

THREATS FROM CLIMATE CHANGE TO THE MILITARY SECURITY OF PAKISTAN

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Abstract

The nexus between climate change and military security is essentially non-existent in Pakistan's security discourse. The paper argues for the connection between these two sectors - from the Copenhagen School framework of security - and presents how threats from climate change threaten Pakistan's military security. Most notable threats, in severity and frequency, are sea level rise, cyclone risks, drastic floods, warming patterns, and glacial melting. Sea level rise and cyclone risks impact naval assets and infrastructure while warming patterns and glacial melting affect troop movement, deployments, and logistics. Resultantly, military training, force capacity, and operational readiness is affected. Threats are more potent in strategically significant locations (Siachen, Sindh, and Punjab) which house important forward military bases. The paper provides actionable recommendations that create foundations for future steps as well.

Keywords: *Climate Change, Pakistan's Military Security, Extreme Events, Operational Readiness, Force Capacity*

Introduction

Anything that operates does so in a certain environment and military always has to consider the surroundings in which it functions. This has even been a part of its strategy and the larger discipline of strategic studies. Naturally, changes to the environment will have an impact on anything operating in that area. Climate change constitutes a change in the environment in which a military operates, and reasoning would suggest these shifts necessitate a focus towards those changes. However, that has not been the case in a substantive way on a global level, particularly in Pakistan. The security focus in Pakistan has been traditional and military specific but has failed to incorporate emerging threats that

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hold substantial threat potential. This neglect is dangerous since it refuses to consider climate change reality, that poses threat to Pakistan's military security.

The nexus between climate change and military security is an underexplored area and one that is almost non-existent in the security discourse of Pakistan. Climate change has been acknowledged and termed officially as a national security threat at the Islamabad Security Dialogue (ISD) 2021, a forum for identifying and reaching a consensus on threats to national security.¹ The following ISD 2022 reiterated and linked climate change with national security.² Subsequently, the National Security Policy of Pakistan 2022-2026 released by the government clearly highlighted its impact in areas of development, economic security, food security, and water security.³ However, these national level security documents and forums have yet to identify the link between a non-traditional threat like climate change and traditional security sectors like military. The discourse outside of government documents has also discussed climate change as a threat to national security, creating insecurities in economic, food, energy, water, and other domains.⁴ While these are important contributions to the discourse around how climate change is an existential and multi-sectoral threat, they leave out how it can also threaten the military; an important sector of national security. The literature even highlights how climate change can damage peace and stability, and play its role as a threat multiplier by exacerbating existing tensions and insecurities⁵. Yet, it fails to investigate direct threat linkages or a connection between climate change and military security. As a result, there is a gap that requires exploration to create a body of knowledge for academic research and for

¹ National Security Division, "Islamabad Security Dialogue Event Report," Ministry of Foreign Affairs, May, 2021, <https://mofa.gov.pk/wp-content/uploads/2021/05/Islamabad-Security-Dialogue-Event-Report.pdf>.

² The News International (Islamabad), April 2, 2022, <https://www.thenews.com.pk/latest/946761-coas-gen-bajwa-addresses-islamabad-security-dialogue-2022>.

³ National Security Division, "National Security Policy of Pakistan 2022-2026," Government of Pakistan, January, 2022, <https://static.theprint.in/wp-content/uploads/2022/01/NSP.pdf>.

⁴ Mahnoor Hayat Malik, "The Non-Traditional Security Threat of Climate Change in South Asia," The Roads Initiative, February 27, 2022, <https://theroadsinitiative.org/the-non-traditional-security-threat-of-climate-change-in-south-asia/>; Hamid Mir, "Climate Change is a Bigger Threat to Pakistan than Terrorism," *The Washington Post*, July 4, 2022, <https://www.washingtonpost.com/opinions/2022/07/14/climate-change-pakistan-india-worse-threat-terrorism/>.

⁵ Jumaina Siddiqui, "Pakistan's Climate Change Challenges Pose a National Security Emergency," United States Institute of Peace, July 7, 2022, <https://www.usip.org/publications/2022/07/pakistans-climate-challenges-pose-national-security-emergency>.

policy creation as well as action. Thus, the paper studies this linkage with its primary question that climate change manifestations in Pakistan have the potential to threaten its military security directly and indirectly. It uses qualitative data, both primary (press releases, government policy documents and government reports) and secondary (books, research articles, newspaper articles, reports, and web articles) to study its operating research question. The paper discusses the link between climate change and military security and specific climate change manifestations that may threaten military security of Pakistan. It also explores how those threats will form and what aspect of the military will be impacted.

Copenhagen School Framework and Definitional Understandings

This paper's operating research question prompts a broader understanding of security because of which theoretical frameworks such as realism are insufficient, since it perceives mostly external threats as being threatening to the state⁶. Multitudes of new threats have emerged and been identified as threatening to the state after the cold-war era. These have been adequately categorised in the Copenhagen School's framework of comprehensive security which includes five sectors: political, social, economic, military, and environment.⁷ As the paper studies threats from climate change to the military security of Pakistan, it relies on this framework while using its environment and military sector as focus areas. According to the comprehensive security framework, forces may arise from any of these sectors and be existential enough to be deemed as threats to national security, which then allows them to be made into national security issues so that action can be taken to address them.

The comprehensive security framework points out that the state is not the only referent object for the military and that threats other than external threats may become so existential to the survival of the armed forces that the military sector itself is raised to the referent object status.⁸ In such a case, adequate action is required to address that threat and that requires it to be securitised. Securitising is a speech act that brings a threat to an existential level, which allows for a state of exceptionality that makes any action to deal with it acceptable.⁹ Normally, the securitising agent is the government or a government body. However, the paper explores how

⁶ Emily Tripp, "Realism: The Domination of Security Studies," E-International Relations, June 14, 2013, <https://www.e-ir.info/2013/06/14/realism-the-domination-of-security-studies/>.

⁷ Bary Buzan, Ole Waever, and Jaap Wilde, *Security: A New Framework for Analysis*, (Colorado: Lynne Rienner Publishers, 1998), 21-23.

⁸ Bary Buzan, Ole Waever, and Jaap Wilde, *Security: A New Framework for Analysis*, 22.

⁹ *Ibid.*, 26-27.

the military security could be threatened so the military sector institutions are treated as the securitising agent. Without an emphasis that climate change can threaten military security as well, it may go unaddressed since protection against a threat is only possible once it is identified as such by the organisation or state institution that is being threatened. Therefore, after exploring the linkage, the paper presents suggestions to securitize climate change as a significant threat to the military security for it to be accepted by the military sector itself and to create a space for substantive action in the future.

Climate change and military security have specific meanings and they must be clearly defined. For the purpose of this paper, an understanding of climate change is needed that is both scientific in its formation and shows acceptability within the larger military sector. The Global Military Advisory Council states that climate change is understood as a significant and permanent change in the climate of a given region or area that is observed over extended periods.¹⁰ This change is also anthropogenic, which means that it is caused by human activity and results in intense weather events. There can be variations in what is thought of as military security, especially since what is a security issue depends on theoretical frameworks and also requires a level of general acceptability. The definition presented by the United States (US) Department of Defense's 'DOD Dictionary of Military and Associated Terms' document is useful since it explores climate change threats to military in multiple policy and defence review publications. It states that military security consists of all those threats that can hinder or impair the military's effectiveness.¹¹ Additionally, and as per the comprehensive security framework in the Copenhagen school, military security is tied to the security of the state and its survival from internal and external military threats as well as non-military threats.¹²

Pakistan's Climate Change Risk Profile and Threats to Military Security

Climate change threats have been proven existential and disproportionate for some countries in comparison to others. Pakistan falls in the category of states most at risk from climate change threats as compared to its contributions towards Greenhouse Gas (GHG) emissions

¹⁰ Wendell King, "Climate Change: Implications for Defense," Global Military Advisory Council, June 5, 2014, https://static.s123-cdn-static-d.com/uploads/4109963/normal_5f68bf0d6ca46.pdf.

¹¹ "DOD Dictionary of Military and Associated Terms," Office of the Chairman of the Joint Chiefs of Staff, June, 2018, 206, <https://www.hsdl.org/?view&did=813130>.

¹² Bary Buzan, Ole Waever, and Jaap Wilde, *Security: A New Framework for Analysis*, 50.

and climate change. Global Climate Risk Index ranks Pakistan among the top ten countries at the risk of climate change.¹³ The report also categorises Pakistan as a country that has been and will be prone to extreme events in the future. These risks have risen from climate change globally and in Pakistan potentially threatens military security.

The military sector is often overlooked in discourse surrounding climate change threats at a global level and especially in Pakistan. Some progress has been made in developed countries such as the USA in terms of viewing the military sector as being threatened from climate change, which is highlighted below. However, focus is needed in Pakistan keeping in mind the existential and disproportionate nature of climate change threats. For this purpose, those threats must be highlighted which hold the highest potential of impacting military security and discussing the form and shape of those threats. States that have given credence to the nexus between climate change and military security provide insight through comparative applicability, which means their operational environments and military systems are similar to Pakistan. These states primarily include the US with its military presence at various bases in Pakistan's regional environment and India due to a shared geography.

Threats from climate change to military security or the military sector at large have been documented and reported in the 21st century. This has been led by the US military sector, which has outlined and elaborated on how its security can and has been affected through threats that arise from climate change. This paper focuses on a select few that possess comparative applicability for the military security of Pakistan. Military security can even come into question through a burdened and diluted force capacity due to frequent occurrence of climate induced conflicts and disasters because of which the military is called in for relief efforts, as has been evaluated by *The National Security, Military, and Intelligence Panel on Climate Change* (USA).¹⁴ Such forecasts can be applicable to Pakistan's military security; however, there are more direct links between climate change manifestation and threats. Nevertheless, the link between climate change and military security is evident, both directly and indirectly.

Direct Threats to Military Security from Climate Change

A direct relation between military security and climate change has been established over the last 15 years. The US Department of Defense

¹³ David Eckstein, Vera Künzel, and Laura Schäfer, "Global Climate Risk Index 2021," Germanwatch, January 2021, 13.

¹⁴ National Security, Military, and Intelligence Panel on Climate Change (NSMIP), "A Security Threat Assessment of Global Climate Change," The Centre for Climate and Security, February, 2020, 23.

(DoD), in its 2006 Quadrennial Defence Review, outlined how severe climate change induced events can threaten military infrastructure and assets.¹⁵ Subsequently, the DoD in a congressionally mandated report outlined the directly impactful threats it faces from climate change. The US Air Force Base Tyndall Florida was struck with a devastating Hurricane that affected the base and its 325th Fighter Wing of F22-Raptors became inoperable for a month.¹⁶ This threat was not restricted to a single base but a majority of the US Air Force bases were damaged due to recurrent and severe flooding.

In South Asia specifically, the link between climate change and military security is identified by the Global Military Advisory Council on Climate Change.¹⁷ Direct threats from climate change normally occur as impacts on military infrastructure and assets, mostly naval through sea level rise and oceanic climate change induced events.¹⁸ However, as the paper argues, these direct threats Pakistan may also experience these direct climate change threats in the form of hindrance in the military movement ability in strategic areas (Siachen), training ability, and operational readiness through glacial melting, increase in average warming, rise in maximum average temperatures, and extreme heat. In order to highlight these elements, the paper first discusses climate change manifestations along with their nature and severity in Pakistan.

Precipitation Changes and Severe Flooding Risk

Climate change and its threats in Pakistan have been observed and reported by numerous credible sources of literature, making them an established reality that can significantly damage economic, social, and military sectors. Since 1960, climate change data shows that the arid plains and coastal belt of Pakistan experienced a mean decrease of 10-15 per cent in rainfall.¹⁹ As a country in a temperate zone, decrease in mean

¹⁵ Joshua Busby, "Climate Change and National Security," Council on Foreign Relations, November, 2007, 6.

¹⁶ Benjamin Silliman, "Climate Change Is a Threat to Military Security" Council on Foreign Relations, January 23, 2019, <https://www.cfr.org/blog/climate-change-threat-military-security>.

¹⁷ Tariq Ghazi, A. Muniruzzaman, and A. Singh, "Climate Change & Security in South Asia," Global Military Advisory Council on Climate Change, 2016.

¹⁸ Centre for Climate and Security, "Climate Security 101," Centre for Climate and Security, February, 2015, 2 <https://climateandsecurity.org/>; Shirley Scott and Shahedul Khan, "The Implications of Climate Change for the Military and for Conflict Prevention, Including through Peace Missions," *Air & Space Power Journal - Africa and Francophonie* 7, no. 3 (2016), 83, https://www.airuniversity.af.edu/Portals/10/ASPJ_French/journals_E/Volume-07_Issue-3/scottkhan_e.pdf.

¹⁹ World Bank Group, "Climate Risk and Adaptation Country Profile: Pakistan," World Bank Group, April 2011, 3.

rainfall can be devastating for agricultural yields and have spill-over effects on the economic output. The decrease in mean rainfall in arid plains is coupled with rainfall increase in northern areas, contributing to flood risks.²⁰ Projections from the Intergovernmental Panel on Climate Change (IPCC) clearly indicate a higher likelihood of climate induced disaster events resulting from heavy precipitation within the warming estimates of Pakistan.²¹ A higher occurrence rate of said events would result in the onset of disastrous outcomes.

Extreme floods in the past have shown their capacity to devastate the country. In the 2010 floods, Pakistan experienced the devastation of hectares of land, the uprooting of entire communities, and costs upwards of billions of USD to the economy.²² An increased likelihood by 2.7 times, as projected by IPCC, will mean sheer destruction with the added frequency of such flooding events.²³ Exacerbated risk of severe floods also indicates an increase in disaster relief operations that hold the potential for threatening military security. Along with floods, sea level rise also holds the potential to create damaging impacts.

Sea Level Rise

As a coastal state of the Arabian Sea and the Indian Ocean, Pakistan has not been immune to sea level rise and its related threats. This sea level rise is attributed to both warming of the oceans and glacial melting resulting in its volume loss.²⁴ Karachi, in particular, is more vulnerable to threats from sea level rise because of its tidal flat topography. Relatedly, sea level rise in Pakistan will also cause shrinking of the Indus Delta and is expected to lead to more general coastal belt erosion.²⁵ Pakistan specific and regional forecasts state that sea level rise is projected to increase even further in future due to an intersection of warming of ocean temperatures and glacial melting.²⁶ As a result, threats from sea level rise in Pakistan are

²⁰ Ibid.

²¹ Intergovernmental Panel on Climate Change, "Climate Change 2021: The Physical Science Basis," Intergovernmental Panel on Climate Change, 2021, 18; World Bank Group, "Pakistan," Climate Change Knowledge Portal, 2021, <https://climateknowledgeportal.worldbank.org/country/pakistan/climate-data-projections>.

²² World Bank Group, "Climate Risk and Country Profile: Pakistan," World Bank Group, 2021, 20.

²³ Intergovernmental Panel on Climate Change, "Climate 2021: Physical Science," 18.

²⁴ Asian Development Bank, "Climate Change Profile of Pakistan," Asian Development Bank, 2017, 17.

²⁵ Ibid., 33-34.

²⁶ World Bank Group, "Climate Risk and Adaptation Country Profile: Pakistan," 6; Intergovernmental Panel on Climate Change, "Regional Fact Sheet – Asia," IPCC: Sixth Assessment Report, 2021, <https://www.ipcc.ch/report/ar6/>

significant and potentially devastating for military security as well due to naval installations in the region.

Warming Patterns

Climate change is affecting precipitation patterns. Temperature extremes such as days and nights with maximum and minimum recorded temperatures have shown changes. Cold nights went down by approximately 10 days and hot days increased by 20 days as well as hot nights by 23 days, showing an overall warming trend from 1960 onwards in Pakistan.²⁷ Projections of temperature increase leading to different warming trends, show a gravely dangerous future as well. Increase in the global average temperature is projected at 3.7°C in case of high emissions by the IPCC but Pakistan may experience warming, disproportionate to the global average of 4.9°C by the end of the 21st century.²⁸ Threat scenarios of such warming can have catastrophic and overarching impacts.

Warming patterns and trends in Pakistan are undeniable and severe as a potential threat but are differentiated on a regional basis. While the country exhibits increased warming since 1961, the rate of warming has been higher in Punjab, Sindh and Balochistan along with an increase in the average for the daily maximum temperature.²⁹ Sindh and Balochistan are crucial coastal zones for Pakistan's Navy. Furthermore, Punjab and Sindh also house important Airforce bases and Army Corps deployments in relation to the eastern border with India.³⁰ Temperature trends and warming patterns, which have all been predicted to increase much more over time, provide a wide range of dangers when paired with the increased frequency of heat waves.³¹ Such cases can directly and indirectly threaten military security.

Glacial Melting

Global warming and temperature increase has resulted in significant glacial melting that creates intersecting threats. Similar to other

²⁷ World Bank Group, "Climate Risk and Adaptation Country Profile: Pakistan," 3; Intergovernmental Panel on Climate Change, "Climate Change 2021: The Physical Science Basis," 18.

²⁸ World Bank Group, "Pakistan."

²⁹ World Bank Group, "Climate Risk and Country Profile: Pakistan," 6.

³⁰ Lt. Gen. Prakash Katoch, "Nuclear Pakistan – Incessant Tail Wagging," *Indian Defense Review*, October 23, 2015, <http://www.indiandefencereview.com/news/nuclear-pakistan-incessant-tail-wagging/> (accessed November, 2021); Global Security, "Pakistan Air Force Bases," 2021, <https://www.globalsecurity.org/military/world/pakistan/airbase.htm>. (accessed November, 2021)

³¹ Intergovernmental Panel on Climate Change, "Regional Fact Sheet – Asia.;" World Bank Group, "Pakistan."

areas, glacial melting is taking place at a higher rate in Pakistan than the global average and naturally it adds to sea level rise in the country's coastal zones.³² From 1990 to 2000 alone, three major glaciers of Pakistan experienced significant volume loss, the highest of which was a 11.09 per cent volume loss observed in Siachen.³³ Reports indicate that Himalayan glaciers have been receding ever since with substantial losses to their volume, especially since Pakistan's northern areas have experienced higher warming.³⁴ When combined with increased and intensified precipitation in the north, glacial melting worsens flood risks and threats mentioned earlier. Resultantly, it also creates other threats applicable to the military sector.

Cyclone Risks

Different components of climate change can also combine to form various manifestations that hold damaging impacts. Cyclones, stem from the intersection of different climate change manifestations and present an increasing likelihood of threatening the coast in different shapes and forms. Cyclone Yemyin resulted in major damages and Sindh's coastal belt is more susceptible to being affected by such events because of a low slope and due to its flat topography.³⁵ Furthermore, as part of the Arabian Sea coastal belt, Pakistan has a higher propensity to experience storms, especially during the summer season, which coincides with the periods of extreme heat and high daily average temperature.³⁶ The likelihood of increased cyclonic activity landing on Pakistan's coast is a result of rising ocean temperatures and a warming Arabian Sea, and these cyclones have the ability to cause serious damages. Given the all-encompassing nature and pervasive characteristics of both climate change and its threats, all security sectors are impacted. This includes military security; however, neglect of this threat nexus can give rise to vulnerabilities.

³² Planning Commission, "Task Force on Climate Change Final Report," Government of Pakistan, February 2010, 17.

³³ Naseem Abbas Gilani, "Degradation of Siachen Glacier in the Context of Volumetric Decrease in Siachen, Baltoro and Biafo Glaciers of Pakistan," *International Journal of Innovation and Applied Studies* 6, no. 4 (2014), 891.

³⁴ Asian Development Bank, "Climate Change Profile of Pakistan," 18; Dr. Moonis Ahmer, "Environment: Meltdown at Siachen," *Dawn*, October 22, 2017.

³⁵ M. M. Rabbani et al., "The Impact of Sea Level Rise on Pakistan's Coastal Zones in a Climate Change Scenario," National Institute of Oceanography, March 2008, 6; World Bank Group, "Climate Risk and Adaptation Country Profile: Pakistan."

³⁶ M. M. Rabbani et al., "The Impact of Sea Level," 6; World Bank Group, "Climate Risk," 3-6.

Direct Threats to Military Security

Sea Level Rise and Cyclones

Threats to naval assets and infrastructure in Pakistan occur simultaneously though sea level rise and an increased frequency and severity of climate change induced oceanic events such as cyclones. The US Central Command (CENTCOM), which includes Pakistan in its classification, has stated a high vulnerability to the naval infrastructure from sea level rise and severe events due to climate change.³⁷ Naval bases also directly face potential impact from sea level rise and given Sindh's topography as mentioned before, Pakistan's naval assets face direct threats.³⁸ Especially, the increased likelihood and projections of cyclonic activity that would land on Pakistan's coast, can create similar threats and damages. Damage to bases or related infrastructure could dampen or reduce their operational capacity, creating vulnerabilities and threats to military security.

Warming Patterns

Warming trends and increase in mean and daily average temperatures for Pakistan have resulted in a set of threats to military security. It must be noted that the likelihood of heat based extreme events that would occur each decade are projected to increase by 5.6 times globally even in modest warming scenarios.³⁹ Moreover, both Pakistan and India are positioned against each other on the highest militarised zone, so Pakistan's military faces the same threats as the Indian military. The first threat is glacial melting that puts the lives of troops and deployed forces at an increased risk. An ice avalanche caused the death of 10 Indian troops in 2018.⁴⁰ This event on the Siachen Glacier can be directly and unequivocally attributed to climate change. A similar but more drastic event happened in Pakistan. In 2012 when an ice avalanche hit a Pakistani base in Gayari sector in the northern glacial region that led to the death of 140 people out of which 120 were armed forced personnel.⁴¹ Although, the

³⁷ National Security, Military, and Intelligence Panel on Climate Change (NSMIP), "A Security Threat Assessment of Global Climate Change," 39.

³⁸ Global Military Advisory Council, "Climate Change: Implications for Defense," 8.

³⁹ Intergovernmental Panel on Climate Change, "Climate 2021: Physical Science," 18.

⁴⁰ The Economic Times, "Global Warming Making Siachen Riskier for Soldiers," *The Economic Times*, July, 2018, <https://economictimes.indiatimes.com/news/defence/-global-warming-making-siachen-riskier-for-soldiers/articleshow/53696876.cms>; Dr. Moonis Ahmer, "Environment: Meltdown at Siachen."

⁴¹ Inter Services Public Relations, "Press Release," Inter Services Public Relations, April, 2013, [https://ispr.gov.pk/press-release-detail](https://ispr.gov.pk/press-release-detail;).; Richard

incident cannot be directly attributed to climate change as no scientific research established the link but the role played by glacial melting and increased warming in the northern areas of Pakistan cannot be discounted. The Gayari avalanche also points to the kind of dangers and threats that can arise as per projections.

Glacial warming has also changed the operating environment for troops deployed on Siachen. Those changes include an increase in greenery on high altitudes, formation of crevices, and instances of rainfall which had not been experienced before by troops stationed on the Indian side.⁴² Particularly, crevices create deadly situations for troop movement. They also effect other operational issues like the deterioration of helipads and logistical dropping zones.⁴³ Moreover, mountain warfare as a whole can be affected due to difficulties in troop movement stemming from the unusual snow melt. These observations must be seen and analysed in tandem with the previously mentioned warming projections, specific to Pakistan's northern region. Thus, the above stated threats may only become worse for military security.

There have been other cascading impacts from the warming patterns and trends. Increase in extreme weather events and hot days threaten operational readiness and force capacity through their effects on military equipment and training abilities.⁴⁴ As a result both the Army and Air Force of Pakistan face threats. Fighter jet performance of even some of the most advanced air forces is hindered and periods of extreme heat reduce military training abilities.⁴⁵ Specifically, aircrafts are affected due to a reduced ability to carry payloads or travel the same distances with the same amount of fuel, necessitating more refuelling or shorter flying

Leiby, "Himalayan Avalanche Buried Scores of Pakistani Troops, Army Says," *The Washington Post*, July 4, 2012, https://www.washingtonpost.com/world/asia_pacific/

⁴² The Economic Times "Global Warming Making Siachen Riskier for Soldiers.," Dr. Moonis Ahmer, "Environment: Meltdown At Siachen."

⁴³ P.K. Gautam, "Changing Geographical Factors in Planning and Conduct of Indian Military Operations," *Strategic Analysis* 32, no. 2 (2008), 248, <https://doi.org/10.1080/09700160801994878>.

⁴⁴ Louise Schaik et al., "Ready for Take-off? Military Responses to Climate Change," Netherlands Institute of International Relations, The Hague, Clingendael, March, 2020.

⁴⁵ Louise Schaik et al., "Ready for Take-off? Military Responses to Climate Change," 7; P.K. Gautam, "Changing Geographical Factors in Planning and Conduct of Indian Military Operations," 249; Bruce Stanley, "US Military Destabilised by Climate Change in the Middle East," *Orient XXI*, June, 2021, <https://orientxxi.info/magazine/us-military-destabilised-by-climate-change-in-the-middle-east,4885>.

distances.⁴⁶ This could result in mission cancellation, strain crisis response, and dampen air force training potential.

Extreme heat days, heat waves, and an overall increase in higher mean and increasing daily maximum temperatures can make training activities and military machine movement for the army impractical and dangerous for their respective health and sustainability.⁴⁷ This has been highlighted in literature addressing climate change and geographical issues for the Indian military which means it has comparative applicability for Pakistan's military as well. Resultantly, mechanised operations can be impacted due to reduced functionality and added maintenance costs of mechanised weapon systems. As a consequence, military security is threatened through reduced crisis response abilities, operational readiness, and border patrolling capacity as some of the domains that are negatively affected.

It is important to note that Punjab and Sindh, as stated before, experience higher than average warming and extreme heat-based events.⁴⁸ Both of these provinces also house strategically important operational and forward military bases.⁴⁹ Due to the aforementioned impacts of warming and extreme heat, their training abilities and operational readiness will be threatened as well as Pakistan's overall military security; thus creating vulnerabilities that could be exploited by adversaries. While direct threats from climate change to military security are the most existential and potent, Pakistan also faces indirect threats in the light of its disproportionate risk to climate change induced disasters.

Indirect Threats to Military Security Severe and Frequent Flooding

Indirect threats from climate change to Pakistan's military security are also likely to impact operational readiness by reducing force capacity. Flooding risk and its impact creates these threats and the severity as well as increased frequency of disasters stems from intersecting climate change manifestations.⁵⁰ In any such disaster, the military of a country is often called for Humanitarian Assistance and Disaster Relief (HADR) efforts due

⁴⁶ "Climate Change Implications for U.S. Military Aircraft," Center for Climate and Security, 2019, 1-3.

⁴⁷ P.K. Gautam, "Changing Geographical Factors in Planning and Conduct of Indian Military Operations," 249.

⁴⁸ World Bank Group, "Climate Risk and Country Profile: Pakistan," 6.

⁴⁹ Lt. Gen. Prakash Katoch, "Nuclear Pakistan.," Global Security, "Pakistan Air Force Bases."

⁵⁰ World Bank Group, "Climate Risk Pakistan," 3; World Bank Group, "Climate Profile Pakistan," World Bank Group, 2021, 20.

to its institutional capabilities and quick response capacity.⁵¹ However, the increased frequency and intensity of climate change induced severe floods would even limit the military's capacity for HADR after a certain threshold.⁵²

Pakistan has experienced many floods since 2000 but the 2010 floods, due to their severity, provide an example for the reliance on the military for HADR efforts. The Armed Forces were crucial in initiating immediate rescue efforts and the resources used of the military included a significant number of helicopters, hovercrafts, boats, and numerous personnel in rescue relief teams as well as 10 air bases.⁵³ Therefore, the rate of involvement and resource use of the military will also increase resulting in stresses and reduction of force capacity and its dilution. These would combine to impact operational readiness and military security subsequently.

Addressing Climate Change Threats to Military Security in Pakistan

The identified climate change threats to military security must be addressed through substantive actions. This study, suggests a few of those actions and directional steps to the military sector as the primary stakeholder. The suggestions stem from the discussed understanding of the military sector where its primary responsibility is to protect the state from external and internal military threats in addition to non-military threats. The military is increasingly realising climate change as a threat to the existence of the state. It has signalled towards the importance of the environment in its operations through forestation efforts.⁵⁴ Such signs of its realisation indicate military's readiness to adopt measures to deal with the climatic threats to military security.

Recognition and Formalisation as a Military Security Threat: A primary issue in acting on climate change threats, regardless of the sector they threaten, is its acceptance and declaration as an existential security concern by the referent object which in this case is Pakistan's military sector. Its sector specific securitisation must be the first point of action for Pakistan's military. There is some work done in this regard which can be witnessed through different Inter Services Public Relations (ISPR) press

⁵¹ Shirley Scott and Shahedul Khan, "Implications Climate Change Military," 86; Louise Schaik et al., "Ready for Take-off? Military Responses to Climate Change," 25.

⁵² Centre for Climate and Security, "Climate Security 101," 4.

⁵³ National Disaster Management Authority, "Annual Report 2010," National Disaster Management Authority Pakistan, 2011, 17.

⁵⁴ Sarfraz Ali, "'Go Green Week': Pakistan Army to Plant 60,000 Trees in Cantonments," *Daily Pakistan*, March 16, 2016.

releases where Pakistan's navy has taken the lead in the matter.⁵⁵ However, similar actions must be taken from all the services of the military as none is immune. Currently, there is no formal institutional cell or department dedicated for this purpose in the military structure. The recognition of climate change as a threat to military security must be formalised through the creation of a climate security cell in the Joint Services Headquarter (JSHQ) of Pakistan military's institutional infrastructure. Formalisation under the JSHQ would allow for a wide-ranging acceptance of climate change as a threat to military security and subsequent substantive climate action.

Discourse Creation for Climate Security Action: There is an alarming discourse surrounding the nexus between climate change and military security in Pakistan despite the disproportionate risk it faces from climate change threats.⁵⁶ For this purpose, establishment of a think tank/research institute called Joint Services Climate Security Centre (JSCSC), under the JSHQ, with the scope of studying, understanding, and analysing climate change threats to the military sector of Pakistan and its security. The output should cover the entire range starting from reports, research papers, and books to round table discussions, webinars and international conferences. Due to the requirement of sector specific knowledge, JSCSC would require both military and climate change experts from both the public and private sector. Military experts should be inclusive of serving military personnel or recently retired ones, as operational experience is crucial for tangible climate security action in the context of military security.

Knowledge Sharing on Climate Security and Confidence Building: A regional climate security military summit or conference should be initiated, under the auspices of JSCSC, where military contingents or representatives along with climate change experts speak on how climate change can threaten military security and comprehensive security as a whole. Military to military contact on an academic level in regards to deal with the common adversary i.e. climate change, can start the process of bridging gaps and fostering confidence to ease tensions that have persisted between India and Pakistan in South Asia.

Climate Security Education for Military Officers: Military officers are required to complete both academic and military education throughout their career. Officers should complete their Staff Course and then a War Course at higher ranks, for which only a few are selected, but still

⁵⁵ Inter Services Public Relations, "Cns Message On The Occasion Of World Oceans Day - 2021," Inter Services Public Relations, June, 2021, <https://www.ispr.gov.pk/press-release-detail.php?id=6182>.

⁵⁶ David Eckstein, Vera Künzel, and Laura Schäfer, "Global Climate Risk Index 2021," 13.

constitute a significant percentage. The officers at the helm of affairs must be imparted knowledge about climatic threats to Pakistan's military security. This can be done through introduction of climate security courses as a part of their Staff Course and War Course education.

Data Monitoring and Technology Improvements for Climate Change Threats: Knowing the threats is necessary for protecting military security against them and requires enhanced climate change data monitoring capacity. Capacity building and technological improvements for Pakistan Meteorological Department's (PMD) early warning systems and data monitors that collect and analyse information related to the direct threats is required. Additionally, PMD's Glacier Monitoring unit should conduct regular and accurate studies to analyse volume loss, density loss, and crevice formation through advanced equipment and increased human resources with relevant expertise. This information can provide critical data for Pakistan Army's troop deployment in glacial regions and an information sharing mechanism or a collaborative framework should be established between PMD and JSCSC.

Conclusion

It is highly unlikely for one security sector to remain immune from another. In the case of the military sector and the environmental sector, their link is more impactful than usual. This link in Pakistan is manifested in climate change projections. These do not exist in isolation. Even within countries, there are variations on a geographical basis. Therefore, a country-specific view is useful and for Pakistan, it highlights certain trends, observations, and threats that will impact the military security. The most notable of these are drastic flooding risks, sea level rise, cyclone risks, and warming patterns of both frequency and severity in tandem with glacial melting. In Pakistan, flooding risks pose indirect threats, through force dilution from HADR stresses, while other climate change manifestations present direct threats.

Threats from climate change can directly impact naval assets and infrastructure through sea level rise and cyclone risks. Furthermore, threats from warming patterns that cause glacial melting impact troop movement, deployment, and logistics in Siachen. They also threaten military training and force capacity because of extreme heat related events. Warming patterns even reduce the operational readiness of the Pakistan Air Force by impacting aircraft and fighter jet performance. The most noteworthy part of these threats to military security in Pakistan is that they can be more intense in areas of strategic significance. This includes Siachen as the highest conflict zone, Sindh, and Punjab with important, operational, and forward military bases. In either case, direct or indirect threats, vulnerabilities are formed which could be exploited by adversaries. Collectively, there is a demonstrably observable link between

the underscored threats from climate change and Pakistan's military security. Climate change indeed endangers military assets and infrastructure, dilution of force capability, troop transportation and logistics, and operational preparedness.

There are some directional measures that can lead to further implementable steps address and reduce the threat impact from climate change to military security. The primary measure is the recognition of climate change as a strong impact factor to threaten military security directly and indirectly. This allows for subsequent action that aims to address that impact. To that effect, the paper suggests the creation of a climate security cell under JSHQ. In addition, there is a requirement of discourse creation for tangible and substantive climate security action that is well grounded in climate change realities and military security domains. For this purpose, the JSCSC is recommended to establish a think tank which involves both climate change experts and military officials (serving, retired, and civil/academic). Relatedly, better data monitoring through technology improvements is required in the PMD to identify climate change threats along with an information sharing mechanism with the JSCSC. The JSCSC is suggested to be used for Confidence Building Measures between India and Pakistan through regional climate security military conferences. Also, the paper suggests the inclusion of climate security courses in Staff Course and War Course curricula of the military academies so that officers receive training for additional preparedness in the changed environment in which their operations and duties will be conducted.

