and on who owned this absolute Truth. He surmised that Truth still existed, but with less of that absolutism. Part of the truth had shifted from older people to younger ones in postmodernism.

Conclusion

At the end, Dr Moore stressed the need to listen to the younger generation and their ideas more. In this context, he referred to the Western idea of reverse mentoring. He was of the view that the younger generation had played and should continue to play an important role in mentoring the older generation as they had better knowledge of technology, social media, and other novel elements. He, therefore, argued that thoughts of the new generation needed to be taken on board, and that young people were the future, even as the older generation had a central role to play as their mentors.

Peaceful Regional Connectivity and Prosperity

East Asia: Exemplar of Peaceful Regional Connectivity and Prosperity

According to **Dr Wang Wen**, ‘peaceful regional connectivity and prosperity’ was encapsulated in the development of East Asia over the past 40 years, especially since the end of the Cold War. In East Asia, with a population of more than two billion, there had been no foreign war or military conflict, and countries had resolved all diplomatic frictions with diplomatic wisdom. Such a vast peace was exceedingly rare in world history, and both peace and connectivity had made East Asia the most prosperous region in the world

over these years. During this period, cross-border interconnection of transportation, trade, and investment had surpassed all countries. He also mentioned that the total international trade of East Asian countries accounted for 40 percent of the world's total trade.

Dr Wen envisaged that with the advancement of the '10+3', RCEP, and the China-Japan-Korea Free Trade Area negotiations, the trade strength of East Asian countries would continue to increase. Meanwhile, the growth of foreign investment in East Asian countries was the fastest in the world, and the region's economic growth (including the digital economy), was the fastest in the world, while public security was world-class.

Given these factors, the speaker remarked that the future belonged to East Asia. He provided three major reasons for the prosperity of the region:

- i. stable and continuous domestic policy;
- ii. independent security policy; and
- iii. public value-creating social policies.

Stable and continuous policies were centred on economic growth and construction, maintenance of social stability, and enhancement of investment in infrastructure, along with open-door policies to attract capital, tourists, and technology from all over the world. He shared that the independent security policy included maintaining vigilance against the US' military involvement in spite of historical contradictions between the regional



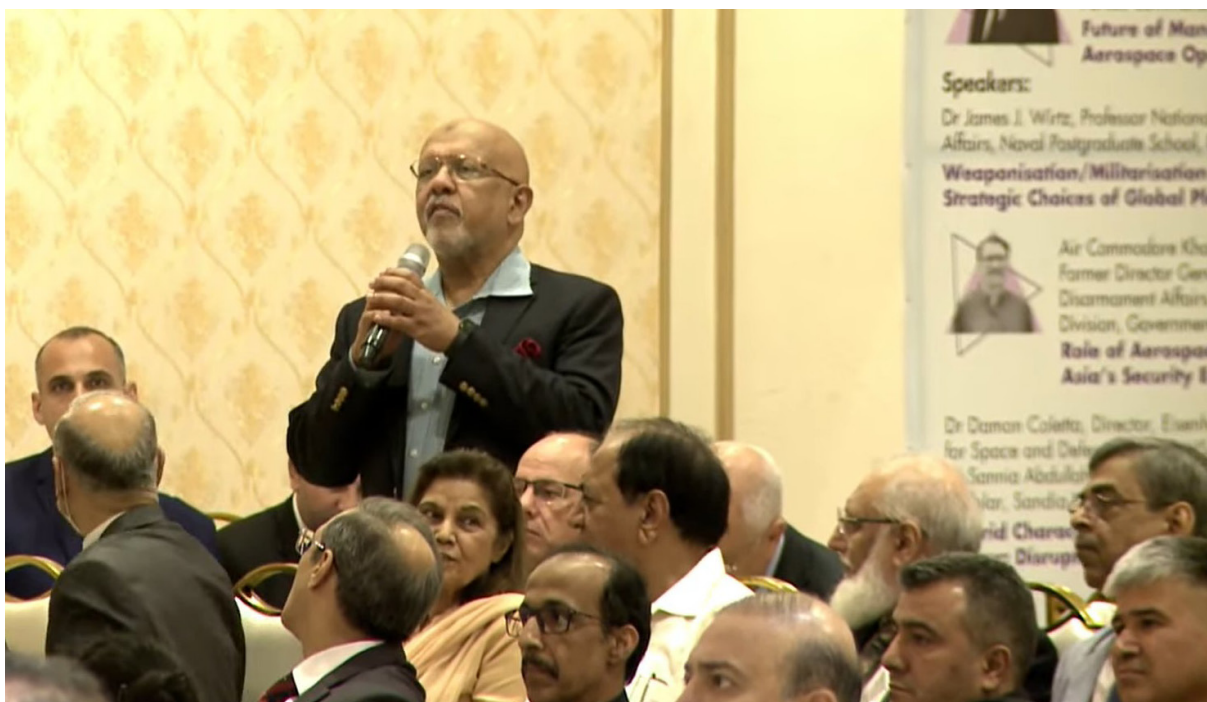
countries, who instead tended to negotiate the resolution of frictions and conflicts within the region, given the belief that US involvement in East Asia would lead to wars in the region, as had had been the case elsewhere in the world. Public value-creating social policies involved a commitment to poverty reduction, public security, and equalisation of basic services. The results of this, Dr Wen observed, were clear: over the past 30 years, East Asian countries accounted for 80 percent of global poverty reduction, while using intelligent technology to innovate urban governance, crack down on crime, and maintain social stability and unity. Hence, the chronic ailment of so-called ‘divided societies’ in many countries was relatively mild in East Asia.

East Asia: Role Model for the World

Dr Wen observed that the world had paid excessive attention to the experience of the US in the past, and it was now necessary for the world to pay attention to, synthesise, and draw lessons from the experience of East Asia, including that of China. The economic, security and social policies of East Asian countries shared a certain commonality and were worthy of discovery by the world. He was also of the view that the prosperity and stability of East Asia was affecting and driving the surrounding areas, such as South Asia, Central Asia, and the Russian Far East, and maintaining more cooperation with East Asia was a new driving force for the sustainable development of these regions. However, Dr Wen noted that there were always forces trying to undermine and contain East Asia’s prosperity and stability. Referring to the US, he mentioned that this force had now suppressed the rise of Russia by provoking war in Ukraine, while suppressing European prosperity.

Factors of Instability in East Asia

According to Dr Wen, maintaining peaceful regional connectivity and prosperity in East Asia was, however, not easy. He mentioned four major factors of instability in the region from the perspective of the next ten years:



- i. Taiwan Strait issue,
- ii. North Korean nuclear issue,
- iii. South China Sea issue, and,
- iv. Sino-India border issue.

He also pointed to Sino-Japan and Japan-Korea's perennial issues. However, he was optimistic that the East Asian countries would resolve these amicably, and foreign interference was not required. Dr Wen cautioned that interference was particularly ill-advised in the US' offshore balancing strategy when global inflation and economic crises loomed so large for the world, including the US, Europe, and East Asia.

Conclusion

In conclusion, Dr Wen stated that for more than 30 years, American politicians, think tanks and the media had all been talking about the Chinese threat. However, China had not started any war, nor had a financial crisis, or become a source of refugees, nor had a military conflict with its neighbours or exported its economic crisis to other countries. In comparison, the US launched or provoked the war in Afghanistan, Iraq, Libya, Syria, and Ukraine, among others. He stated that in the US National Security Strategy Report, which was recently released, the US once again regarded China as its biggest strategic competitor. However, China was reluctant to have a new Cold War with the US and did not regard the latter as a strategic competitor. Instead, it hoped to co-exist peacefully, with mutual respect and joint contribution to the world's development.

In China's view, even if there was competition with the US in the future, there should also be a competition for who was being more responsible and contributing to the world. He further stated that the practice of the past 40 years had proven that China was the stable anchor of East Asia's security and prosperity. As long as China continued to develop and maintain security and stability, it was impossible for East Asia to become chaotic. China would continue to maintain its role as a stable anchor in the future. Lastly, Dr Wen asserted that there was a need to re-define the discourse, order of thought, especially perceptions about East Asia. There was 'a need to re-observe East Asia, re-understand China, and re-understand the future,' he declared.





Working Session III

Emerging Technologies & Future Warfare

20 October 2022



Working Session III

Emerging Technologies & Future Warfare



Keynote Speaker:

Lieutenant General Khalid A. Kidwai, NI, HI(M) (Retd), Advisor National Command Authority & Former Director General, Strategic Plans Division, Government of Pakistan

Speakers:

Senior Colonel Yang Jun (Retd), Senior Research Fellow, China Institute for International Strategic Studies (CIISS), China



Dr George Malcom Moore, Scientist-in-Residence & Adjunct Professor, James Martin Center for Non-proliferation Studies, Middlebury Institute of International Studies, USA

Ms Marina Favaro, Senior Research Fellow, Institute for Peace Research & Security Policy, University of Hamburg, Germany



Moderator:

Air Marshal M. Ashfaque Arain, HI(M), SBt (Retd), Advisor Chief of the Air Staff on CASS Affairs and Director Emerging Technologies, Centre for Aerospace & Security Studies, Islamabad, Pakistan

Introducing the theme, the session moderator **Air Marshal Ashfaque Arain (Retd)**, shared how emerging technologies such as Artificial Intelligence (AI), Directed Energy (DE), cyber, space, quantum computing and biotechnologies etc. were affecting all facets of modern life, including health, agriculture, education, businesses and improving overall economy of countries. Like all other technologies, when used in military applications, these had the potential for unprecedented destruction and devastation. According to him, these technologies, in addition to changing the quantum and speed of destruction, were also impacting the character and nature of destruction during war. They were also capable of



creating response dilemma for national and military leadership, leading to uncertainties and unpredictable responses. Air Marshal Arain cautioned that with their kinetic and non-kinetic disruptive capabilities, convergence of these technologies would also create serious challenges, necessitating better understanding of their combined effects on nuclear thresholds, strategic stability and potentially uncontrollable escalation. He further added that while many existing technologies were not fully covered by existing laws, new technologies were developing at a pace faster than nations were working to develop legal frameworks. In his view, these technologies could, therefore, upset the existing value system and frameworks upon which the authenticity of current social and international order was dependent.

KEYNOTE ADDRESS:

Militarisation of Emerging Technologies: Implications on Strategic Stability in South Asia

Discussing emerging technologies, **Lieutenant General Khalid A. Kidwai (Retd)** commented that while the term ‘emerging technologies’ had managed to catch the imagination and attention of military professionals as some new and exotic term of our times, historically, technologies and technological developments in any given era were always dynamic, progressive, and generated profound strategic effects on the strategic



stability-instability paradigm in that particular era, time, place, and region. According to him, science and technology were, by their very nature, progressive, innovative, and a marvel, therefore, new technologies never stopped emerging.

Counter-technologies and Antidotes

Lieutenant General Kidwai added that exotic technologies like robotics, Artificial Intelligence (AI), Directed Energy Weapons, hypersonic weapons, cyber warfare, space capabilities, drones etc. conjured a vision of a Star Wars like intergalactic warfare from faraway distances, with a faceless adversary neither being seen nor pinpointed for possible retribution and retaliation. The Keynote Speaker predicted with certainty that in the next 10-20 years, emerging technologies of today, viewed and debated with such awe, would probably pale into lesser significance with the introduction of even more innovative technological marvels. In his view, strategists, antagonists, scientists, and engineers in each era invariably found antidotes and effective counters to the emerging technologies of their respective times. Be it archery, cavalry, artillery, fighter airplane, tank, missile, submarine, means of communications, lasers, satellites, or even nuclear weapons, science and technology invariably provided near-simultaneously a counter to the particular emerging technology of the day. He underscored the historical reality that the destabilising impact on strategic stability vis-à-vis technological developments was always countered via counter-technology or antidote that re-established strategic stability.



Emerging Technologies in South Asian Context

Examining the effects of emerging technologies in the South Asian context vis-à-vis India and Pakistan, Lieutenant General Kidwai recalled the effects of induction of the previous emerging and state-of-the-art technologies, including aircraft, missiles, air defence systems, submarines etc. culminating in the development of nuclear weapons supported by ballistic and cruise missiles on strategic stability in South Asia. These technologies played their role for a specific time on the South Asian strategic scene, till the other side

caught up by finding an antidote of an equal, and opposite technology to restore the disturbed strategic balance.

Impact of Emerging Technologies on Warfighting

Lieutenant General Kidwai asserted that with the availability of ever-evolving exotic technologies, strategists and practitioners of war would continue to make adjustments and introduce innovation in deterrence strategies, warfighting techniques, tactics, doctrines, and strategies. Referring to the past, he added that some technologies developed for civil applications would continue to be adopted to serve the purposes of kinetic or non-kinetic warfare. Additionally, strategists and practitioners of war would continue to demand a certain type or category of technology to be developed through focused R&D to meet the ends of strategies. He added that cooperative and corporate interests of governments, military-industrial complexes, military strategists and practitioners, think tanks, scientists and engineers of various shades perpetuated a common vested interest.



Destabilising Impact of Emerging Technologies on South Asia

Discussing the impact of some of the emerging technologies threatening to destabilise South Asia, the speaker stressed that their induction into the warfighting machines of India and Pakistan, could lead to their incorporation into a variety of weapon systems, including the instruments of Fifth Generation and hybrid wars. Those could include kinetic or non-kinetic systems capable of disruption of the adversary's military defences, or civilian way of life, based on AI, robotics, Directed Energy Weapons, cyber domains, speed technologies for missiles like hypersonic missiles, drones, and ever expanding horizons of the BVR missiles etc. He cautioned that if practiced with abandon, by either India or Pakistan, sensing a perceived technological advantage would certainly destabilise South Asia and could trigger a sequence of uncontrollable events, noting the possession of a wide variety of nuclear weapons in the form of established triads by both states. He cautioned that an 'Armageddon' could well start with a relatively low-level first rung spark but could climb rapidly on a escalatory ladder with catastrophic consequences not only for the two antagonists, but for the wider region with global effects.

India's Pursuit of Emerging Technologies

According to Lieutenant General Khalid A. Kidwai, India's weapons and high technology acquisition policies, through the West, could invariably target the strategic stability of

South Asia, whether the technologies were inducted from the West or indigenously developed. The resultant strategic instability and the strategic effects that these generated on Pakistan's security were not taken into account in the Western calculus. He stressed that the Western focus on containment of China, and Western and Indian politico-strategic interests, converged conveniently in the areas of defence and technology cooperation.

Indian Exceptionalism

The speaker referred to Indian exceptionalism as seen in exemption from the Nuclear Suppliers Group (NSG); acceptance of violations of Missile Technology Control Regime (MTCR) range limits of cruise missiles; and acceptance of human rights violations bordering on genocide in Indian Illegally Occupied Jammu and Kashmir in the hope of inducting India into the Western policies of Chinese containment. He added that India had repeatedly demonstrated that it would not oblige the West in payback when it came to her own national interests. He cited strong Indian ties with Russia due to its heavy dependence on Russian military inventory, lack of any meaningful obligations and commitments vis-à-vis rise of China, and playing on both sides of the fence in the Ukraine Crisis to support his argument.

Pakistan's Geopolitical Dilemma

Lieutenant General Kidwai explained that owing to Pakistan's geopolitical dilemma, via the destabilising effects on the delicately balanced South Asian strategic stability paradigm with the induction of various emerging technologies in the Indian armoury, Pakistan was invariably left to fend for itself. He was, however, optimistic that the challenges posed by emerging technologies would be fully met in the future as history was witness that Pakistan had always succeeded in correcting imbalances and found appropriate solutions to its security concerns.



Conclusion

While nuclearisation of South Asia had ensured outlawing of large-scale kinetic wars, where strategic deterrence worked to Pakistan's relative advantage, the state as a robust nuclear power with a strong military-industrial infrastructure was quite capable of ensuring a stabilising reaction to every destabilising Indian action. In conclusion, he asserted that Pakistan's national security was sacrosanct and would never be left at the mercy and vagaries of international geopolitical weather and technologically created imbalances.



Technologies and Future Warfare: Impact & Options

Contemporary Military Technologies and Future Warfare

Senior Colonel Yang Jun (Retd) highlighted that technologies were improving at a rapid pace and there were major breakthroughs in the research and development of disruptive technologies, and remarkable boost in the operational effectiveness of weapons and equipment.

Trends in Military Technologies

While highlighting the trends in military technologies, Senior Colonel Jun pointed out that cyber and information technologies could be game-changing for future warfare as these were widely used for military purposes like information acquisition, data transmission, intelligence support, information services etc. However, there was absence of international laws and regulations governing cyber warfare.

The Chinese speaker shared that on the disruptive technologies front, states were developing Directed Energy Weapons (DEWs), hypersonic missiles and quantum computers. DEWs could hit the target instantaneously, and attack multiple targets successively in a short time with little collateral damage. Hypersonic weapons, with speed of over 20 Mach, could deliver a global strike within an hour, which was almost unstoppable. Quantum computers would enable secure quantum communications, quantum radars, and quantum positioning.

Senior Colonel Jun further elaborated that rapid advancements in AI would increase the operational tempo to an extent that the human brain would not be able to cope with the rapidly changing battlefield, resulting in delegation of most decisions to intelligent machines. In the future, he foresaw AI playing an increasingly important role in intelligent sensing and information processing, intelligent command & control and aided



decision-making, unmanned military platforms, bionic robots, and human function augmentation etc.

According to his analysis, space-based technologies were also critical as major power rivalry in space had become an important part of the ongoing military struggle. Countries were competing in satellite reconnaissance, space-based anti-missiles, satellite communications, data-based decision-making, traffic management, and on-orbit services. Growth of commercial technologies had also promoted the development of space technologies for military use. Low-orbit satellite constellation technologies, represented by 'Starlink,' were becoming the mainstream solution to low-latency global communications. He stressed that these had great potential in future battlefield communications, intelligence, surveillance and reconnaissance, and anti-missile interception, etc.

Senior Colonel Jun pointed out that biotechnology had also infiltrated the military field since its inception, and was constantly being integrated with information technology, material technology and manufacturing technology. He stressed that the development of biotechnology for military use would give rise to new combat modes and concepts.

Technologies' Influence on Future Warfare

Discussing the influence of technologies on future warfare, Senior Colonel Yang Jun highlighted that it had three stages, i.e., intervention, support, and dominance, and currently, it was transitioning from the intervention to support phase. Once it entered the dominance stage, the traditional forms of war would completely change. He cautioned that with increasing application of IT in the military field, major military powers in the world were competing for 'IT superiority.' In future warfare, 'IT superiority' would become the core component of military superiority – without it, established superiority in other dimensions could be short-lived.

On IT-based warfare, the speaker added that it was being manifested in network-centric warfare, where connectivity and information were the core and decisive strength. On the other hand, intelligent warfare was cognition-centric warfare, with 'computing' being the core capacity. In such warfare, intelligence was the dominant strength compared to firepower, mobility and information power.

Senior Colonel Yang Jun highlighted that future warfare would involve hybrid-manned and unmanned-operations as basic modes of operations. The rapid development of intelligence would grant the Command and Control system advanced and full-fledged decision-making capability, and gradually realise 'human-out-of-the-loop' operation. He added that intelligent weapons were distinct from other weapons because of their strong self-learning and self-growing abilities. With the accumulation of operational



experience, they would continue to learn, improve, and effectively integrate the methods to deal with different battlefield conditions, thus, generating 'intelligent combat effectiveness'.

According to him, intelligent combat methods like algorithmic warfare, swarm warfare, and instant warfare were emerging. These new modes of war would impact multiple dimensions including land, sea, air, space, electromagnetic space and cyberspace, and fully unleash the physical advantages in terms of speed, height, and power. Senior Colonel Yang Jun predicted that with the support of advanced decision-making and control technologies, the organisational structure of military forces would become more modular, flexible, and multifunctional.

Influence of New Technologies on Military Theories

While discussing the influence of new technologies on military theories, Senior Colonel Jun highlighted that countries were constantly adjusting their strategies and strengthening their military force build-up. Theories of network-centric warfare and cognition-centric warfare highlighted the importance of information superiority and advocated that various systems may be formed into a network information system. Through man-machine



integration, real-time sensing of battlefield situation could be realised and transformed into advantages in terms of decision-making and actions – leading to victory.

The speaker remarked that theories such as ‘Strategic Paralysis’ stressed on combining ‘soft means,’ to break the enemy’s will, with the ‘hard means,’ that destroy the enemy’s military forces or key facilities, so as to achieve tactical and operational goals like ‘physical-mental double strike’ or ‘COG-node double strike’.

In his view, many countries had realised that information operations were one of the most effective and could quietly plunge a country into chaos. Countries were drawing on the merits of traditional warfare and asymmetric warfare that played to their strength. Relatively backward countries and non-state actors were actively developing asymmetric warfare theories and methods, like ‘Unrestricted Warfare’ theory, that played to their strengths while avoiding weaknesses.

Conclusion

Senior Colonel Yang Jun concluded that rapid development and application of new technologies had accelerated the evolution of various forms of war – to be more IT-based and intelligent. The space, field, and dimensions of military activities were expanding day by day, putting forward higher requirements for systematic, quantified and engineering-based military theories. He asserted that future warfare could only be won by grasping the laws and characteristics of modern warfare; out-of-the-box thinking; taking into consideration systems, data and algorithms; exploring new operational concepts; designing new winning mechanisms; strengthening the integration of warfighting and technological development.

Drones and Proliferation of LAWS: The New Battle Space

Drones and Proliferation of LAWS

Dr George Malcom Moore discussed the evolution and proliferation of drones and peculiar challenges related to bigger drones like the US Reaper, and the smaller Chinese drones like DJI Phantom. He informed that the generic term ‘drones’ was new and covered a

lot of uncrewed vehicles which could operate in air, land, under and on the water, and in any combination thereof. However, his talk only focused on uncrewed aerial vehicles, and he restricted the discussion of Lethal Autonomous Weapon Systems (LAWS) to these systems only. Citing the examples of BQM-34s employed in Vietnam War and US' drone anti-submarine helicopters, the speaker asserted that drones were not a new concept – even though their ramifications were new.

Contemporary Developments

Dr Moore highlighted that while the concept was not new, there had been remarkable progress in terms of technology, e.g., miniaturisation, computers, control units, and communication systems. With satellite communication, drones could be controlled from far-off distances. Navigational position systems had also improved and GPS, GLONASS, BeiDou, and Galileo could all be used together. Reportedly, the Russians had improved the accuracy of the Iranian drones by shifting them over to GLONASS. Additionally, AI was another enabler being incorporated in newer, smaller, and more powerful computers.

According to Dr Moore's assessment, drones posed a different nature of threat in the civilian domain as was demonstrated by Green Peace when they crashed a drone into a reactor containment vessel of a French civilian nuclear power plant (to expose nuclear security vulnerabilities). Moreover, he predicted that the role of drones in the ongoing Ukraine War could become a trigger for an arms race among various states.

Discussing the US military, he shared that it categorised drones into five categories based on attributes like weight, operating altitudes, or speeds. The lower-end of these groups were handheld and launched drones that could be sent ahead for surveillance (e.g., RQ-11



Raven, WASP III, TACNAV). The higher end drones, like the Global Hawk were, in Dr Moore's analysis, more capable with extraordinary range, speed and the option of being truly autonomous, capable of performing every aspect of an assigned mission independently.

He pointed out that the US operations of Predator and Reaper, around the world, were marred with questions over their legality, collateral damage, discrimination, and proportionality. In his view, the ability to discriminate, protecting civilians from being casualties, had worked well – with notable exceptions. He added that the drone operators lived a strange existence where they would be part of the active war zone for some time of the day and returned to their families for the rest – leading to Post-Traumatic Stress Disorder (PTSD). The other controversial issue was whether the operators were from the military, intelligence agencies, or other systems. In the US, there had been a split between the military and the CIA, he shared.

Dr Moore opined that the drones' ability to swarm, by virtue of communication amongst them and acting in concert, was unique and was considered quite a threat as it provided an asymmetrical advantage over other types of military operations.

Drones and the Ukraine War

Drawing lessons from the Ukraine War, Dr Moore opined that use of Bayraktar TB-2 Turkish drones by Ukraine in the ongoing war had challenged the largely held understanding that drones, being slow in speed and lacking defensive capabilities, could only operate successfully in lightly or undefended areas. He predicted that the outcome of the war would push a lot of militaries around the world to increase the offensive and defensive capabilities of drones.





Dr Moore asserted that the frequently referred suicide drones such as Shahed, more of loitering munitions and essentially LAWS as they flew, sought their target using independent radars or pre-fed geo-ref position, and engaged the target, thus, were frequently referred as Kamikaze drones. These were fire-and-forget type systems which could also be used to saturate enemy defences. On the contrary, drones like Reaper, Predator, and even Bayraktar, had man-in-the-loop.

Global Players

Prof. Moore highlighted that while the US was a large producer, all major powers like France, Turkey, and China, were producing and selling drones. Israel, for many years, had been a major manufacturer of military drones. Pakistan also produced Burraq drones.

International Legal Framework

Presently, there were no conventions or agreements about drones, but in Dr Moore's analysis, this could gain attention in a post-Ukraine war environment – if US and Russia engaged in negotiations. Though with a slight impact, the only mechanism regulating drones was the Missile Technology Control Regime (MTCR) with the only consideration being range and payload as it was considered a poor man's cruise missile. While the US and few other countries were exercising export controls on some aspects of drone technology, there were no strong export controls. This could also be revisited in the post-Ukraine environment.

Future Course of Evolution

According to Prof. Moore, there was possibility of an increased focus on small drones in the future as previously, no one had considered viable military use of such systems. They were extensively used for surveillance, targeting, directing artillery strikes, and spotting as their slow speed and low radar aspect avoided detection by search or fire control radars of AD systems and AAA and interception by manned aircraft. All these countermeasures became particularly ineffective against the drones that had impact-detonating warheads. He further added that after the Zaporizhzhia Nuclear Power Plant radiation leak possibility, the International Atomic Energy Agency (IAEA) had been encouraging the development of radiation monitoring with drones.

Conclusion

In his concluding remarks, Dr Moore opined that the Ukraine experience could increase military use of drones and restructuring of the military drone defence capabilities with further improvements in their capabilities. Future drones would have higher speeds and better performance with AI integration. Alongside high-end drones, low-end drones would also have significant improvements resulting in their wider adoption. He also pointed towards the possibility of efforts to control drone proliferation and addressing the issue of lethal autonomy. These regulations could be informed by human rights legislations and the issues of discrimination.

Military Applications of AI and Cyber Warfare: Implications for Strategic Stability

Ms Marina Favaro's talk revolved around her recent study titled 'Negative Multiplicity: Forecasting the Future Impact of Emerging Technologies on International Stability and Human Security,' which was a technology-mapping exercise to forecast future impacts of emerging technologies on strategic stability and human security. According to the speaker, these technologies could individually or collectively impact international peace and security to a degree that was worth evaluating. She also offered a working definition of emerging technologies, according to which, emerging technologies were those technologies, scientific discoveries, and technological applications that had not yet reached maturity or were not yet widely in use, but were anticipated to have a major – perhaps disruptive – effect on international peace and security.

Military Applications of AI

Ms Favaro informed that for the purpose of her study, 30 international experts were asked to forecast the developmental trajectories of 12 emerging technologies in US, Russia, and China until 2040. The technologies included AI for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance





(C4ISR); AI for weapons and effects; AI for cyber operations; AI for information warfare; Quantum for hardening and exploiting systems; Quantum for C4ISR; Anti-satellite (ASAT) capabilities; Hypersonic weapon systems; DEWs; Physical Human Enhancement Technologies (HET); Cognitive HET; and Synthetic Biology. The experts were also asked to score the possible future impact on arms race stability, crisis stability, and humanitarian principles. Various analysis techniques, which included machine learning, were used to analyse this data. She listed three high-level takeaways from the study which were as follows:

a) Negative Multiplicity

The first key takeaway of the study was that the data revealed negative multiplicity. The impact of these technologies was expected to be negative overall, with some technologies negatively affecting all three of the dependent variables – arms race stability, crisis stability, and humanitarian principles. Speaking on the extent to which each technology might strengthen strategic stability and human security or weaken it, Ms Favaro commented that experts thought that half of the technologies would predominantly weaken them, and the net impact of all the technologies was negative. No technology was anticipated to strengthen arms race stability, crisis stability, and humanitarian principles. Moreover, the technologies that were seen as most negatively impactful towards arms race stability featured a lot of AI technologies. The speaker disclosed that AI for information warfare showed uniquely negative impacts, particularly for crisis stability and arms race stability. However, she underlined two technologies expected to strengthen two of the three dependent variables. AI for C4ISR was expected to strengthen arms race stability and crisis stability more than it weakened it. Similarly, Quantum for C4ISR was expected to strengthen crisis stability and humanitarian principles more than it weakened them. Ms Favaro further added that AI and Quantum Technologies for C4ISR were expected to have the most positive effects of any of the examined technologies given that they had the ability to increase clarity and situational awareness, thereby, increasing strategic stability.



b) Ambiguity of Impact vis-à-vis Technical Characteristics

On the impact of these technologies, Ms Favaro shared that her study found that those did not always mirror their technical characteristics. She referred to the finding that not all AI technologies were clustered together when K-means clustering was employed to use the scores given by experts and find meaningful groups of technologies that were scored similarly as per their impact characteristics.

Ms Favaro posited that AI showed an interesting trend. Three of the four AI technologies were clustered together, which included AI for cyber operations, AI for C4ISR, and AI for weapons and effects. This suggested that the way experts scored these technologies was quite similar. Conversely, the fourth and final AI technology, AI for information warfare, was clustered in another group with anti-satellite capabilities, hypersonic weapon systems, and DEWs. The speaker opined that this was an interesting finding because that technology did not exhibit the same kind of technical characteristics within that group. She added that this cluster, which included anti-satellite capabilities, hypersonic weapon systems, and DEWs, was the most negatively impactful cluster on crisis stability and that was what tied them together in the eyes of experts. This suggested that the same enabling technology did not ensure the same type of impact on strategic stability.

c) Rising Great Power Competition

Ms Favaro warned that a nascent technological arms race was picking up given the expected alignment of technological trajectories from the US, Russia, and China. This arms race threatened to seriously impede international arms control efforts to regulate these technologies. She highlighted that all 12 technologies were anticipated by experts to be available for deployment by 2040 in all three countries. By this point, all these technologies would be in the technology readiness level band and were expected to be available for battlefield use. Ms Favaro stressed that R&D in hypersonic and DEW was showing a meteoric rise in the US, which signified a forthcoming arms race. She explained that all three states were neck and neck, according to the experts in her study, in terms of the pace of development. She further emphasised that great power competition would be the main driver behind future R&D in the states under consideration.

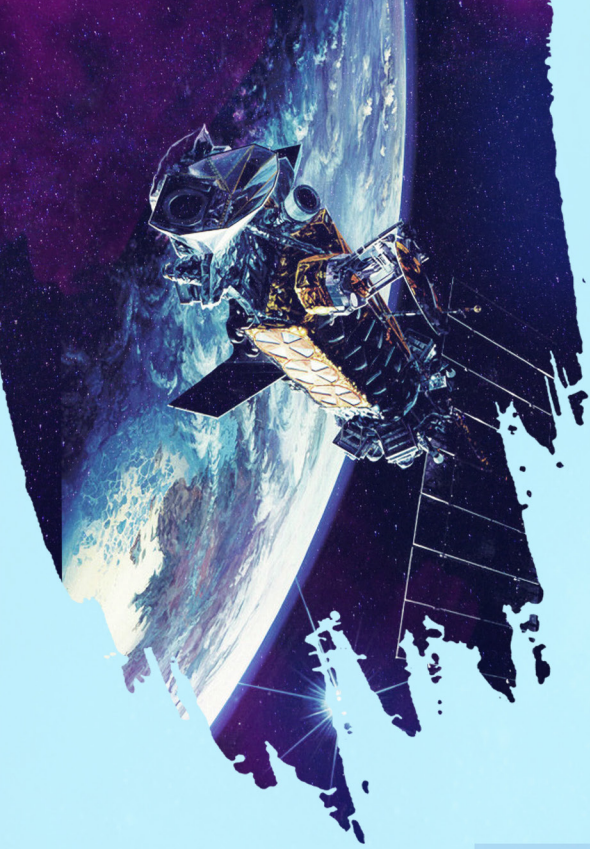
Conclusion

In her concluding remarks, Ms Favaro pointed to the following broader policy implications:

- The study underscored the negative environment created by geopolitical tensions.
- Experts perceived that the arms race for emerging technologies between the US, Russia, and China was already underway.
- There was uncertainty surrounding Russia's technological trajectory, particularly given the sanctions imposed on the country after its renewed attacks on Ukraine.
- The findings anticipated significant difficulties in the context of arms control, particularly the negative environment created by geopolitical competition and the alignment of the great powers' technological trajectories.

Arms control may seem more attractive when adversaries narrow the competitive gap and were dealing with peer competitors.





Working Session IV

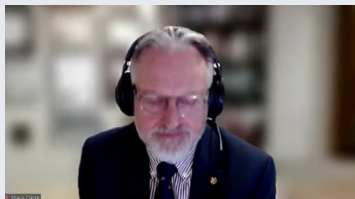
Aerospace Security: Determinants and Future Prospects

20 October 2022



Working Session IV

Aerospace Security: Determinants and Future Prospects



Keynote Speaker:

Air Commodore R. Shaun Clarke, ONZM (Retd), Former Director RNZAF Air Power Development Centre & Chief of Staff for New Zealand's Joint Forces Command

Speakers:

Dr James J. Wirtz, Professor National Security Affairs, Naval Postgraduate School, USA

Dr Damon Coletta, Director, Eisenhower Center for Space and Defense Studies, USA

Dr Sannia Abdullah Close, Former Visiting Research Scholar, Sandia National Labs, USA

Air Commodore Khalid Banuri, SI, SI(M) (Retd), Former Director General Arms Control & Disarmament Affairs Branch, Strategic Plans Division, Government of Pakistan

Air Commodore Dr Liaquat Ullah Iqbal, SI(M), CPD & CEO National Aerospace Science and Technology Park, Pakistan

Moderator:

Air Commodore Dr Zia Ul Haque Shamsi, SI(M) (Retd), Director (Peace & Conflict Studies), Centre for Aerospace & Security Studies, Islamabad, Pakistan

Outlining the main context of the session's theme, the moderator **Air Commodore Dr Zia Ul Haque Shamsi (Retd)** explained how rapid technological advancements had resulted in integration of air power and space power, commonly called 'Aerospace Power' to support attainment of national objectives. With continued evolution of technologies, threats and air and space theories, aerospace power was also continuously undergoing refinements. Despite being a relatively new concept, it had become a very important

component for ensuring national security and economic development. According to Dr Zia, militarisation of space had added yet another dimension to aerospace power. Therefore, for optimal utilisation of this capability, leadership at all levels needed to understand its theory, principles, and applications. He asserted that while the debate continued on the



legal, moral, and ethical aspects of militarisation of space, in reality, space as a medium or enabler, had already been politicised and to some extent militarised. However, while most advanced states had already established their Space Commands, the technologically dependent nations were lagging in both, air power and space technologies. Owing to technology control regimes, developing nations needed to work towards collaborative and indigenous development to accrue benefits.

KEYNOTE ADDRESS:

Future of Manned vs Unmanned Aerospace Operations

Delivering his Keynote Address, **Air Commodore R. Shaun Clarke** outlined certain distinct characteristics of unmanned aerospace operations:

- i. inevitability of a totally unmanned autonomous aerospace future,
- ii. profound significance and implications of evolving autonomous air, and the
- iii. current state and likely immediate future of autonomy.



Unmanned Aircraft: Definitional Overview

Air Commodore Clarke considered 'unmanned aircraft' to exist on a continuum from low-order autonomous air, i.e., automated systems such as Beyond Visual Range (BVR) weapons straight to semi and supervised autonomy where the human either issues permissions or interventions right through to futuristic self-determining machines with a high-level human intelligence which were yet to be invented. He was of the opinion that what was currently experienced as 'Autonomous Air' largely involved doing the old job with the new technology. Platforms on missions that had been pre-programmed or



actively or intermittently steering through the sky to execute air tasks. What, in his view, was a real prospect on this continuum was advanced Artificial Intelligence leading to weapons of self-determination and potentially, the complete displacement of human judgement and decision-making in the kill chair.

Fully Autonomous Air: 'Inevitable'

Air Commodore Clarke asserted that while many found such a prospect immoral and abhorrent, yet all indications were that countries were moving towards this end, well-funded and largely unconstrained. He highlighted that the future of fully autonomous air was inevitable. The evolution was well underway and there was little confidence that it would be banned before its maturity. In his view, it was inevitable because many previous revolutionary technologies reached full maturity before their effect was moderated in any way.

Providing a brief background, he informed that emerging military technologies had followed a general pattern in history, evolving relatively unimpeded until they filled it, providing a temporary advantage to the first mover in a conflict and then evoking a necessary response from the defender which was normally either acquisition of the same or similar capability, development of countermeasures and/or aftereffect regulations of the capability through an international court or other. Air Commodore Clarke insisted that this pattern had applied to everything from the longbow to chemical weapons to cyber warfare. He argued that the advent of autonomous air was, therefore, no more paradigm shifting in warfare than the arrival of air power itself and that had not been banned.



Regulating or Banning Autonomous Air

The Keynote Speaker argued that he had low confidence in a ban because of several reasons. One, autonomous air had been around for a very long time, and he gave specific examples of that. Second, higher order development by China, Israel, Russia, South Korea, Australia, UK, and the US, among others, was already ongoing and these were just a few states that were significantly invested in related technologies. He shared that even in 2018, there were 90 countries experimenting militarily with autonomous air at some level. Apart from these, Air Commodore Clarke shared the following reasons:

- i. Political consensus necessary for a meaningful ban would be challenging.
- ii. Many applications of autonomous air were non-controversial, such as reconnaissance and tankers.
- iii. Some argued that autonomous weapons could ultimately be more reliable than humans, because they could bring new levels of precision and actually be more humane in war with less casualties and less collateral damage.
- iv. Autonomous air was actually quite dissimilar to the sorts of weapons that had been banned over time like cluster munitions or chemical weapons and blinding lasers as it was not simply a device or a tool or a substance rather Artificial Intelligence and autonomy and in multitudes of human domains. In fact, it was a paradigm and attempting to ban a technology in war that had such high utility outside of war, would be novel.

Hence, in his view, achieving the consensus necessary to ban the ongoing development of autonomous air, was extremely improbable. On how to respond to this dilemma ethically and legally, he recommended two options:

- i. Focus on better assuring that it was subject to and conformed with International Humanitarian Law.
- ii. Take the midway between banning and making it comply with the law, which was to demand extra regulation.

Character and Nature of War

Air Commodore Clarke further asserted that it was important to review whether fully autonomous air represented a change in the character of war or in the very nature of war. He stressed that the character of war was definitely changing given the number of aircraft and constraints on pilot numbers. He predicted that the frequency of conflict events was likely to increase, especially through Gray Zone Warfare and Hybrid Warfare. Isolated combat events that may be coercive and aggressive in nature, but which were deliberately designed to remain below the threshold of conventional military conflict, would grow and continue. There would be an increase in the number of asymmetric warfare events, terrorists and non-state actors would acquire inevitable proliferation of technologies. The mode and tempo of air power employment would continue to transform because there would be ongoing improvements in the four 'Ss' of unmanned air power: Size, Speed, Swarms, and Stealth. He further foresaw an end of human air-to-air combat.



Future Prospects

The Air Commodore asserted that humanity was at the threshold of a new technology that could fundamentally change its relationship with war when earlier the only changing element had been the 'human' and now, the world was contemplating 'human-out-of-the-loop.' In this regard, he argued that in the most general terms, low-order autonomy was about the removal of the human from the cockpit. High-order autonomy was the removal of humans from decision-making. The first was real now. The second situation was in prospect. The immediate future of removing the human from the cockpit, man in the loop and man on the loop, was evolving with at least some clarity and certain uncertainty and with enough of its own issues, but the highest end of the continuum without humans in the loop, could lead to what he called 'dragons' that would threaten to re-define the very nature of war. He predicted that this was where the power of existing International

Humanitarian Law, to restrict activity, would be tested. Extra regulation might be necessary and there may be a need to join the extensive global and multidisciplinary collective of people with shared concerns about not just autonomous air, but more fundamentally Artificial Intelligence at the foundations of all things autonomous. He concluded that AI was pervading and could pervade every corner of human life and the issues around it, would involve every professional community. In all matters of AI and its apparent applications, there was a need to make informed, moral judgements about what strategies, permissions and constraints should apply in AI ethics. He lamented that while there was now a solid body of theory and philosophy on such debates, what was not so apparent was the corresponding body of law.



Role of Middle Countries

On the role of countries like Pakistan, New Zealand and for the majority of states that were technology takers (especially in the realm of air power), Air Commodore Clarke stressed that there was an obligation to be intelligent participants in the space and ask concrete and penetrating questions and to insist at international forums on the development of both law and institutional enforcement just as nuclear capability had its laws and institutions such as non-proliferation treaties and international agencies like IAEA.

Collaborative Combat Air (CCA)

Sharing details about what was the current state of transition to inevitable autonomy, the speaker discussed the US Air Space and Cyber Conference where the dominant theme was 'Teaming' through Collaborative Combat Air (CCA). The concept includes formations or networks of platforms working together and comprising a manned lead aircraft supported by autonomous aircraft in the package. It included a pilot of a single combat platform in a contested environment, who thereby, gains multiple unmanned teammates to variously surveille the battlespace ahead and carry out force protection measures, relay intelligence communications and, if necessary, take programmed action on their own account or in concert with the rest of the force. Air Commodore Clarke further shared that USAF was heavily investing in the 'Teaming' concept, and there were many

other non-US teaming programmes under development globally in Europe with Future Combat Air System (FCAS) and further abroad.

Conclusion

In Air Commodore Clarke's analysis, given the problems of immature AI, challenged ethics and absent law around autonomy, focus on 'Teaming' and on keeping a human in or on the loop, was not surprising since the concept also recognised that human-machine combinations were superior or proving superior to either humans or machines or so-called Centaur AI - instead of focusing on replacing humans, focusing on augmenting humans. He argued that the replacement of the fighter pilot in the next generation of combat aircraft was, hence, firmly off the radar. Fighter pilots augmented by flying robots rather than replaced, and keeping the human at the centre of difficult combat decisions in real-time, offset critical pilot shortages, achieves mass and balances the high cost of aircraft through treatable platforms. He predicted that due to this, 'Teaming' might most characterise the next generation of combat air power.

Weaponisation/Militarisation of Space: Strategic Choices of Global Players

Weaponisation of Space

According to **Professor James J. Wirtz**, the race for mastery in space by the technologically advanced nations was leading to a new type of arms race but they did not seem to be objecting to each other's innovations. However, positioning weapons in space would aggravate the situation and lead to catastrophic effects. Unfortunately, while the Outer Space Treaty had banned placing nuclear weapons and weapons of mass destruction in Outer Space, and prohibited military activities on celestial bodies, it offered little on militarisation of space. Professor Wirtz remarked that the limitations created by the Outer Space Treaty were relatively insignificant especially in terms of future activities.

Anti-Satellite Weapons (ASAT) in Space

Professor Wirtz informed that many options were being fully exploited in Outer Space such as ISR, communications and navigation for both civilian and military applications. In contrast to such options, Anti-Satellite Weapons (ASAT) were relatively slow in terms of their progress. While they were available to many states, there was no real rush to exploit this kind of technology in space. On the other hand, hypersonic weapons were getting more attention and there appeared to be a greater rush to exploit this technology.

The speaker shared that militarisation of space was about projecting power in, from, or to space, and highlighted its different kinds of applications and weapons, such as:

- i. Earth-to-space kinetic applications.
- ii. Earth-to-space non-kinetic activities.
- iii. Space-to-space kinetic operations.
- iv. Space-to-space non-kinetic operations.
- v. Space-to-earth kinetic engagement.
- vi. Space-to-earth non-kinetic activities.



Impact on Mankind

Prof. Wirtz asserted that as space was becoming an important resource, hence, increasing the resilience of space systems had become an urgent issue. Furthermore, in addition to kinetic threats like ASAT/hypersonics and physical deterioration, non-kinetic threats like cyberattacks and laser obstruction were also likely to have lasting impact on space activity for an indefinite period. The vulnerability of space systems and policies, was consequently, increasing.

Myths and Reality about ‘Weaponisation’ of Space

When military planners or policymakers thought about space, there was a tendency to see it as a ‘silver bullet’ drawn from the American Old West where there was a special round in the weapon that had an enormous, extraordinary impact, like a war-winning weapon. However, whether space was going to be a war-winning, completely game-changing silver bullet was debatable. Prof. Wirtz shared that Colin Grant, the British strategist, had a lot of doubts about such a constant quest for silver bullets in war as more often than not, these silver bullets were a chimera. They only really existed in the minds of the proponents and had less effect than their advocates led people to believe.

The speaker further added that ‘technological surprise’ was another fallacy like the silver bullet – that with enough time and surprise on one’s side, a game-changing, war-winning weapon could be developed. However, progress in warfare, weapons, strategy, technology, and tactics was constantly evolving. The industry was constantly moving forward and for every weapon, there was very soon, a counter weapon. Hence, the idea that space-based weapons would be game-changing and have a permanent and lasting impact on warfare was probably exaggerated, according to Dr Wirtz, given the history of warfare.



The professor also pointed to the issue of compatibility and integration. He argued that when it came to weaponisation of space, one had to move beyond merely technology experiments and work towards a weapon that was fully integrated with delivery systems, doctrines, and military infrastructure. This was easier said than done.

Arms Race in Space

On the issue of whether there was an active arms race, Dr Wirtz acknowledged that there was a very slow-moving arms race in space where all the key players were watching what the other key players were doing and trying to replicate or counteract the advances made by the other. He further added that the issue must also be seriously considered from a cost-benefit perspective to see whether countries really wanted to introduce a weapon or a type of warfare that rendered their entire military obsolete, especially if one was a leading military. All developed militaries would consider this point. Hence, weaponisation of space was far from being *fait accompli*.

Conclusion

In his concluding remarks, Prof. Wirtz stressed that the infrastructure of modern society was now heavily reliant on space technologies. As a result, Outer Space had become an important enabler (especially for global communications capability), essential for military, economic, and environmental security of leading states and international organisations.

Hybrid Character of Aerospace Power: Disruption & Destruction

In their joint presentation, **Dr Damon Coletta** discussed the nature of aerospace power and **Dr Sannia Abdullah Close** dilated on the implications of this theoretical evolution for Pakistan and its strategy in particular.

Developments in Air Power and Space Power

Outlining the first part of their presentation, Dr Damon Coletta shared that the thesis that 'Aerospace Power' could be seen as 'hybrid power' was true in the beginning, but had become less true after the Gulf War, which the US considered as the first 'Space War.' He argued that while aerospace power was considered 'hybrid power' by many leading

AEROSPACE POWER OF 1990s GULF WAR RESOLVES INTO...

Air Power	Space Power
Douhet – Interwar Arnold & Eaker – Strategic Bombing	Eisenhower/Dulles – ISR Sanctuary
Warden & Project Checkmate – Precision Bombing	Dolman – Ultimate High Ground
Atlantic Council 2022 – Air Attrition on Strategic Defensive	Bowen – Cosmic Coastline

PAKISTAN'S WEAPONS PROCUREMENT

- China – Premier Partnership
 - J-10C Fighter Aircrafts 4.5 Gen
 - Chengdu Wing Loong II (Medium-Altitude Long-Endurance Unmanned Aerial Vehicle)
 - Chinese WZ-10s – Attack Helicopters
 - HQ-9B Long Range Surface-to-Air missiles
- Turkey – Second Key Partner
 - Bayraktar Akinci (Long-Altitude Long-Endurance Unmanned Aerial Vehicle)
 - Bayraktar TB2 (Medium-Altitude Long-Endurance Unmanned Aerial Vehicle)
 - Turkish (T-129 ATAK) – Attack Helicopters
 - YLC-8E Radars

Bayraktar Akinci

strategic thinkers, in the future ‘Air Power’ would be seen as distinct from ‘Space Power.’ In his view, for various countries, especially like Pakistan, this implied that instead of ‘Aerospace Power’, there would be a combined arms philosophy where ‘Air Power Theory’ would proceed on one path, and ‘Space Power Theory’ on another path. In fact, he anticipated that there would be a combatant commanders’ perspective where there was a mission or an operation with both trying to combine assets and instruments to meet the mission.

Lessons from the Russia-Ukraine War

Continuing with his thesis that ‘Air Power Theory’ was travelling a path distinct from ‘Space Power Theory’, Dr Coletta highlighted how the recent Russia-Ukraine War had shown that air superiority may not be the only concept in air power as one may use what was called ‘Air Denial’. He posed an important question as to how one could deny air superiority or access to the air from the other side without being able to establish air superiority oneself. He reiterated that air power and its theories were evolving, and those evolutions were on a distinct path from space power. For example, he shared that recent literature was seeing ‘space’ as a ‘cosmic coastline’ distinct from air power, drawing on metaphors and analogies of continental sea power, not air power, and exploring how space could be utilised for strategic objectives.

Implications for Pakistan

Dr Sannia Abdullah Close, in her part of the presentation, discussed the implications of theoretical evolutions in Space and Air Power for Pakistan. She recommended that

it was important for the country to learn lessons from great powers, like the US, rather than reinventing the wheel. She highlighted that Pakistan's Air Force strategy or Air Force mission was 'to provide in synergy with other services, the most efficient, assured and cost-effective aerial defence of Pakistan.' In her view, the keyword here was 'cost-effective'.

Project Azm

Given Pakistan's economic challenges and the nascent space programme the country was gearing towards, Dr Close briefly discussed Project Azm launched in 2017 with the vision to establish state-of-the-art aviation industrial base in the country with the goal to induct Fifth Generation fighter planes, medium-altitude, long endurance (MALE) unmanned aerial vehicles, and new munitions among other platforms; and latest weapons/aircraft procurements from China and Turkey.

Vulnerabilities of UAVs

Dr Close acknowledged that the role of UAVs in modern warfare had become very critical as seen in the Russia-Ukraine War. While such weapon systems were very important because they were also PGMs, cost-effective, easy to acquire, had high-value targeting capability, and were good for surveillance and reconnaissance, she pointed out that the most important issue not touched upon yet at the conference was the most critical problem with UAVs, that is, they could be hacked. Enemy forces or adversary could get rid of digital signatures and steal data which could be surveillance or reconnaissance information, e.g., forces' ground positions. Another issue raised by Dr Close was how to protect against 'Man in the Middle' (MITM) attacks for which not only good cyber security architecture was needed but also infrastructure with experts in that domain without which it would not be possible to execute UAVs in modern warfare. Hence, she emphasised the need to upgrade cyber security and develop a strong anti-UAV defence system.

Pakistan's Air Space Strategy

Discussing Pakistan's Air Space Strategy, the speaker asserted that it was still following the action-reaction syndrome given the country's history, geographical location, and



long border with India. In this regard, the state was trying to seek technological edge vis-à-vis India. In her perspective, the challenge for Pakistan's air strategy was that if the country kept thinking about its air space strategy from the perspective of ground forces or concentrated more on the air-land battle concept, it would be hard for Pakistan to keep moving with the latest trends because air had to have some kind of dominance.



Missing Links in Pakistan's Aerospace Strategy

According to Dr Close, Pakistan was largely dependent on China for the space domain since her capabilities (unlike India's) were not very advanced. She argued that one of Pakistan's challenges was that it was looking at its adversary through China's lens. Second, while Pakistan and China had useful cooperation in the space domain, this could change if, e.g., international sanctions or obligations were imposed on the latter to limit or restrain cooperation with its international partners. Third, space was an expensive domain, and a cost-effective symmetric strategy would not work. She advised that Pakistan, in its current state, should focus on non-kinetic aspects of warfare (e.g., targeting space satellites from the grounds), instead of upping the ante because every time Pakistan had tried to do that, even when it exercised restraint (as in the recent crisis with India), it did not echo well in the international community. The message, according to Dr Abdullah Close was not conveyed, and the positive effect that Pakistan wanted to generate out of its gesture was not received.

Way Forward for Pakistan

For space exploration, macroeconomic stability was very important for any country and Pakistan had a critical infrastructure problem that it needed to overcome from its space education to training and technology. Second, Pakistan needed to shift from its

air-land battle concept to air-space battle concept and not aerospace (i.e., from hybrid to combined arms philosophy). Third, she recommended that the country needed to foster a strategic relationship with the US and multilateral partnerships with European nations to reduce its dependence on China for its nascent space programme. This, she foresaw as a major challenge since policymakers needed to see what the country could offer to the world. While all major powers were moving towards space exploration, tackling climate change, and Web 3.0, Pakistan was far behind. In fact, in climate change, the country was on the receiving end of the crisis. She was of the view that it would be helpful for Pakistan and the US to have joint workshops or joint war games focusing on non-kinetic warfare. Both countries' air forces could work together to tease out the limitations of technology and analyse its subsequent effects on traditional security in hypothetical scenarios.

Conclusion

Dr Abdullah Close concluded that the broader consensus was that air-space, as a hybrid, was not as significant as one could move towards a combined arms approach and find synergy between different levels and capabilities of the forces.

Role of Aerospace Power in South Asia's Security Environment

Geopolitics and South Asia

According to **Air Commodore Khalid Banuri (Retd)**, the world was in a flux politically – no more unipolar, not yet multipolar, with major powers still in conflict as well as cooperation – some rising, some declining but still with very strong capabilities. With the emergence of new alliances, the centre of gravity was in a flux too – no more classic application of whether whoever ruled the heartland, or the rimland, ruled the world.

In his view, major power rivalries and preferences tended to raise a security dilemma for South Asia, and he gave the example that what the US or Russia considered needed or essential, was to work closely with India for their respective national interest, without necessarily taking into account the adverse impact that this generated due to the legacy of mistrust and suspicion between Pakistan and India. According to him, the recently released National Security Strategy (NSS) of the US formalised the notion of integrated deterrence, suggesting cross and multidomain response options. India, he remarked, would be quick to nationalise this US approach too.

On the subject of a certain 'cohesion' in the South Asian context, the speaker said that





what was really of consequence was the issue of ‘temperance’, denoting balance or the lack of it by some major powers regarding South Asia. It was this lack of ‘balance’ in the approach of global major powers, in particular the US, which tended to augment Indian arrogance and hostility. This also led to another recent and repeat phenomenon, in his analysis, of the rise of ultra-nationalist leaders that had been called ‘Trumpism’ in the past. The obvious manifestation of it in South Asia was the Indian political party BJP, currently led by PM Narendra Modi.

Aerospace Power Evolution

Discussing aerospace power, Air Commodore Banuri, informed that it classically implied anything that moved through the medium of air and space. In today’s parlance, it would not only include air power exercised by modern air forces, including missiles and UAVs, but also use of space for military functions, including but not limited to, communication satellites etc. Aerospace power, which was not kinetic alone, had all the buzz words in its remit – no contact was beyond the classic BVR missiles, multi domain included air, space, unmanned vehicles, AI, and more; NCW could now involve cyber, drones and even media. With sustained effort, Air Commodore Banuri remarked, one could make several assumptions regarding an integrated use for aerial command and control, secure communications and data links, jamming, precision in navigation and possibly targeting, battle damage assessments, support to BMD systems etc, during conflicts.

On Indo-US cooperation in space, he said that this had raised the potential of this domain, in contrast, while Pakistan had embarked on a clear ‘Space Vision 2047’ path, there were many significantly large milestones to be traversed due to issues like lack of sustained funding, applicability of space law, also arguably the involvement of the private sector in the use of space where commercial potential existed, e.g., satellite launch capability.



Indo-US Strategic Partnership

Certain agreements between the US and India in recent years, like LSA (Logistics Support Agreement), opening the horizon for IAF to use US Air Bases and associated facilities and vice versa were significant. Likewise, BECA related to mutual sharing of remote sensing data, meaning Indian satellites were also at US disposal and vice versa. According to Air Commodore Banuri, BECA facilitated the US a great deal to monitor part of Asia through Indian-based downlink facilities. COMCASA related to secure communication and associated equipment gave the IAF access to secure means of communications used by the US.

India's Doctrinal Stance and Posture

Providing some historical context, Air Commodore Banuri highlighted that peace had remained fragile in South Asia until Pakistan restored the strategic balance in response to the second series of Indian nuclear tests in May 1998. This, however, was not necessarily sustainable as the recipe for disaster loomed large given the Indian tendency to escalate at every level possible. The Indian misadventure during Balakot-Pulwama was a manifestation of that. Militaristic designs and weapons' readiness added to that fragility, in his analysis. While India often viewed China as its prime adversary, it was quite obvious that the bulk of its military was laid out against Pakistan. He stressed that the world should recognise and support Pakistan's peace efforts and see them in good faith.

Technology and Media: Impacts on Warfare

On the use of technology and media, Air Commodore Banuri opined that some of the emerging or new technologies did not require a heavy industrial base, e.g., Artificial Intelligence or disruptive technologies like 3D printing. Moreover, research into new technologies was continuously expanding. However, he lamented that the interest of the international community in formalising regulatory frameworks was almost negligible. Here, he also mentioned the impact of media and reminded the audience that the way



the Gulf War was projected by CNN could be remembered to this day and for any war/ conflict, narrative-building or synergy with the media had become an essential need now. In fact, he argued that the use of media reporting had become so vivid that it had led to the belief that every man was his own channel.

Conclusion

Air Commodore Banuri urged that Pakistan needed to ensure effective capability to defend against any aggressive designs in the region which was where effective use of aerospace power had become imperative. He shared that air forces around the world worked around speed, agility, synergy, integration and simultaneity, as a part of their system thinking. Hence, it was necessary for Pakistan to invest in emerging technologies, with positive outcomes. While involving the private sector would be imperative, the military-industrial complex had to lead the way. Moreover, the speed with which decision-making was being done, was increasing consistently which suggested a human-machine interface. The speaker concluded that a whole-of-nation approach was required in addition to the military element, including media specialists, diplomats, IT experts, lawfare experts, and other scholars.

NASTP: An Engine of Aviation Growth in Pakistan

Linkage between National Security and Technological Development

Air Commodore Dr Liaquat Ullah Iqbal began his presentation by discussing that national security and sovereignty were dependent on the well-being of a nation, whereas well-being of a nation was in turn related to the national economy and technological supremacy which ultimately pave a way for national economies, especially, in the era of Information Age, Robotics and Automation. In his view, the COVID-19 pandemic and climate change had not only further validated the importance of technological edge in national well-being, but they actually proved that the very survival of nations was now dependent on investment in technologies that nations decide to make. Therefore, technological advantage and advancements would lead to economies' social well-being and ultimately to national security, as well as sovereignty. He appreciated that the Government of Pakistan had launched its first-ever 'National Security Policy', which makes the well-being of citizens the heart of national security.



Aerospace Industry in Pakistan

Air Commodore Dr Iqbal then discussed the importance of the Aerospace Industry as a strategic industry. He shared that there were very well-founded reasons for the latter and one of the most key was because the industry had proven to be very resilient based on data from the last 75 years. Even if events like 9/11 or the Pandemic caused a little dip, the industry picked up immediately after to newer levels.

Introduction to NASTP

Providing an overview of the 'National Aerospace Science and Technology Park' inaugurated a day earlier at GSTAR by the Chief of the Air Staff, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Air Commodore Dr Iqbal shared that it had been approved by the Government of Pakistan as a project of strategic national importance to be spearheaded by the Pakistan Air Force due to its competence and availability of human resource. The vision behind NASTP was driven by Chief of the Air Staff, to become one of the best aerospace clusters, airspace, cyber and IT clusters in the world with design, R&D, and innovation centres for emerging and disruptive technologies.



Dr Iqbal presented NASTP's rollout plan by showing a video clip, which started with Quaid's vision. He reiterated that the Pakistan Air Force had embarked upon various nation-building efforts predominantly in the aerospace domain. Pakistan Air Force's vision of self-reliance was derived from the strategic direction given by the Father of the Nation Muhammad Ali Jinnah. He pointed out that successive generations of PAF leadership had focused on modernisation campaign through centralised parameters to strengthen and enhance PAF's operational capabilities. In this regard, PAF had established NASTP to target the entire value chain of aerospace systems, certified products such as aircraft, UAVs, robotic, algorithms, simulators, cyber etc. and many more, to bring in the best professionals from the aviation, IT, cyber, academic, urban planning, corporate law, finance, and private sector under one umbrella.

NASTP Future Plans

According to Air Commodore Dr Iqbal, NASTP was planned at four levels. It was being established at Kamra, whereas the smaller supporting units would be established in Rawalpindi, Karachi, and Lahore. These would be techno-parks acting as nurseries for Human Resource Development feeding back into the main centre. Then, the third level was university techno-parks. He shared that seven universities had already been identified, including four campuses of Air University, which was another signature project of the PAF. However, some other lead universities of the country would also establish techno-parks on priority basis. Small software technology parks, which was the initiative of the Pakistan Software Export Board, infrastructure would also be converted into a software technology park. All four levels would be placed under the umbrella of NASTP.

Human Resource

Dr Iqbal further stressed that as a young country with at least 140 million people under the age of 29, Pakistan could use this potential to boost such projects that were being built on the legacy of 50 years of the country's predecessors who had transferred their experience, expertise and confidence to undertake such ventures. Moreover, he added that the removal of bureaucratic problems had been possible by declaring this a project of strategic national importance. This paved the way for all government-to-government relationships with the other countries. However, he clarified that the initiative also had a corporate face that enabled interactions with both the local private sector and international companies.

Success Story

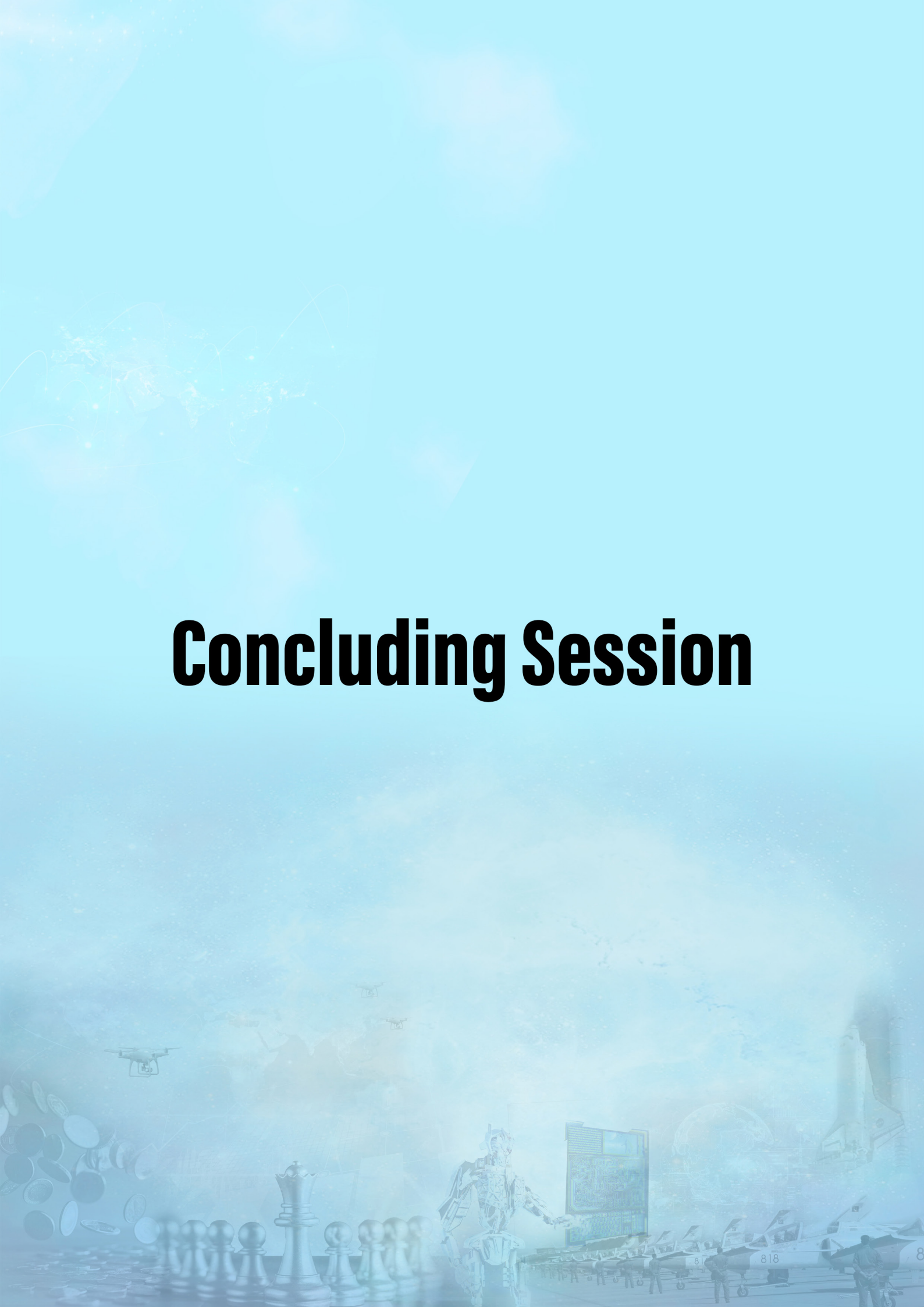
Sharing some of NASTP's achievements to date, the speaker said that a major landmark achieved was the project's successful international collaborations. The project was predominantly part of many strategic economic frameworks that existed between major countries and NASTP personnel were looking forward to working with their international partners.

Conclusion

In the end, Air Commodore Dr Iqbal reiterated that NASTP would work hard to create maximum value for the country's industry, national populace, and institutions. An R&D ecosystem would be built with collaborative linkages, joint ventures, and partnerships. He said that the project would manifest the triple helix model of innovation in the true essence and promote start-ups and SMEs through techno-parks and private sector partnerships. With the motto of 'public sector-led private sector growth', he was hopeful that NASTP would become an engine of growth for the aerospace, cyber and IT industry in Pakistan.



Concluding Session



Concluding Session

Concluding Address³

Air Marshal Muhammad Zahid Mahmood, HI(M)

Vice Chief of the Air Staff, Pakistan Air Force



Colleagues, Veterans, Distinguished Guests from Pakistan and abroad, President CASS, Ladies and Gentlemen, Good Afternoon.

It is indeed a pleasure to be here at the conference's concluding session on Global Strategic Threat and Response 2022.

At the onset, I must felicitate CASS and its team for organising this event that too at an extremely crucial time. The international political and strategic scenario has never been so complex and uncertain as a war rages on in Europe. This war must not be seen in the European context only. It has demonstrated impact over extended geographical boundaries as far as various shades of human security are concerned. This includes food security in many South Asian countries, the Middle East, and African countries. Energy and food prices remain high as Russia's war in Ukraine drags towards the end of eight months with increased pressure from supply chain disruptions and much-reduced production due to climate change and energy security.

Within our region, the situation in Afghanistan remains uncertain and warrants immediate world attention to avert an even worse humanitarian disaster.

While global players do have concerns about the Taliban's government's treatment of women and education, it is incumbent upon us to ensure that basic humanitarian needs are met in a timely manner.

Following our great Quaid's vision of 'Peace within and Peace without', [in] Pakistan, we intend to resolve all disputes including that of Jammu and Kashmir on the basis of long

³ Provisional transcript as delivered.

outstanding UN Resolutions. The rivalry between India and Pakistan has been the central cause of poverty, hunger, and lack of human security in South Asia. Human security, in its entirety, cannot be ensured without focusing on the well-being of people because an economy which does not care for the majority of its population cannot sustain or grow.

Pakistan's relevance due to its strategic location cannot be overemphasised. Various infrastructure projects under the China-Pakistan Economic Corridor are expected to provide better means of communication between major regional countries throughout the length and breadth of Pakistan into China, Afghanistan, and Central Asia. However, the successful execution of this plan would largely depend on peace and stability in Afghanistan for which Pakistan is working relentlessly with major stakeholders within the region and beyond.

The proceedings of GSTAR 2022 have shown us that geoeconomics occupies a pivotal position in the geostrategic strategic calculus of all major state and even non-state actors. There are nations which are favourably disposed towards the paradigm of development-driven and interconnected geoeconomics, but there are also nations whose national security calculus has overridden mutual economic gains and has instead



reverted to a mercantilist and zero-sum paradigm. The world will benefit from a wider interchange of ideas, people, goods, and services. GSTAR 2022 has helped uncover many of these nuances within the wide scope of geoeconomics.

Ladies and Gentlemen, technological progress is an assured way towards economic growth and development of a country. History has never witnessed the impact of technologies on all aspects of human life as is being witnessed now with emerging technologies such as AI, cyber, robotics, biotechnologies and 3D printing etc. While these technologies are extremely helpful in all fields of modern life, they have also created new vulnerabilities threatening everyday work as well as peaceful co-existence. Being dual-use, emerging technologies also have military applications that [are] re-shaping modern warfighting techniques as well as bringing about strategic and doctrinal shifts. Since these technologies are developing at a much faster pace as compared to the formulation of rules to govern their use, this leaves a huge gap in a state's ability to steer and monitor their applications. Legality and ethical aspects of the utilisation of certain technologies remain unanswered. This is likely to impact the value system and framework on which the existing social system and international order are based. I believe there was a specific question also asked on this aspect.

⌘ Owing to their military applications, the race for technology acquisition and supremacy is changing from competition to rivalries. Selective sharing of these technologies, especially in a conflict-prone region such as South Asia, is leading towards strategic instability. ⌘



With their kinetic and non-kinetic disruptive capabilities, the convergence of these technologies will create serious challenges. My take is that for it all to work, we have to work towards the peaceful use of these technologies for the betterment of humanity and formulate rules under an international framework for their military applications.

Ladies and Gentlemen, common and shared concerns about the militarisation of space are not unfounded. The dual-use of technological evolutions has been extremely worrisome, particularly in the developing world primarily due to a lack of space knowledge and capacity to deal with the catastrophic consequences of its potential weaponisation and subsequent fallout. Unfortunately, international organisations, responsible to ensure peace and stability across the globe, do not have the wherewithal to counter the fast-paced technological developments in space primarily because the present international system does not have the power to block any state from using space for military purposes.

⌘ ‘Space Warfare’ at this time may be a theoretical debate, but it may soon become a reality. The establishment of space commands by major world powers and testing of anti-satellite weapons are indicative of the intent of these developed nations that they will not hesitate in using space in any future conflict no matter how limited it is. ⌘

Ladies and Gentlemen, at the end, I once again commend the efforts of Team CASS for organising GSTAR 2022 with such expanded avenues related to National and International Security. I am confident that this year’s conference will help create awareness amongst all segments of society, particularly practitioners about the seriousness of the security environment both at the global as well as at regional levels. The invaluable contributions of the distinguished speakers on such sensitive and complex subjects would immensely benefit policymakers, military strategists, students, researchers, media, and the corporate sector in Pakistan. With that, I thank you all.

Pakistan Zindabad.

Vote of Thanks⁴

Air Marshal Farhat Hussain Khan, HI(M), SBT (Retd)

President, Centre for Aerospace & Security Studies, Islamabad, Pakistan



A little more than a Vote of Thanks to the honourable Guest of Honour Air Marshal Muhammad Zahid Mahmood, Vice Chief of the Pakistan Air Force, former Air Chiefs, Air Chief Marshal Tahir Rafique Butt, Worthy Speakers, Respected Audience at home and abroad, Diplomats, the New Generation that we try to pull across from the universities, Ladies and Gentlemen, Good Morning, Good Evening and Good Afternoon, wherever you are.

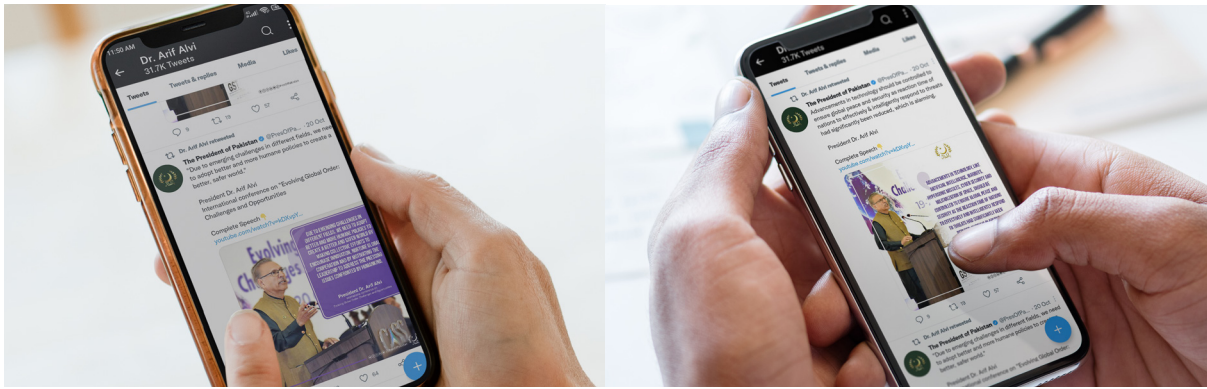
The Centre for Aerospace & Security Studies, commonly referred to as 'CASS', was established in December 2018 just less than four years ago as a think tank to study Aerospace and National Security in all its domains to provide research-based policy guidelines to politico-military leadership, policymakers, informed public, and the intelligentsia, from an independent non-partisan and futuristic approach.

With an aim to grow to be amongst the leading think tanks of the region, CASS has been endeavouring to convey its research-based point of view by constantly extending its outreach through various means like research papers, working papers, books, articles, social and electronic media, by conducting seminars, webinars with its global and domestic partners. GSTAR 2022 is one such effort – an exercise held every two years.

At the culminating stage of the Global Strategic Threat and Response conference and after two days of hectic but intellectually rich discourse, various speakers very ably



4 Provisional transcript as delivered.



highlighted the political, strategic, economic, technological challenges to security, stability across the globe and in Pakistan.

Worthy speakers also recommended various policy options to contribute towards a safe world, stable and peaceful region, and a secure Pakistan. A few salient takeaways from the two-days of proceedings.

First, the two important tweets that the President of Pakistan made this morning after attending GSTAR and I quote, ‘Due to emerging challenges in different fields, we need to adopt better and more humane policies to create a better and safer world by making collective efforts to encourage innovation, nurture global cooperation, and by motivating the leadership to address the pressing issues confronted by mankind.’ The second, ‘Ensuring the provisional provision of health, education facilities and food for all, should be the goal of the New World Order which should be based on morality, compassion, and equality amongst the people and nation-states.’

In the first session the subject discussed mainly and extensively was the shift of balance of power from Atlantic to the Pacific followed by Obama’s ‘Indo-Pacific Strategy.’

From that some conclusions - the alliances like AUKUS, QUAD, Middle East QUAD politics seem to have accelerated the US-China rivalry that may be heading towards a new Cold War.

Political polarisation [is] affecting the independence, integrity, and transparency of International Financial Institutions like FATF and IMF, therefore, strangulating some of the countries.

It is time for major powers to avoid polarisation and adopt a cooperative rather than confrontational approach to resolv[ing] global issues as humanity rightly deserves peace, security, and stability. World powers need to work together in a democratic way to ensure peaceful co-existence, respect for sovereignty of States - shared rather than polarised world.

US-India strategic agreements like LEMOA and COMCASA will result in downloading of critical technologies, including dual-use to India. It would be upsetting the regional balance of power in all three dimensions - political, strategic, and economic - an ideal recipe for destabilising South Asia. Military build-up so achieved would be more for Pakistan-specific rather than aiming for China containment because the tanks don't climb Himalayas.

🌀 Pakistan needs to tread very carefully focusing on its national interests rather than getting sucked into the US-China rivalry and becoming part of it. 🌀



In the geoeconomics session, geostrategies and geoeconomics are two sides of the same coin as narrated by Dr Moeed [Yusuf] yesterday. Therefore, these two are interlinked. You cannot have strong geostrategy without a strong economy and vice versa. Pakistan has very carefully taken the course of proceeding on geoeconomics - a difficult course but needs to be pursued rigorously.

On the trade side, in the presence of so many learned people, I would not go into figures. If you look at our trade, East, West are almost closed for many years, and we all know what happens when it happens. [Of] most of our trade that takes place, only 10-11% is with China, the rest 90% is with the rest of the world. A country that we call a 'strategic partner' is next door. I think for our own benefit, we need to exploit the Chinese market. Just one figure I would like to mention - because of AUKUS and other agreements and

MOUs in this area, the Chinese have started slightly withdrawing from the Australian field. They were importing USD 50 billion meat only from Australia. So just imagine if Pakistan can get only 10% of it, our trade will double with China. So, there is a need to exploit the Chinese corridor and CPEC may provide this opportunity.

In the session on emerging technologies, with developments and induction of new technologies, strategists and practitioners continue to work on strategies to re-establish stability so it's an ongoing game and a continuous process.

Way beyond its defence requirements, the induction of emerging technologies by India sets uncontrollable consequences with strategic stability as its first casualty.

Pakistan, unfortunately, has to accept the challenge to take measures to re-establish stability in the region. Great power rivalry is the major driver of technological development. However, it will take about 15 to 20 years for all these technologies to be operationalised.

In the last session that we had on aerospace - aerospace power, being technology intensive, is becoming or has become an instrument of choice available to the politico-military leadership to achieve their political objective alone or in synergy with other elements of military power. While weaponisation is taking place in space, it definitely needs a framework. Presently, it is not controlled by any international norms. So, therefore, a legal framework is mandatory.



Ladies and Gentlemen, before we disperse, let me once again thank our worthy panellists from across the globe as well as Pakistan for their wholehearted participation in GSTAR. Special thanks to two of our guests who travelled across from the United States and Latvia.

My very special thanks to Dr Arif Alvi, President of the Islamic Republic of Pakistan for sparing his time for this event yesterday morning, and Air Chief Marshal Zaheer Ahmed Baber Sidhu for not only speaking on the forum but also unveiling the NASTP project by using the GSTAR platform. Thanks to Air Marshal Zahid for sparing time for coming this evening for the closing ceremony.

Our thanks to Deputy Chief of the Air Staff Training and all PSOs present or otherwise and their teams for their patronage and support to GSTAR. Our special gratitude to a few important departments of Pakistan Air Force who were here 24/7 with us - Deputy DG Public Relations, Air Commodore Jahanzeb has been there throughout, and Base Commander Islamabad Air Commodore Sohail Akbar for everything, I do not have

words to mention the kind of support that he has provided. And the administrator Air Headquarters Officers' Mess Air Commodore Ayaz Khattak, thank you very much for a job well done and all this support.

Last but not least, my personal appreciation to the entire CASS Team for spending busy weeks and months for reaching this place ahead of the event and burning midnight oil for all the arrangements. I know some of them have not slept for many nights. So, thank you very much for a very splendid effort. Sorry if I missed any name or department that supported us, and we thank you all for being with us for two days. See you next time in the next seminar that we have.

Thank you very much.



Annexures



Annex I:

Speakers' Brief Biographies



Dr Damon Coletta

Director, Eisenhower Center for Space and Defense Studies, USA

Dr Damon Coletta currently serves as Director, Eisenhower Center for Space and Defense Studies and was the inaugural Scowcroft Professor of Political Science, 2020-21 at the United States Air Force Academy (USAFA), USA. Dr Coletta also serves as the Social Sciences liaison to USAFA's nationally recognised 'Nuclear Weapons & Strategy' programme; and is the author of *Courting Science: Securing the Foundation for a Second American Century* (Stanford University Press, 2016). He holds a PhD in Political Science from Duke University; a Master's in Public Policy (S&T) from the Harvard Kennedy School; and a Master's and Bachelor's in Electrical Engineering from Stanford University, USA.



Air Marshal Farhat Hussain Khan, HI(M), SBt (Retd)

*President, Centre for Aerospace & Security Studies (CASS),
Islamabad, Pakistan*

Air Marshal Farhat Hussain Khan has rich experience in aviation and industrial management, diplomacy, and negotiations. During his service, he remained on various important command and staff appointments, including Vice Chief of the Air Staff and Chairman Pakistan Aeronautical Complex Board. He has also served as Pakistan's Air Attaché in New Delhi, India. He is the co-author of 'The Aviation City' and 'Milestones' about the growth of military aviation industry in Pakistan and its way forward.

Dr George Malcom Moore

*Scientist-in-Residence & Adjunct Professor, James Martin Center
for Non-proliferation Studies, Middlebury Institute of
International Studies, USA*



Dr George Malcom Moore is presently working as Scientist in Residence, and Adjunct Professor, James Martin Center for Non-proliferation Studies, Middlebury Institute of International Studies (MIIS), USA since 2012. Earlier, he worked with the United Nations and International Atomic Energy Agency as Senior Analyst. He was also responsible for compiling IAEA's 'Fundamentals of Nuclear Security' document, development of IAEA's 'Nuclear Security Glossary', and coordination of all top-level Nuclear Security Series documents. His expertise includes Nuclear Trafficking, Cyber Security, Nuclear Forensics, Drones and Surveillance, Comprehensive Test Ban Treaty, Nuclear Materials, Diplomacy in the Digital Era, Practicum at Czech Technical University Sparrow Research Reactor, Nuclear Reactors and Non-proliferation, Nuclear and other Radioactive Materials, and Weapons Testing and Effects.

Ambassador Jalil Abbas Jilani

Advisor Foreign Affairs, CASS, Islamabad, Pakistan



In his 38 years of bilateral and multilateral experience as a career diplomat, Ambassador Jilani has served as Pakistan's Ambassador to the United States, Belgium, Luxemburg and the European Union (EU), and Australia. Ambassador Jilani also served as the Foreign Secretary of Pakistan. A specialist in South Asian affairs, Ambassador Jilani has worked as Director General for South Asia and SAARC, Deputy/Acting High Commissioner to India and Director (India) in the Ministry of Foreign Affairs. He is member of the Experts and Eminent Persons Group (EEP) of the ASEAN Regional Forum and member of the Prime Minister's Advisory Council on Foreign Affairs. He has also served as a Senior Fellow at both the International Institute for Strategic Studies (IISS) and the United States Institute of Peace (USIP).

Dr James J. Wirtz

Professor National Security Affairs, Naval Postgraduate School, USA



Dr James J. Wirtz is Professor, National Security Affairs, Naval Postgraduate School in Monterey, California, USA. He is also Editor of the Palgrave MacMillan series, 'Initiatives in Strategic Studies: Issues and Policies'; Section Chair of the 'Intelligence Studies Section'

of the International Studies Association and President of the International Security and Arms Control Section of the American Political Science Association. His areas of expertise include International Relations Theory, Intelligence, Deterrence, Strategy, and Security Studies. Professor Wirtz is the author of 'Understanding Intelligence Failure: Warning Response and Deterrence', apart from dozens of other books and co-edited volumes. His work on intelligence, deterrence, the Vietnam war, and military innovation and strategy has been widely published.



Dr Karl J. Moore

Associate Professor, McGill University, Canada

Dr Karl J. Moore is an Associate Professor at McGill University, Canada; and holds a joint appointment in the Department of Strategy and Organization at the Desautels Faculty of Management. Prior to McGill, he was a full-time faculty member at Oxford University for five years at the Said Business School and Green Templeton College. His newest book, his tenth, will be released in early 2023 is 'Ok Boomers: Working with Millennials and Zs'. Prof. Moore was nominated for the 'Thinkers 50 Distinguished Achievement Award' in the Leadership Category as a top thinker in the area for his work on introverts/extroverts in the C-Suite and Millennials. Prior to academia, he spent 11 years with IBM and Hitachi in marketing and management positions.



Lieutenant General Khalid A. Kidwai, NI, HI(M) (Retd)

*Advisor National Command Authority & Former Director General,
Strategic Plans Division, Government of Pakistan*

Lieutenant General Khalid Ahmed Kidwai has led a meritorious military service spanning over 54 years. He has held a variety of prestigious command, staff and instructional appointments and is a graduate of Pakistan's Command and Staff College, National Defence University, and the US Army Field Artillery School, Fort Sill, Oklahoma. After the May 1998 nuclear tests, Lt. General Kidwai pioneered the establishment of Pakistan's National Command Authority (NCA) and was appointed as the founding Director General of Strategic Plans Division (SPD) in December 1998. He served as DG SPD for over 15 years, and since 2014, is an Advisor to the National Command Authority.

As DG SPD, he conceived, articulated and executed Pakistan's nuclear policy and deterrence doctrines and translated these doctrines into a robust nuclear force structure, oversaw and ensured the establishment of the Army, Navy and Air Force Strategic Force Commands, including the development and operationalisation of a variety of nuclear weapons. He put in place state of the art Command and Control Systems, as well as an effective nuclear security regime for Pakistan's Strategic Assets. He is also the architect of Pakistan's civilian Nuclear Energy Vision-2050. Lt. General Kidwai has

been awarded Pakistan's highest civil award the Nishan-i-Imtiaz, the second highest civil award Hilal-i-Imtiaz, in addition to Hilal-i-Imtiaz (Military).

Air Commodore Khalid Banuri, SI, SI(M) (Retd)

*Former Director General Arms Control & Disarmament Affairs Branch,
Strategic Plans Division, Government of Pakistan*



Air Commodore Khalid Banuri is a practitioner and a scholar with diverse interests and experience spread over 44 years in public service, in four broad realms – aviation, training, education and outreach. He commenced his career as a fighter pilot and flight instructor from the PAF, rising to the rank of Air Commodore. He is a graduate of the F-16 squadron of Combat Commanders' Course, Flying Instructors' School, Air War College and UK's Joint Services Command and Staff College.

He was the first Director General Arms Control & Disarmament Affairs (ACDA) Branch at the Strategic Plans Division (2012-17) and Advisor on Arms Control & Diplomacy (2017-21), wherein he contributed to policymaking in nuclear, missile, space, chemical and biological control, strategic export controls, South Asian security & policy and international law.

Along with partaking in Pakistan's official delegations for bilateral dialogues with countries of Pakistan's interest, he has also represented Pakistan on multilateral forums. With postgraduate qualifications from three Pakistani and two British Universities, in security, strategic, defence, international law and war studies, he has taught at three public sector universities in Pakistan. He is also Member, Expert Oversight Board for Strategic Controls, Ministry of Foreign Affairs, Government of Pakistan; Advisor Training Project Phoenix PAF; Member Administrative Advisory Board, Pakistan Nuclear Society; and Member Board of Advisors Arms Control & Disarmament Centre (ACDC), Institute of Strategic Studies.

Air Commodore Dr Liaquat Ullah Iqbal, SI(M)

CPD & CEO National Aerospace Science and Technology Park, Pakistan



Air Commodore Dr Liaquat Ullah Iqbal is CPD & CEO National Aerospace Science and Technology Park. He hails from GD(P) Branch of Pakistan Air Force and was commissioned on 26 June 1994. Prior to commissioning, he attended the US Air Force Academy (USAFA), Colorado. His research work has been focused on aircraft design including F-22, UAVs and air ships. He academic career includes teaching at the Institute of Avionics and Aeronautics, Air University and as faculty and department head at College of Aeronautical Engineering, National University of Sciences & Technology. As founding CPD and CEO of the Project, he has been leading NASTP over the last five years. He was awarded Sitara-e-Imtiaz

(Military) for meritorious services to the country. Dr Iqbal completed Masters and PhD degrees from School of Aeronautics and Astronautics, Purdue University, USA.



Air Marshal M. Ashfaque Arain, HI(M), SBT (Retd)
*Advisor Chief of the Air Staff on CASS Affairs and Director
Emerging Technologies, CASS, Islamabad, Pakistan*

In his 41-year career, Air Marshal Ashfaque Arain has served as a fighter pilot and in senior command and staff assignments, including command of a fighter squadron, an operational base, Air Advisor Pakistan's High Commission in New Delhi, Chief Project Director Horizon, Assistant Chief of the Air Staff (Operations), Assistant Chief of the Air Staff (Plans), Director General Air Force Strategic Command, Director General Projects, and Deputy Chief of the Air Staff (Administration). His areas of expertise include air power, hybrid warfare, regional security and emerging technologies.



Ms Marina Favaro
*Senior Research Fellow, Institute for Peace Research & Security Policy,
University of Hamburg, Germany*

Ms Marina Favaro is Senior Research Fellow at the Institute for Peace Research & Security Policy, University of Hamburg, where she is responsible for managing the multi-year research programme 'Novel Approaches to Understanding Emerging Technologies'. She is also a Research Consultant at the Centre for Science and Security Studies, King's College London. Earlier, she has also worked as Emerging Technologies Programme Manager & Policy Fellow at BASIC, analyst at RAND Europe, and Fundraising Manager & Project Manager at Global Reporting Centre. She has a large number of publications to her credit. Her expertise includes designing and delivering research focusing on the impact of emerging technologies and safety and security.



Dr Moeed W. Yusuf
Former National Security Advisor, Government of Pakistan

Dr Moeed W. Yusuf is a national security scholar who served as the 9th National Security Advisor to the Prime Minister of Pakistan from 2019 to 2022. Currently, he is appointed as Strategic Advisor to the University of Lahore, and Principal Advisor at Tabadlab. Earlier in 2019, he was appointed as Chairperson of the Strategic Policy Planning Cell (SPPC), which functions under the Pakistani government's National Security Division. He was formerly Associate Vice President of the Asia Centre at the US Institute of Peace in USA. Before joining USIP, he was a fellow at the Frederick S. Pardee Centre at Boston

University, and concurrently a Research Fellow at the Mossavar-Rahmani Centre at Harvard Kennedy School. Dr Yusuf holds Master's in International Relations and PhD in Political Science from Boston University, USA. He is the author of 'Brokering Peace in Nuclear Environments: US Crisis Management in South Asia', and has taught at Boston University, George Washington University in the US and at Quaid-i-Azam University in Pakistan.

Air Commodore R. Shaun Clarke, ONZM (Retd)

*Former Director RNZAF Air Power Development Centre &
Chief of Staff for New Zealand's Joint Forces Command*



Air Commodore R. Shaun Clarke served 36 years in the Royal New Zealand Air Force (RNZAF) as a pilot, operational commander, and strategist. He has variously worked and travelled through 47 countries and has held 26 military roles, including as Director RNZAF Air Power Development Centre, Chief of Staff for New Zealand's Joint Forces Command, and as Defence Attaché posted to Canberra and New Delhi. He has led in numerous conflict areas including Iran, Kosovo, and the Solomon Islands. He is a graduate of the Royal Australian Air Force (RAAF) Staff College, a Fellow of Australia's Centre for Defence and Strategic Studies, and a Graduate of the UK's Royal Air Force Air Battle Staff Course. In 2004, Air Commodore Shaun was appointed an Additional Officer to the New Zealand Order of Merit (ONZM) for leadership in the Solomon Islands intervention. Since leaving the NZDF, he has completed a five-year tour as CEO for Local Government in New Zealand's Far North District; and currently holds numerous private sector directorships and proudly remains on the Standing Reserve for the RNZAF. He is author of 'Strategy, Air Strike and Small Nations' and has ten other published works to his name on Military Air Power, Strategy, International Relations and Culture.

Ambassador Riaz Mohammad Khan

Former Foreign Secretary, Government of Pakistan



Ambassador Riaz Mohammad Khan has served as the Foreign Secretary of Pakistan as the top civil service official in the Ministry of Foreign Affairs. In his 40 years of bilateral and multilateral experience as a career diplomat, he has served as Pakistan's Ambassador to China, Kazakhstan, Kyrgyzstan, Belgium, Luxembourg, and the European Union. He has also been appointed as additional Foreign Secretary, Foreign Office Spokesman, and Director General responsible for Afghanistan and Soviet affairs. As Foreign Secretary, he served as head of the Pakistani delegation to the Pakistan-India Composite Dialogue and the Pakistan-US Strategic Dialogue. After his retirement from the Foreign Service, he spent a year as a scholar at the Woodrow Wilson Center in USA.



Ambassador Robin L. Raphel

Senior Advisor, Centre for Strategic and International Studies, USA

Ambassador Robin L. Raphel is a consultant on political, security and economic development issues in South Asia and the Middle East. As a career foreign service officer, she served nearly 40 years in US foreign affairs agencies, including the Department of State, United States Agency for International Development (USAID), and Department of Defense. She was the first Assistant Secretary of State for South Asia, Ambassador to Tunisia, Vice President of the National Defense University, and Deputy Special Inspector General for Iraq Reconstruction. She managed the sharp increase of development assistance to Pakistan under late Ambassador Holbrooke and deployed to Iraq with the first civilian contingent after the 2003 invasion to help restore the critical food ration system throughout the country. Earlier in her career she served in Pakistan, India, South Africa and the UK, and taught history at Damavand Women's College in Iran. She is a member of the Council on Foreign Relations and a Senior Advisor at the Center for Strategic and International Studies, C&O Resources, and Nichols Liu LLC. Ambassador Raphel holds Master's degrees in Economics from the University of Maryland, USA and Modern European History from Murray Edwards College at Cambridge University in the UK.



Dr Sannia Abdullah Close

Former Visiting Research Scholar, Sandia National Labs, USA

Dr Sannia Abdullah Close is a political scientist working on non-proliferation and regional security issues for over ten years; and hosts a podcast show 'Women with Ambition.' She has been Visiting Research Scholar at Sandia National Labs (2018-19). Since 2010, Dr Close has been part of several Track-II dialogues and Table Top Exercises exploring escalation control and deterrence stability in South Asia. She completed her post-doc as the Stanton Nuclear Security Postdoctoral Fellow at the Center for International Security and Cooperation (CISAC), Stanford University, USA. From 2011 to 2019, she was a faculty member in the Department of Defense and Strategic Studies, Quaid-i-Azam University, Pakistan. She has been published in Space and Defense; International Journal for Nuclear Security; The Washington Quarterly; Asia Europe Journal, among others and is working on her book focusing on the evolution of Pakistan's nuclear behaviour and its deterrence logic. Her primary research interests include Governance, Organisations and Institutions, Military, and Nuclear Policy.

Dr Una Aleksandra Bērziņa-Čerenkova

Head China Studies Centre, Riga Stradins University, Latvia



Dr Una Aleksandra Bērziņa-Čerenkova is a political scientist, China scholar, Head of Riga Stradins University's China Studies Centre, Head of the Asia programme at the Latvian Institute of International Affairs, and a member of the European Think tank Network on China. After having defended her doctoral dissertation on traditional Chinese discourse in Hu Jintao's report to the 17th National Congress of the Communist Party of China, she has held Senior Visiting Research Scholar position at Fudan University School of Philosophy, China and a Fulbright Visiting Scholar position at the Center for East Asia Studies, Stanford University, USA. She publishes on PRC political discourse, contemporary Chinese ideology, EU-China relations, as well as Belt and Road and other transcontinental interconnectivity initiatives.

Dr Usman W. Chohan

Director, Economic Affairs and National Development, CASS, Islamabad, Pakistan



Dr Chohan is among the Top 10 Business Authors on the Social Science Research Network and has published four books in the past four years on 'Public Value & Budgeting: International Perspectives', 'Reimagining Public Managers: Delivering Public Value', 'Public Value and the Digital Economy', and 'Pandemics and Public Value Management'. In the academic realm, his research has been cited widely and his forthcoming book is titled 'Activist Retail Investors and the Future of Financial Markets.'

Dr Wang Wen

Executive Dean, Chongyang Institute for Financial Studies, China



Dr Wang Wen is the Executive Dean, Chongyang Institute for Financial Studies; Deputy Dean and Distinguished Professor of Silk Road School, Renmin University of China; and Executive Director of China-US People-to-People Exchange Research Center. He is also Secretary-General of the Green Finance Committee of China Society for Finance and Banking, a Researcher of the Financial Research Center of the Counsellor Office of the State Council. Earlier, Dr Wen was Chief op-eds Editor and Editorial Writer at Global Times. Many of his research reports have had policy impact and he remains an Advisory Consultant for several Chinese ministries and commissions and has won many honours such as 'Leading Talents in Philosophy and Social Sciences in the "National Ten Thousand People

Plan” (2020); ‘Special Prize for Policy Research in “National High-Level Think Tank” (2019); ‘Reputable Scholars’ (2017); ‘Influential Figures of Chinese Think Tanks’ (2016); ‘China Reform and Development Pioneers’ (2015); and ‘Top Ten Figures of Chinese Think Tank’ (2014). Dr Wen has authored, co-authored, translated and contributed to more than 30 books, including ‘Great Power’s Long March Road: The Views of China’s Rejuvenation and the Future of the World.’



Prof. Dr Yan Xuetong

Dean, Institute of International Relations, Tsinghua University, China

Prof. Dr Yan Xuetong is a Distinguished Professor serving as Dean, Institute of International Relations at the Tsinghua University, China; is Secretary General of the World Peace Forum and is a member of the Russian Academy of Sciences (RAS). He is the founder of the theory of ‘Moral Realism’ and the only Chinese political scientist listed in ‘Most Cited Chinese Researchers’ by Elsevier during 2014-19. He was also named one of the world’s Top 100 public intellectuals by the American journal Foreign Policy in 2008. He obtained his doctorate from the University of California, Berkeley in 1992. Prof. Xuetong has published more than a hundred papers and articles on International Relations. One of his books ‘Analysis of China’s National Interests’ won the 1998 China Book Prize. Several of his books have been translated into English, Japanese, Korean, Hindi, Persian and Albanian.



Senior Colonel Yang Jun (Retd)

Senior Research Fellow, China Institute for International Strategic Studies (CISS), China

Senior Colonel Yang Jun (Retd) is a Senior Research Fellow at the China Institute for International Strategic Studies (CISS). He served in the Chinese People’s Liberation Army (PLA) for over 33 years where he held multiple command and staff appointments. He also served as Defence Attaché of the Chinese Embassy to Lebanon. His areas of expertise include Military Equipment, Technology and the Middle East.



Air Commodore Dr Zia Ul Haque Shamsi, SI(M) (Retd)

Director (Peace & Conflict Studies), CASS, Islamabad, Pakistan

Dr Zia Ul Haque Shamsi has diverse professional, academic and management experience. Retired from Pakistan Air Force (PAF), he has independently conducted research related to contemporary national security, nuclear politics, arms control and disarmament affairs, peace and conflict studies, and strategic management issues. Dr Shamsi is the author of 'Nuclear Deterrence and Conflict Management between India and Pakistan'; and 'South Asia Needs Hybrid Peace.' He regularly writes opinion articles for the Pakistani newspapers, both in English and Urdu, and regularly appears on national TV networks in Current Affairs Programmes.

Annex II:

Conference Programme

Day 1: Wednesday, 19 October 2022

Inaugural Session

1000-1045 hrs	Reception & Registration of Guests
1050 hrs	Arrival of the Chief Guest H.E. President of Pakistan Dr Arif Alvi
1055-1100 hrs	National Anthem of Pakistan & Recitation from Holy Quran
1100-1110 hrs	Welcome Speech by Chief of the Air Staff, Air Chief Marshal Zaheer Ahmed Baber Sidhu, NI(M)
1110-1150	Address by H.E. President of Pakistan, Dr Arif Alvi
1150-1152 hrs	Presentation of Souvenirs
1152-1155 hrs	Group Photograph

International Security Environment: Emerging Challenges & Opportunities

Working Session I

	Moderator	Ambassador Jalil Abbas Jilani , <i>Advisor Foreign Affairs, Centre for Aerospace & Security Studies, Islamabad, Pakistan</i>
	Speakers	
1215-1230 hrs	The US Indo-Pacific Strategy: Implications for International Security	Ambassador Robin L. Raphel , <i>Senior Advisor, Center for Strategic and International Studies, USA</i>
1235-1250 hrs	China's Vision for Regional Peace and Security in the Evolving Geostrategic Environment	Prof. Dr Yan Xuetong , <i>Dean, Institute of International Relations, Tsinghua University, China</i>
1255-1310 hrs	US-China Rivalry: Options for Pakistan	Ambassador Riaz Mohammad Khan , <i>Former Foreign Secretary, Government of Pakistan</i>

1315-1400 hrs	Question & Answer Session
1400-1405 hrs	Presentation of Souvenirs & Group Photograph of Speakers
1405-1435 hrs	Lunch & Prayer Break

Geoeconomics: Driver of the Asian Century

Moderator **Dr Usman W. Chohan**, *Director, Economic Affairs and National Development, Centre for Aerospace & Security Studies, Islamabad, Pakistan*

1440-1455 hrs **Keynote Address & Q/A:**
Pakistan's Transformation from Geopolitics to Geoeconomics
Dr Moeed W. Yusuf, *Former National Security Advisor, Government of Pakistan*

Speakers
1500-1515 hrs **Geoeconomic Impact of Great Power Rivalry in the Asia-Pacific**
Dr Una Aleksandra Bērziņa-Čerenkova, *Head China Studies Centre, Riga Stradins University, Latvia*

1520-1535 hrs **Geoeconomics and the New Asian Hemisphere**
Dr Karl J. Moore, *Associate Professor, McGill University, Canada*

1540-1555 hrs **Peaceful Regional Connectivity and Prosperity**
Dr Wang Wen, *Executive Dean, Chongyang Institute for Financial Studies, China*

1600-1650 hrs Question & Answer Session

1600-1650 hrs Presentation of Souvenirs & Group Photograph of Speakers

1700-1730 hrs Refreshments

Working Session II

Day 2: Thursday, 20 October 2022

Emerging Technologies & Future Warfare

1015-1050 hrs Reception & Registration of Guests

1100-1105 hrs National Anthem of Pakistan & Recitation from Holy Quran

Moderator **Air Marshal M. Ashfaque Arain, HI(M), SBt (Retd)**, *Advisor Chief of the Air Staff on CASS Affairs and Director Emerging Technologies, Centre for Aerospace & Security Studies, Islamabad, Pakistan*

1110-1125 hrs **Keynote Address:**
Militarisation of Emerging Technologies: Implications on Strategic Stability in South Asia
Lieutenant General Khalid A. Kidwai, NI, HI(M) (Retd), *Advisor National Command Authority & Former Director General, Strategic Plans Division, Government of Pakistan*

Speakers

1130-1145 hrs **Technologies and Future Warfare: Impact & Options**
Senior Colonel Yang Jun (Retd), *Senior Research Fellow, China Institute for International Strategic Studies (CISS), China*

1150-1205 hrs **Drones and Proliferation of LAWS: The New Battle Space**
Dr George Malcom Moore, *Scientist-in-Residence & Adjunct Professor, James Martin Center for Non-proliferation Studies, Middlebury Institute of International Studies, USA*

1210-1225 hrs **Military Applications of AI and Cyber Warfare: Implications for Strategic Stability**
Ms Marina Favaro, *Senior Research Fellow, Institute for Peace Research & Security Policy, University of Hamburg, Germany*

1230-1315 hrs Question & Answer Session

1315-1320 hrs Presentation of Souvenirs & Group Photograph of Speakers

1320-1400 hrs Lunch & Prayer Break

Working Session III

Aerospace Security: Determinants and Future Prospect

Moderator **Air Commodore Dr Zia Ul Haque Shamsi, SI(M) (Retd)**, *Director (Peace & Conflict Studies), Centre for Aerospace & Security Studies, Islamabad, Pakistan*

1405-1420 hrs **Keynote Address:**
Future of Manned vs Unmanned Aerospace Operations
Air Commodore R. Shaun Clarke, ONZM (Retd), *Former Director RNZAF Air Power Development Centre & Chief of Staff for New Zealand's Joint Forces Command*

Working Session IV

Speakers

1425-1440 hrs	Weaponisation/Militarisation of Space: Strategic Choices of Global Players Dr James J. Wirtz , <i>Professor National Security Affairs, Naval Postgraduate School, USA</i>
1445-1500 hrs	Hybrid Character of Aerospace Power: Disruption & Destruction Dr Damon Coletta , <i>Director, Eisenhower Center for Space and Defense Studies, USA</i> & Dr Sannia Abdullah Close , <i>Former Visiting Research Scholar, Sandia National Labs, USA</i>
1505- 1520 hrs	Role of Aerospace Power in South Asia's Security Environment Air Commodore Khalid Banuri, SI, SI(M) (Retd) , <i>Former Director General Arms Control & Disarmament Affairs Branch, Strategic Plans Division, Government of Pakistan</i>
1525- 1540 hrs	NASTAP: An Engine of Aviation Growth in Pakistan Air Commodore Dr Liaquat Ullah Iqbal, SI(M) , <i>CPD & CEO National Aerospace Science and Technology Park, Pakistan</i>
1545- 1615 hrs	Question & Answer Session

Concluding Session

1615-1620 hrs	Arrival of Guest of Honour, Air Marshal Muhammad Zahid Mahmood, HI(M) , <i>Vice Chief of the Air Staff, Pakistan Air Force</i>
1625-1635 hrs	Address by Guest of Honour
1640-1655 hrs	Vote of Thanks Air Marshal Farhat Hussain Khan, HI(M), SBt (Retd) , <i>President, Centre for Aerospace & Security Studies, Islamabad, Pakistan</i>
1655-1700 hrs	Presentation of Souvenirs & Group Photograph
1705 hrs	Refreshments

Annex III:

Media Highlights

Electronic Media



Print Media

This block features a collage of newspaper front pages. On the left is 'Today's Muslim' with the headline 'GSTAR conference on "evolving global order challenges and opportunities" held'. In the center is 'Daily National' with the headline 'Efforts stressed for int'l legislation for emerging technologies' peaceful use'. On the right is 'The Nation' with the headline 'GSTAR 2022 Curtain Raiser'. The collage also includes a 'Daily SOON TIMES' logo and a 'DESTINATION' logo.

This block shows the front page of 'Daily News Lark' with the headline 'GSTAR 2022 Curtain Raiser'. The page features a large photograph of the conference attendees and a sub-headline 'KARACHI: The aim of GSTAR is to explore pressing challenges emerging from the global...'. The newspaper's logo and contact information are also visible.

This block displays the front page of 'The Nation' with the headline 'Efforts for emerging technologies' peaceful use necessary: Air Marshal Zahid'. The page includes a sub-headline 'AGENCIES ISLAMABAD' and a photograph of Air Marshal Zahid speaking at a podium. The newspaper's masthead and logo are prominent.

This block shows the front page of 'Patriot Islamabad' with the headline 'GSTAR 2022 Curtain Raiser'. The page features a large photograph of the conference attendees and a sub-headline 'ISLAMABAD: The aim of GSTAR is to explore pressing challenges emerging from the global...'. The newspaper's masthead and logo are prominent.

This block displays the front page of 'Parliament Times' with the headline 'President visits Air Headquarters'. The page includes a sub-headline 'By Daily Parliament Times - October 19, 2022' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block shows the front page of 'Islamabad Post' with the headline 'President Dr. Arif Alvi visits Air Headquarters'. The page includes a sub-headline 'THE GULF OBSERVER' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block displays the front page of 'Pakistan Observer' with the headline 'Complex dynamics of world politics has changed balance of power: Alvi'. The page includes a sub-headline 'Lives and Cars of Pakistan' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block shows the front page of 'VOG Voice of Germany' with the headline 'President visits Air Headquarters'. The page includes a sub-headline 'Spread the love' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block displays the front page of 'The Nation' with the headline 'GSTAR moot urges major powers to avoid polarisation to resolve global issues'. The page includes a sub-headline 'Speakers caution selective sharing of space technologies in South Asia may lead towards strategic instability' and a photograph of the conference attendees. The newspaper's masthead and logo are prominent.

This block shows the front page of 'Digital Press of Pakistan' with the headline 'President of the Islamic Republic of Pakistan visits Air Headquarters'. The page includes a sub-headline 'Evolving Global Order: Challenges and Opportunities' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

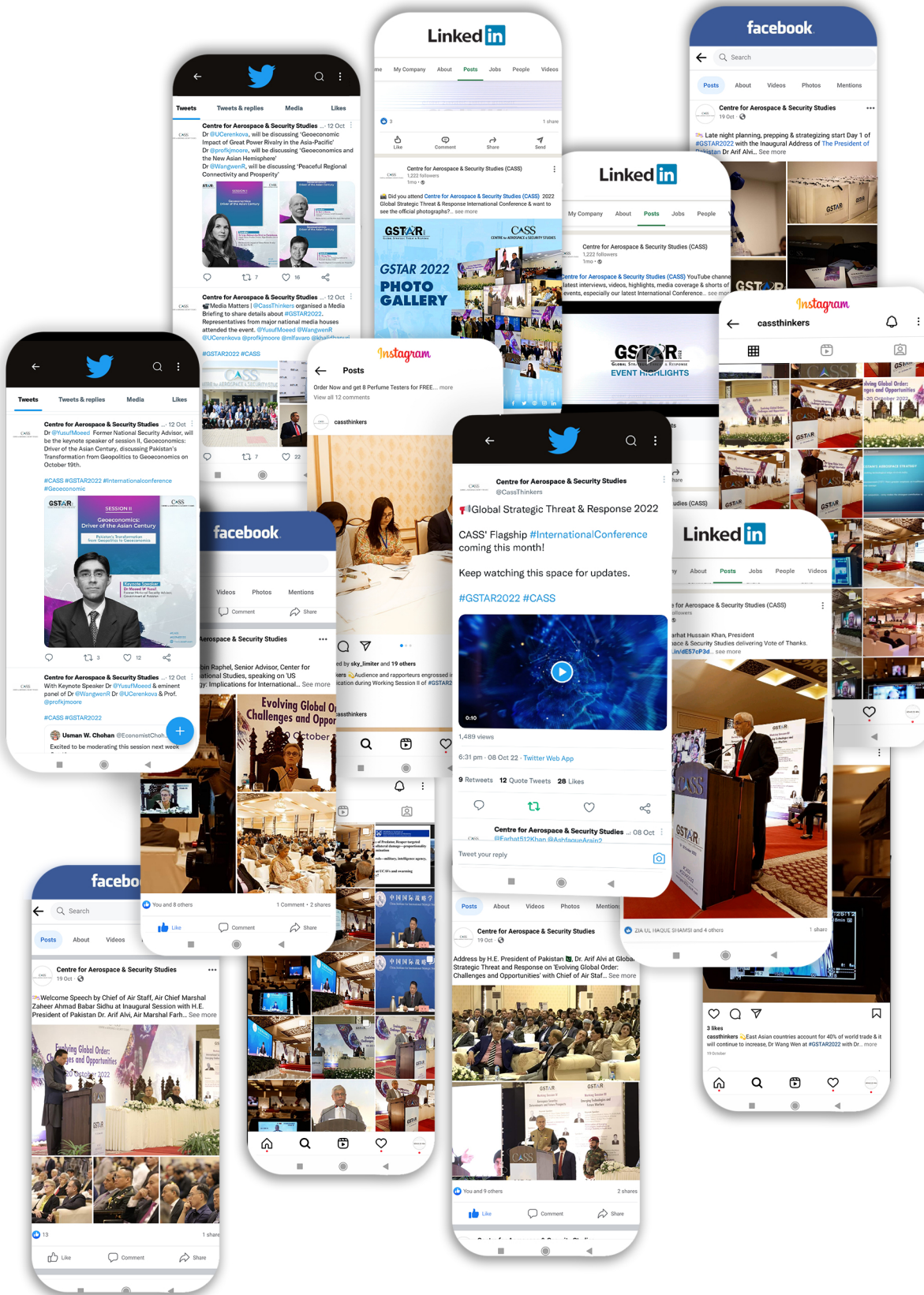
This block displays the front page of 'Pakistan Today' with the headline 'President for national strategy to meet conventional, cyber warfare challenges'. The page includes a sub-headline 'President for national strategy to meet conventional, cyber warfare challenges' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block shows the front page of 'Daily Times' with the headline 'Efforts stressed for int'l legislation for emerging technologies' peaceful use'. The page includes a sub-headline 'Voice of Air Staff: Air Marshal Muhammad Zaid Mahmood on Thursday said it was necessary for the nations to work for peaceful use of emerging technologies and international legislation ensuring betterment of mankind rather than destruction of humanity' and a photograph of Air Marshal Zahid speaking at a podium. The newspaper's masthead and logo are prominent.

This block displays the front page of 'The News' with the headline 'President calls for national strategy to meet challenges'. The page includes a sub-headline 'By Muhammad Anis - October 20, 2022' and a photograph of President Arif Alvi at the Air Headquarters. The newspaper's masthead and logo are prominent.

This block features the logo and contact information for 'DIPLOMATIC NEWS AGENCY'. The logo includes the acronym 'DNA' and the full name 'DIPLOMATIC NEWS AGENCY'. Below the logo, it states 'Pakistan's Premier and Credible Wire Service'. Contact information for various media outlets is provided.

Digital Media



Annex IV:

Conference Figures



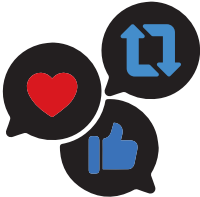
163 Academia



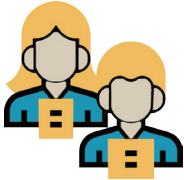
282 Serving & Retired Officers



40 Government Officials



Social Media Engagement
200,000



Participants
1000+



110 Media



40 Think Tanks



63
Diplomats



About CASS

The Centre for Aerospace & Security Studies (CASS), Islamabad, was established in 2018 to engage with policymakers and inform the public on issues related to aerospace and security from an independent, non-partisan and future-centric analytical lens. The Centre produces information through evidence-based research to exert national, regional and global impact on issues of air power, defence and security.

Vision

To serve as a thought leader in the aerospace and security domains globally, providing thinkers and policymakers with independent, comprehensive and multifaceted insight on aerospace and security issues.

Mission

To provide independent insight and analysis on aerospace and international security issues, of both an immediate and long-term concern; and to inform the discourse of policymakers, academics, and practitioners through a diverse range of detailed research outputs disseminated through both direct and indirect engagement on a regular basis.

Programmes

Foreign Policy
National Security
Emerging Technologies
Aviation Industry & Technology Studies
Economic Affairs & National Development
Warfare & Aerospace
Strategic Defence, Security & Policy
Peace & Conflict Studies



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