

# Climate Security Index: Analysing South Asia's Climate Resilience

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March 2024

## Abstract

This paper provides an in-depth analysis of climate security in South Asia, a region significantly impacted by climate change. It evaluates active climate funding projects and policies in each South Asian country, highlighting the diverse challenges such as land, food, health, water, and energy security. The study presents a unique ranking of all the South Asian countries in terms of climate vulnerability and response. The paper explores the specific policies and actions each nation has undertaken, focusing on efforts like afforestation, enhancing food security, and developing sustainable energy practices. It examines Pakistan's collaborative work with international partners, showcasing how external support and expertise are utilised for effective climate security measures. The findings underscore a regional commitment to mitigate climatic disasters and build environmental resilience, offering insights into the complexities and collaborative efforts within South Asia's climate security landscape.

**Keywords:** Climate Security, Climate Funding, Environmental Resilience.

## Policy Recommendation

- Recognising climate change as a persistent and escalating issue, akin to a chronic health condition, it's vital for Pakistan to adapt its policies and infrastructure to be more resilient to mitigate climate change impacts. This includes preparing for increased temperatures, extreme weather events, and modifications in the agricultural sector.
- Pakistan should focus on setting clear and achievable goals for climate change mitigation. These goals should include saving lives, protecting property, safeguarding agriculture, ensuring food security, and maintaining economic growth. Ensuring sustainable development and poverty eradication should be integral to these goals.
- The current approach to climate policy in Pakistan lacks depth and coherence. There's a need for more intelligent and proactive policy-making that integrates climate considerations into all aspects of governance, moving away from an ad-hoc and fragmented approach.
- Drawing inspiration from global examples like the United States and China, Pakistan could focus on developing its solutions to climate-related challenges and possibly

exporting these solutions. This approach would reduce dependence on external funding and associate with national interests and global solutions.

- Pakistan could explore issuing green bonds to raise capital for environmentally friendly projects. Additionally, establishing a national climate fund could provide a dedicated source of financing for climate initiatives, with contributions from both domestic and international sources.
- Enhance the capacity of government institutions to access international climate finance mechanisms such as the Green Climate Fund, the Global Environment Facility, and the Adaptation Fund. This involves developing proposals that align with the criteria of these funds and building the necessary institutional and technical capacities.
- Promote climate change awareness among diverse groups, including the working class, students, and even schoolchildren, highlighting the potential hazards of climate change disasters. Additionally, engage these communities as partners in climate action initiatives.

## Introduction

Climate change is commonly called a "threat multiplier" or an "accelerator of instability" due to its impact on various pre-existing threats. For instance, increased temperatures and population growth affecting food shortage might trigger resource conflicts, driving human migration towards more resource-rich areas. (American Security Project, 2009). Climate security represents the physical, economic, or societal impacts associated with climate change that substantially alter political stability, human security, or national security infrastructure<sup>1</sup>.

Climate variability is highly impacting both natural and human systems. One of its numerous effects is the potential threat it poses to human security. The role of climate variability as a potential contributor to violent conflict has become a central topic in both public discourse and scientific discussions. Within the framework of the Climate Security Nexus, climate variability emerges as a multifaceted threat multiplier, intensifying the existing vulnerabilities of individuals and communities<sup>2</sup>.

Mitigation of Climate Change is the third part of the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) which provides an updated global evaluation of current and future emissions from various sources, suggests ways to reduce emissions or extract greenhouse gases, and assesses progress toward achieving climate goals. Greenhouse gas emissions in the past decade have hit unprecedented levels in human history. It underlines the need for immediate and substantial reductions across all sectors. Without swift action, limiting global warming to 1.5°C becomes nearly impossible and makes it more challenging to stay below the 2°C target. AR6 report shows the social and demand-side aspects of climate mitigation for the first time. The right policies, infrastructure, and technologies can significantly cut global greenhouse gas emissions. Importantly, these changes can also enhance overall well-being<sup>3</sup>.

Moreover, choosing agricultural and forest products sourced sustainably presents an alternative to utilising products that contribute more greenhouse gas (GHG) emissions

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<sup>1</sup> National, Pacific Northwest. Available at <https://www.pnnl.gov/climate-security>

<sup>2</sup> Index, C. s. (2023). Retrieved from The Alan Turing Institute: <https://www.turing.ac.uk/research/research-projects/climate-security-index>

<sup>3</sup> IPCC. (2022). Climate Change 2022: Mitigation of Climate Change.

in various sectors. Challenges in putting this into practice and potential drawbacks may arise due to climate change effects, conflicting land utilisation demands, issues related to food security and livelihoods, intricacies in land ownership and management systems, and cultural considerations<sup>4</sup>.

Evolving climate conditions are prompting increased human migration as people search for necessities such as food, water, shelter, and employment. The environmental changes are adding further strain to the stability of several countries. In South Asia, the melting Himalayan glaciers pose a significant risk to the freshwater supplies of over a billion individuals. On a global scale, major urban centres face the potential threat of rising sea levels. Additionally, the geographical spread of diseases like malaria and other illnesses is expanding, with outbreaks becoming more frequent due to planetary warming and alterations in weather patterns<sup>5</sup>.

## **Global Conflicts and Climate Change**

The conflict between Russia and Ukraine is causing interruptions in energy markets, destabilising international climate negotiations, and posing challenges to established laws regarding environmental protections in times of armed conflict. In addition to the environmental damage caused by Russia, both Ukrainian citizens and soldiers endure unimaginable issues<sup>6</sup>. The war has led to significant disturbance in global energy markets. Despite the United States and Europe getting away from Russian oil and gas in response to the invasion, Russia has identified new and receptive customers in China, India, Turkey, and the Global South<sup>7</sup>

The conflict in Ukraine has resulted in extensive deforestation and harm to the country's renewable energy infrastructure. Since the onset of the war, 90% of Ukraine has reduced its solar energy capacity and wind power by 50%. Increased military activities and a shortage of firefighters have contributed to a 25-fold rise in forest fires

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<sup>4</sup>IPCC. (2022). Climate Change 2022: Mitigation of Climate Change.

<sup>5</sup>Index, G. s. (2009). Retrieved from American Security Project: [globalsecuritydefenseindex.org](http://globalsecuritydefenseindex.org)

<sup>6</sup>Nations, U. (2023, 03 16). United Nation. Retrieved from <https://www.ohchr.org/en/press-releases/2023/03/war-crimes-indiscriminate-attacks-infrastructure-systematic-and-widespread>

<sup>7</sup>Montgomery, S. L. (2022, 03). War in Ukraine is changing energy geopolitics. Retrieved from <https://theconversation.com/war-in-ukraine-is-changing-energy-geopolitics-177903>

in 2022 compared to the previous year. This rise in forest fires has released substantial amounts of CO<sub>2</sub> and significantly reduced, future carbon sequestration efforts<sup>8</sup>.

The intersection of conflict and climate issues is apparent in the Gaza Strip. This isolated territory, home to 2 million people, faces imminent climate threats exacerbated by ongoing war and instability. An oasis between the Mediterranean Sea and arid deserts has been environmentally devastated due to the Israeli blockade and persistent conflicts. Gazans experienced an average of only four hours of electricity per day. A water treatment plant, bombed in 2014, frequently leaks raw sewage into the sea, and Gaza's over-exploited groundwater is now 97% undrinkable<sup>9</sup>.

Over the past few months, the killing of Palestinians has exceeded 17,000, with more than 7,000 children among the casualties. Thousands are still trapped. In the West Bank, the escalating violence from Israel has claimed the lives of at least 250 Palestinians. Activists have brought attention to the Palestinian cause at COP28 through demonstrations and panels, advocating for a ceasefire. They emphasise the connection between the struggle for climate justice and the ongoing 75-year-long Israeli occupation of Palestinian land<sup>10</sup>.

The Syrian conflict was also linked to the droughts experienced in the broader region during 2007-2010, which led to the forced displacement of approximately 1.5 million individuals to urban peripheries. This rapid demographic shift, coupled with deteriorating living conditions and a lack of government support, created an environment conducive to instability, social unrest, and ultimately, the eruption of a civil war<sup>11</sup>.

Significant casualties resulting from diseases, malnutrition, and natural disasters are a recurring annual concern. It is estimated that climate change contributes to an annual excess death toll of 400,000 in 2009, and this figure is projected to escalate to 700,000 by 2030, with a cumulative estimate reaching into the tens of millions by the

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<sup>8</sup>Brown, O. (2023, 03). Retrieved from Chatham house: <https://www.chathamhouse.org/2023/03/how-russias-war-ukraine-threatening-climate-security>

<sup>9</sup> Elgendy, K. (2023, 09 21). Climate casualties: How the Gaza war threatens Mideast climate action.

<sup>10</sup>Talaat, N. (2023, 12 11). COP28: How Israel's war on Gaza accelerates climate breakdown.

<sup>11</sup>Kelley CP, M. S. (2015). Climate change in the Fertile Crescent and implications of the recent Syrian drought. National Library of Medicine.

close of this century<sup>12</sup>. Traditionally, security predominantly revolved around military threats. However, contemporary interpretations have broadened their scope to encompass dimensions like poverty, health, education, political liberties, and democracy, thus adopting a more comprehensive yet, in the eyes of some scholars, somewhat ambiguous and potentially limited perspective<sup>13</sup>.

The conflicts in South Asia, arising from events like the U.S. post-9/11 intervention in Afghanistan and the Soviet military intervention in the 1979-80s, fall into one category. External influence, such as the 1962 Chinese war on India, also contributed to regional tensions. The Cold War's impact on South Asia, evident in conflicts like the Kashmir dispute, further deepened regional divides. Beyond direct contributions, global developmental and ideological issues, including the negative aspects of globalisation, have gradually added to South Asian conflicts, complicating internal and interstate issues<sup>14</sup>. Conflicts in South Asia, fall into four main categories: those driven by global political and strategic dynamics, those powered by internal political and socio-cultural issues, and those driven by non-state actors. The first category includes the conflicts between India and Pakistan, which hold significant importance. The second category encompasses various insurgencies and ethnic/sectarian conflicts in South Asia. The third category involves the actions of terrorist groups, exemplified by events like the 2008 attacks in Mumbai, India, or the activities of insurgent and criminal groups operating across borders in the region<sup>15</sup>.

The environmental conflict occurred during the first Gulf War when 700 oil fields in Kuwait were deliberately set on fire. The resulting smoke cloud initially spanned 800 miles, and approximately 11 million barrels of crude oil spilt into the Persian Gulf, creating a slick nine miles long. Inland, nearly 300 oil lakes formed on the desert surface, causing pollution that persists for decades. An international coalition of firefighters worked tirelessly for months to extinguish the fires, finally capping the last well in November 1991. However, more than 30 years later, the lingering effects

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<sup>12</sup>Nolt, J. (2015). Casualties as a moral measure of climate change. *Climate change*.

<sup>13</sup>Paris, R. (2001 ). *Human security: paradigm shift or hot air?* *International Security*.

<sup>14</sup>Werz, A. B. (2012, 12 3). *Climate Change, Migration, and Conflict in South Asia*. Retrieved from <https://americanprogress.org/article/climate-change-migration-and-conflict-in-south-asia/>

<sup>15</sup> Pachori, Dr. Sunita,. (2019). *Conflicts in South Asia – Challenges to SAARC Regionalism*

remain profound, with over 90 percent of the affected soil still exposed to contamination<sup>16</sup>.

International borders are disregarded by mountain ranges, river basins, and climate change. Despite this, nation-states assert territorial sovereignty to lay claim to natural resources within their borders. This dynamic increases the risk of interstate conflicts over resources due to the impacts of global warming, climate catastrophes, and glacier melt. These factors make regions, including South Asia, susceptible to floods, droughts in the short and medium term, and the potential drying of rivers in the long term<sup>17</sup>.

Simultaneously, territorial disputes that were previously relatively dormant between India and Pakistan, as well as China and India, have gained increased prominence following New Delhi's unilateral decision to revoke Kashmir's autonomous status on August 5, 2019<sup>18</sup>. Disputes between India and Pakistan over Jammu and Kashmir, Ladakh, and Gilgit-Baltistan, alongside India and China contesting border claims in Aksai Chin and Ladakh, have heightened the region's political significance<sup>19</sup>.

The COP28 Declaration presents a non-binding appeal, compelling governments, international organisations, financial institutions, and various stakeholders to collaboratively address climate resilience in exceptionally vulnerable countries and communities. This call to action is particularly directed towards those allocating with the dual challenges of conflict and severe humanitarian needs<sup>20</sup>.

The potential ramifications of climate change on national security are of significant concern. National security, extending beyond traditional notions of safety and conflict, assumes a broader perspective that incorporates the people's well-being, which may face threats such as extreme weather events, ocean acidification, or rising sea levels. Nonetheless, the comprehension of national security predominantly remains a qualitative concept. Therefore, there is a crucial need to establish a quantitative

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<sup>16</sup>UNCCC., (2022). Conflict and Climate

<sup>17</sup>Bolch, T. S. (2019). Status and change of the cryosphere in the extended Hindu Kush Himalaya region. The Hindu Kush Himalaya Assessment: Mountains, climate change, sustainability and people.

<sup>18</sup>JAZEERA, A. (2019, 08 5). Retrieved from India revokes disputed Kashmir's special status with rush decree: <https://www.aljazeera.com/news/2019/8/5/india-revokes-disputed-kashmirs-special-status-with-rush-decree>

<sup>19</sup>Siddiqui, N. (2020, 08 04). In a landmark move, PM Imran unveils a 'new political map' of Pakistan. Retrieved from Dawn News: <https://www.dawn.com/news/1572590>

<sup>20</sup> [https://unfccc.int/sites/default/files/resource/Summary\\_GCA\\_COP28.pdf](https://unfccc.int/sites/default/files/resource/Summary_GCA_COP28.pdf)



framework for its definition and to evaluate the influence of climate change on national security mathematically. Such an undertaking should encompass both analytical and normative dimensions of climate security.

Climate change endeavours its influence across numerous societal domains. Various scholars have investigated the intricate interconnections between climate change and armed conflicts, while others have concentrated on nonmilitary threats<sup>21</sup>. Another emerging facet of climate security involves the creation of climate vulnerability maps at the local level employing Geographic Information Systems (GIS) to chart climate change-related hazards<sup>22</sup>.

Human activities, notably the combustion of fossil fuels and deforestation, have made substantial contributions to carbon emissions. These activities have unleashed greenhouse gases (GHGs) into the atmosphere, leading to a 1.1°C increase in global temperatures since 1850<sup>23</sup>. Furthermore, projections are indicating that global average temperatures are poised to surpass the 1.5°C threshold within the next two decades. Such a 1.5°C temperature rise would exacerbate an ecosystem already under strain, resulting in a proliferation of extreme weather events that, in turn, contribute to environmental degradation, loss of biodiversity, food insecurity, and widespread human displacement<sup>24</sup>. The ramifications of climate change are far-reaching, affecting virtually every aspect of life on Earth. The anticipated uptick in the frequency and intensity of extreme weather events carries devastating consequences for communities worldwide, with South Asia being particularly susceptible<sup>25</sup>.

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<sup>21</sup> Adger et al., (2014). Human Security. Contribution of working group II to the fifth assesment report of IPCC

<sup>22</sup> Thow A, d. B. (2008). Climate Change and Human vulnerability: mapping emerging trends and risk hotspots for humanitarian actors. Report to the UN Office for coordination of humanitarian affairs

<sup>23</sup> IPCC. (2021). Cambridge University Press In Press

<sup>24</sup> Heshmati, E. ( 2021.). Impact of climate change on life. Environmental issues and sustainable development, 1-20.

<sup>25</sup> IPCC. (2022). Cambridge University Press.

## Climate security and south Asia

Although South Asian countries have contributed a disproportionately low share of global GHG emissions, they find themselves among the countries most severely impacted by the consequences of climate change<sup>26</sup>.

Climate change poses a significant threat to the South Asian regions, primarily driven by the merging of rising sea levels and extreme weather events. The vulnerability is heightened by the presence of densely populated urban areas situated in low-lying coastal zones. The South Asian region has been notably vocal about the imminent threat of climate change, with some of them actively anticipating the possibility of their land masses disappearing. More developed militaries in the surrounding boundary, such as Australia, Singapore, Vietnam, and New Zealand, anticipate that the impacts of climate change will extremely affect this region. Consequently, they are actively preparing for disaster response and conflict prevention across the entire region<sup>27</sup>.

Global conflicts have nearly doubled, increasing from thirty to fifty-six in numbers, leading to the flourishing of the war industry from 2010 to 2020. The production of war machines, military exercises, and defence infrastructures requires vast amounts of natural resources and plays a significant role in contributing to climate breakdown. Worldwide militaries stand as the largest industrial polluters, responsible for emitting 2,750 million tonnes of carbon dioxide, accounting for 5.5% of all greenhouse gas emissions<sup>28</sup>.

The contested status of the Himalaya-Karakoram-Hindukush highlands and the difficult living conditions for mountain communities have resulted in underdevelopment compared to the mainland areas of Pakistan, China, and India. To address the challenge of climate change in South Asia, the most immediate and practical measure is to demonstrate political determination in building a shared consensus to enhance environmental resilience in mountain communities and alleviate potential downstream conflicts through conflict resolution.

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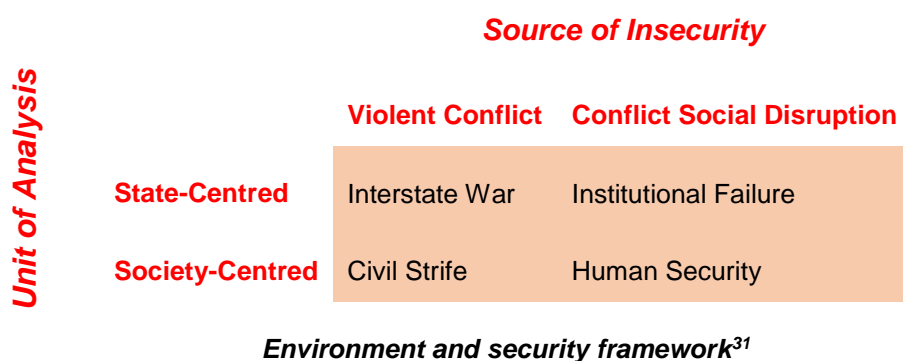
<sup>26</sup> Aryal, J. S.-C. ( 2020). Climate change and agriculture in South Asia: Adaptation options in smallholder production systems. *Environment, Development and Sustainability*, 22(6), 5045-5.

<sup>27</sup> American Security project., (2009). [globalsecuritydefenseindex.org](http://globalsecuritydefenseindex.org)

<sup>28</sup> Talaat., (2023). COP28: How Israel's war on Gaza accelerates climate breakdown

The mountainous regions of the Himalaya-Karakoram-Hindukush (HKH) are under dispute and stretch across South Asia, including Ladakh, Aksai Chin, Jammu and Kashmir, and Gilgit-Baltistan. These areas face significant risks from both climate change and potential conflicts. Often referred to as the world's third pole, these highlands hold more ice in their glaciers than any other place except Antarctica and the Arctic<sup>29</sup>. The well-being of nearly two billion people in Pakistan, India, Afghanistan, and China is intricately tied to the freshwater resources originating from the Himalaya-Karakoram-Hindukush Mountain ranges. Undoubtedly, the significance of these mountains for South Asia cannot be overstated.

The framework explains the various sources of insecurity and the unit of analysis in the discussion of environment and security. It suggests that insecurity can emerge from social disruptions at the level of the state, leading to institutional failure and a focus on the mechanisms of societal governance. The framework also conveys that the environment-security issue is composed of multiple forms of insecurity, with a predominant emphasis on environment-related insecurities as manifest in social disruption rather than outright conflict. The categories in the framework are broad and are based on the findings from country-focused and issue-focused studies from South Asia<sup>30</sup>.



Chronic and structural impoverishment, rather than mere resource scarcity, establishes the link between environmental degradation and conflict. In the context of

<sup>29</sup>Sharma, E. M. (2019). Introduction to the Hindu Kush Himalaya assessment. The Hindu Kush Himalaya Assessment: mountains, climate change, sustainability and people.

<sup>30</sup> Najam, A. N. (2003). The human dimensions of environment environmental insecurity al insecurity al insecurity: some insights from south asia. Environmental change & security project report.

<sup>31</sup> Framework illustrates an arena of environment and security, delineated on one axis by the unit of analysis (spanning from state-centered to society-centered) and on the other by the origins of insecurity (spanning from violent conflict to social disruptions).

South Asia, environment and security are best approached through the lens of sustainable development. The challenge of environment and security in South Asia primarily exists at the domestic level but is shared across the region. This challenge is fundamentally rooted not only in resource endowments or geography but also in issues of institutions and governance, e.g., The Honeymoon Hotel was rebuilt in Swat after it collapsed due to the 2006 flood in Pakistan. It collapsed again in the 2014 flood and rebuilt again. It again collapsed due to the flood of 2022 along with the breaking of all the rules and regulations of Pakistan's law which is an absolute institutional failure<sup>32</sup>. The likelihood of interstate violence over environmental matters in South Asia is low, historical distrust and disputes suggest that environmental differences can heighten existing tensions and perpetuate a general sense of insecurity in interstate relations. There is a modest potential for a new generation of security relations in the region, centred around the intersection of environment and security, and built on principles of mutual trust, harmony, and cooperation, rather than the legacies of distrust and dispute<sup>33</sup>.

Pakistan's all-encompassing national security faces a significant threat from the adverse consequences of extreme weather events spanning various sectors. It's no longer a question of economic security versus conventional security. National security must not be viewed through an either/or lens because it encompasses all elements and resources that empower the state to pursue its interests. Consequently, these elements, resources, and sectors collectively constitute the nation's security. Addressing the array of multifaceted threats necessitates a holistic perspective of national security, with equal attention to all sectors. This approach should prioritise climate security due to its seriousness and immediate relevance. Although the national security policy initiated this discourse officially, its emphasis on the environmental sector fell short of adequately recognising the gravity of the threat to national security<sup>34</sup>.

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<sup>32</sup>Najam, D. A. (2024). Climate change and conflict.

<sup>33</sup>Najam, A. N. (2003). The human dimensions of environment environmental insecurity al insecurity al insecurity: some insights from south asia. Environmental change & security project report.

<sup>34</sup>Ameera Adil, F. H. (2022). Pakistan Floods & Climate Security: Rethinking Comprehensive National Security. South Asian Voices.

Over the last ten years, Pakistan has seen a notable increase in violence, both in terms of how often it occurs, the areas it affects, and its severity. The reasons behind this violence differ depending on the region, involving both longstanding conflict participants and newly emerged groups. The most intense violence is concentrated along the Afghan border, particularly in the Federally Administered Tribal Areas (FATA) and the province of Khyber Pakhtunkhwa (KP). Other regions, such as Balochistan and Gilgit-Baltistan, which share a border with Afghanistan, have also witnessed a significant rise in violent incidents. This escalation can be attributed, at least in part, to the collaboration between sectarian militants and terrorist organisations<sup>35</sup>.

In Karachi, most of the violence is centred, and it experienced a tenfold increase in violent incidents from 2006 to 2013. The security situation in the city has become more intricate over the years due to the involvement of various actors, such as sectarian militant groups, terrorist organisations, political parties, and criminal gangs. Balochistan, the largest province in Pakistan in terms of territory, continues to face an unparalleled and unremitting level of violence. The province is grappling with the combined challenges of sectarian and terrorist activities, particularly targeting the Shia Hazara community, and a high-intensity conflict between a secessionist insurgency and the military that has been ongoing since 2006<sup>36</sup>. The direct and indirect security threats posed by climate change can result in significant economic losses for Pakistan. There is a growing body of evidence suggesting a connection between climate change and conflicts in the country. Factors like resource depletion and overpopulation contribute to rural-to-urban migration and changes in occupations<sup>37</sup>.

In Pakistan, the persistent floods have caused widespread devastation, impacting both the economy and infrastructure. The country now grapples with environmental security and economic hurdles. Between 2010 and 2022, Pakistan experienced numerous floods, with climate change worsening the situation. The current floods exhibit a 5.6 times increase and a 371% rise in rainfall compared to previous years. While there are similarities with past events, climate experts highlight substantial differences that

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<sup>35</sup>Yamin, S., & Malik, S. (2014). Mapping Conflict Trends in Pakistan. United States Institutes of Peace.

<sup>36</sup>Yamin, S., & Malik, S. (2014). Mapping Conflict Trends in Pakistan. United States Institutes of Peace.

<sup>37</sup>Ali, F. K. (2018). Climate change-induced conflicts in Pakistan: from national to individual level. Earth Systems and Environment.

authorities must consider. The 2010 disaster was attributed to riverine floods resulting from exceptionally heavy rainfall in northern Pakistan during July<sup>38</sup>.

The National Security Policy (NSP) 2022-2026 stands as Pakistan's national security document. Unlike past approaches, this policy centres around a 'Comprehensive National Security' framework that prioritises the well-being of its citizens. It acknowledges that a mix of conventional and unconventional threats, alongside opportunities, collectively affects the country's overall security. What sets this policy apart is its focus on economic security as the linchpin of national security. It promotes a geo-economic vision, complementing the traditional geo-strategic emphasis<sup>39</sup>. Notably, climate resilience finds a place in Pakistan's national security policy for the first time. The policy aims to integrate climate adaptation and response, especially in regions facing socio-economic vulnerability, steering Pakistan toward development that is resilient to climate challenges<sup>40</sup>.

## **Conceptual Framework**

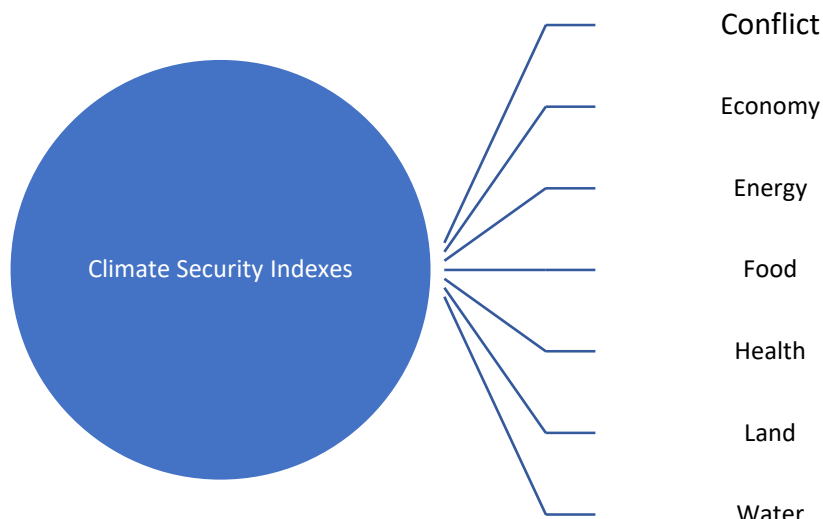
Climate change is a significant concern for both national and global security, as well as the well-being of individuals. It has the potential to deteriorate the issues related to food, water, and livelihood security, causing a chain reaction of problems like heightened competition for natural resources, disturbances in society, and population displacement. Climate security indexes are based on seven different factors including Conflict, Economy, Energy, Food, Health, land, and water. The conceptual framework will give a comprehensive and transparent image of the factors affecting climate security indexes.

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<sup>38</sup>Salman, A. (2022). Broken Bridges: The climate change dilemma in Pakistan. Global Village Space.

<sup>39</sup> National Security Policy of Pakistan (2022-2026)

<sup>40</sup> National Security Policy of Pakistan (2022-2026)



Source: Author's Construct

## Data and Methodology

The data utilised in this study has primarily been sourced from World Development Bank indicators (Bank, 2020). Specific data points are drawn from the International Monetary Fund (2022)<sup>41</sup> and select information from Pakistan's dataset is collected from the Ministry of Finance<sup>42</sup> and the Ministry of Health (2022). For Maldives and Bhutan, this paper relies on data provided by their respective Bureau of Statistics (2022)<sup>43</sup> for economic and land-related statistics<sup>44</sup>.

Indexes	Variables
Conflict Index	Armed forces personnel, Arms imports total, Gini index, Political Stability, and Absence of Violence/Terrorism
Economy Index	Cause of death, Cause of death, Population, total GDP per capita, Inflation, Central government debt, Bank liquid reserves to bank assets ratio, Foreign direct investment, Losses due to theft and vandalism, Firms experiencing losses due to theft and vandalism, Poverty gap, CPIA transparency, accountability, and corruption in the public sector rating, and Control of Corruption.

<sup>41</sup> IMF., 2022. World Economic Outlook. Retrieved from <https://www.imf.org/en/Publications/WEO/weo-database/2022/October>

<sup>42</sup>Pakistan Economic survey., 2022. Available at [https://www.finance.gov.pk/survey/chapters\\_23/Highlights.pdf](https://www.finance.gov.pk/survey/chapters_23/Highlights.pdf)

<sup>43</sup>Bureau of Statistics Nepal. Available at: <https://ghdx.healthdata.org/organizations/central-bureau-statistics-nepal>

<sup>44</sup>Bureau of Statistics Maldives. Available at: <https://statisticsmaldives.gov.mv/>

Energy Index	Renewable energy consumption, Energy intensity level of primary energy, Energy use, Energy imports, and Access to electricity.
Health Index	Cause of death, Cause of death, Hospital beds, Physicians, GDP per capita, Population total, ARI treatment, Births attended by skilled health staff, and Community health workers.
Land Index	Land area where elevation is below 5 meters, Agricultural land, Rural land area where elevation is below 5 meters, Urban land area where elevation is below 5 meters, and GDP per capita.
Water Index	Average precipitation in depth, Droughts, floods, extreme temperatures, Rural land area where elevation is below 5 meters, Annual freshwater withdrawals, total, Water productivity, People using at least basic drinking water services, Forest area, and Forest rents.
Food Index	Cereal yield, Rural population living in areas where elevation is below 5 meters, Agricultural irrigated land, Food production index, Population growth, and GDP per capita.

Principal component analysis (PCA) is a method used to reduce the dimensionality of high-dimensional data by capturing the relationships between variables and representing the data in a more manageable, lower-dimensional. PCA is a straightforward and reliable technique for dimensionality reduction, and despite its age, it has been rediscovered multiple times across various fields. PCA is also used for constructing an index by using different variables without losing the authenticity of the variables<sup>45</sup>. To assess climate security in the South Asian region, this paper employs principal component analysis to construct indexes related to land, food, health, water, economy, energy, conflict, and emissions. Subsequently, the mean values of these indexes are computed to determine the countries with higher climate security scores. Furthermore, the study evaluates the impact of these indexes on climate vulnerabilities, ultimately establishing the ranking of countries through a simple regression analysis.

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<sup>45</sup> <https://www.stat.cmu.edu/~cshalizi/uADA/12/lectures/ch18.pdf>



## Results

The mean values for the land, food, health, water, economy, energy, and conflict indexes, provide an overview of each country's vulnerability as assessed through these indexes.

Countries	Conflict	Economy	Energy	Food	Health	Land	water
<b>Pakistan</b>	-1.190	-0.23	-.148	-.221	-.171	-.080	-1.45
<b>Bangladesh</b>	-3.17	-5.96	-3.84	-2.09	-9.34	-7.15	-3.84
<b>Bhutan</b>	-3.58	-9.05	-4.61	-1.79	-8.34	-3.81	-1.80
<b>India</b>	-2.83	-1.91	-2.97	-3.76	-6.68	-4.77	-4.25
<b>Maldives</b>	-5.30	-4.41	-1.13	-3.01	-2.88	-3.10	-8.00
<b>Nepal</b>	-1.13	-2.26	-4.59	-7.75	-1.91	-2.49	-6.60
<b>Sri Lanka</b>	-5.39	-1.19	-4.07	-4.04	-2.38	-2.38	-8.94
<b>Afghanistan</b>	-8.34	-2.15	-2.86	-1.25	-9.54	-1.55	-1.19
<b>Author's Calculation</b>							

### Countries ranking of climate Security Indexes

Countries	Values	Ranking
Bangladesh	0.871	1 <sup>st</sup>
Afghanistan	0.868	2 <sup>nd</sup>
<b>Pakistan</b>	<b>0.865</b>	<b>3<sup>rd</sup></b>
India	0.840	4 <sup>th</sup>
Maldives	0.837	5 <sup>th</sup>
Bhutan	0.833	6 <sup>th</sup>
Sri Lanka	0.809	7 <sup>th</sup>
Nepal	0.51	8 <sup>th</sup>
<b>Author's Calculation</b>		

Countries were ranked based on their climate vulnerabilities across all the indexes, with higher values indicating higher climate vulnerability and lower values representing substantial climate security. As depicted in the table above, Bangladesh emerges as the country with the highest climate vulnerability, while Nepal is positioned at the lowest end of the spectrum. Pakistan is placed third in this ranking, with a value of 0.865. This scenario exemplifies Pakistan's predicament as a nation that is not a significant greenhouse gas emitter yet bears the effect of global emissions. The carbon surplus has wide-ranging repercussions for Pakistan, manifesting as reduced agricultural productivity, water scarcity, coastal erosion, and extreme climatic events. These challenges exert immense pressure on its economic stability and, in turn, exacerbate tensions related to ethnicity, gender, religion, and more. Given its existing economic vulnerabilities, any sudden resource scarcity could escalate violence, posing a significant threat to national security. Consequently, addressing climate-related risks necessitates the integration of a national security policy with climate-resilient strategies in infrastructure, businesses, and workforce development<sup>46</sup>. Afghanistan is at 2<sup>nd</sup> in the climate security index. After four decades of conflict, Afghanistan is now dealing with economic collapse, climate-related disasters, and extensive climate insecurity. Recognising the interconnected nature of these intricate challenges is essential for implementing precise solutions to the climate crisis. This recognition is critical not only for building sustainable peace but also for fostering long-term development<sup>47</sup>. India is in 4<sup>th</sup> place. The Maldives holds the 5<sup>th</sup> position, while Bhutan and Sri Lanka are positioned at the 6<sup>th</sup> and 7<sup>th</sup> places, respectively. The COP28 Declaration on Climate, Relief, Recovery, and Peace was also an achievement this time. It presents a non-binding agreement for governments, international organisations, financial institutions, and other stakeholders to collaboratively address climate resilience in extremely vulnerable countries and communities. This is particularly crucial for those impacted by conflict and facing severe humanitarian needs<sup>48</sup>.

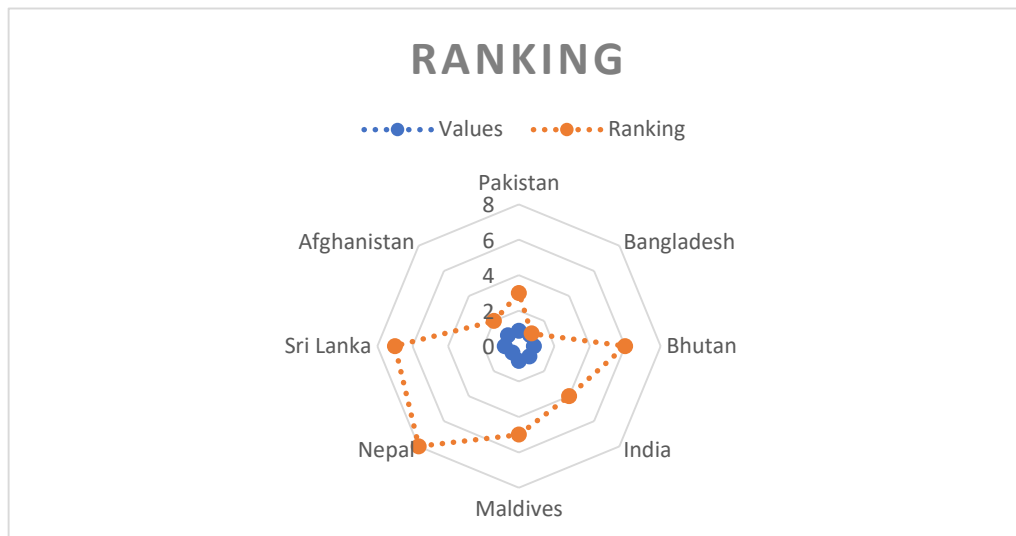
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<sup>46</sup>Talal, S. (2020). Climate security of Pakistan: dissecting the carbon dilemma. Margalla Papers, pp.97-111.

<sup>47</sup> [https://www.afghanaid.org.uk/news/cop28-key-takeaways-from-this-years-climate-change-conference?gclid=Cj0KCQiAv8SsBhC7ARIsALikVT1Uuy3IE7QTVDMxD-BLcKm5yvPwOLRs70tpwzBQ9bG9mMeNcqf\\_sogaAlchEALw\\_wcB](https://www.afghanaid.org.uk/news/cop28-key-takeaways-from-this-years-climate-change-conference?gclid=Cj0KCQiAv8SsBhC7ARIsALikVT1Uuy3IE7QTVDMxD-BLcKm5yvPwOLRs70tpwzBQ9bG9mMeNcqf_sogaAlchEALw_wcB)

<sup>48</sup> [https://unfccc.int/sites/default/files/resource/Summary\\_GCA\\_COP28.pdf](https://unfccc.int/sites/default/files/resource/Summary_GCA_COP28.pdf)

## Graphical representation



**Source: Author's Contract**

The radar chart visually represents the ranking of South Asian countries based on their climate security indexes, with scores ranging from 0 to 1. Countries closer to zero hold higher ranks, while those farther from zero have lower ranks. The severity of the climate change issue was consistently underestimated, and insufficient attention was directed towards mitigating this growing threat. The consequences of extreme weather events, conflict situations, emissions from the energy sector, and the interplay with food security became evident as human lives were lost, and climate stability was frequently disrupted in regions prone to weather-related disasters. Moreover, one of the first times at COP 28, The acknowledgement of interconnected challenges, including climate change, conflict, instability, and humanitarian crises, was a vital discussion. These challenges extremely affect women, children, indigenous populations, and individuals with disabilities. To tackle these inequalities within conflict-affected communities, the declaration promotes investment in climate adaptation programs. These programs should be updated by the needs of vulnerable populations, incorporate conflict-sensitive approaches, and highlight the significance of adaptability in implementing effective solutions.

### **Climate change policies in South Asia region:**

South Asia includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, with a vast population of 1.85 billion as of 2020 (Bank,

2020)<sup>49</sup>. This region boasts diverse landscapes, from the towering Himalayan peaks to fertile plains, forests, and coastal cities. Due to its unique characteristics and geographical positioning, South Asia is highly susceptible to natural disasters and climate-induced difficulties. The Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)<sup>50</sup> underscores the challenges anticipated in the coming years, including rising temperatures that may elevate the risk of prolonged heat waves, leading to droughts in arid and semiarid areas, monsoon disruptions, monsoon-related floods, and glacier melting across Asia. The impacts of climate change are already manifesting in this region, affecting various aspects, such as food availability, water resources, health, well-being, and extreme weather events. The table provides an overview of climate change policies implemented by South Asian countries as they strive to address climate change within their respective capacities and align with the objectives outlined by the UNFCCC and SDGs. Notably, a recurring trend across all South Asian nations is the absence of climate security considerations within their policy frameworks, a crucial component for effectively addressing sustainability concerns.

Country	Climate change Strategies	Predominant references to CC	Climate Security
<b>Afghanistan</b>	Disaster Management Strategy, 2014  National Environment Strategy (NES), 2007	Climate Change Adaptation, Climate Change Mitigation, and GHG Mitigation.  Environmental education and building capacity and resilience at a local level	Not Mentioned
<b>Bangladesh</b>	National Plan for Disaster Management, 2017 <sup>51</sup>	Viable path to climate-resilient development, reduced climate risks and vulnerabilities through effective adaptation strategies	Not Mentioned

<sup>49</sup> The World Bank (2020) Population: South Asia. Retrieved 15 February from <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=8S>

<sup>50</sup> Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) 2022.

<sup>51</sup> [https://modmr.portal.gov.bd/sites/default/files/files/modmr.portal.gov.bd/policies/0a654dce\\_9456\\_46ad\\_b5c4\\_15ddfd8c4c0d/NPDM\(2016-2020\)%20-Final.pdf](https://modmr.portal.gov.bd/sites/default/files/files/modmr.portal.gov.bd/policies/0a654dce_9456_46ad_b5c4_15ddfd8c4c0d/NPDM(2016-2020)%20-Final.pdf)

	Climate Change Strategy and Action Plan, 2008 <sup>52</sup>		
<b>Bhutan</b>	National Environment Strategy, 2020 <sup>53</sup>  Climate Change Policy of the Kingdom of Bhutan, 2020 <sup>54</sup>	Carbon neutrality, building resilience to climate change, means for implementation, and effective and coordinated actions	Not Mentioned
<b>India</b>	NDC, 2016 <sup>55</sup>  National Action Plan on Climate Change (NAPCC), 2009 <sup>56</sup>	Research and communication-based actions.  adapt to climate change and enhance the ecological sustainability of India 's development path	Not Mentioned
<b>Maldives</b>	Maldives Climate Change Policy Framework (MCCPF), 2015 <sup>57</sup>	Fostering and guiding a national action plan against short-term and long-term effects of climate change and setting out strategic priorities in response to climate change	Not Mentioned
<b>Nepal</b>	National Climate Change Policy, 2020 <sup>58</sup>	To enhance climate change adaptation capacity  To promote a green economy by adopting the concept of low-carbon emission development  To build resilience of ecosystems that are at risk of adverse impacts of climate change	Not Mentioned

<sup>52</sup>[https://policy.asiapacificenergy.org/sites/default/files/Bangladesh%20Climate%20Change%20Strategy%20and%20Action%20Plan\\_reduced\\_0.pdf](https://policy.asiapacificenergy.org/sites/default/files/Bangladesh%20Climate%20Change%20Strategy%20and%20Action%20Plan_reduced_0.pdf)

<sup>53</sup><https://policy.asiapacificenergy.org/sites/default/files/National%20Environment%20Strategy%202020%20%28EN%29.pdf>

<sup>54</sup><https://www.gnhc.gov.bt/en/wp-content/uploads/2020/02/Climate-Change-Policy.pdf>

<sup>55</sup><https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf>

<sup>56</sup><https://dst.gov.in/climate-change-programme>

<sup>57</sup>[https://www.unisdr.org/preventionweb/files/39744\\_maldivesclimatechangeandpolicyframework.pdf](https://www.unisdr.org/preventionweb/files/39744_maldivesclimatechangeandpolicyframework.pdf)

<sup>58</sup>[https://mofe.gov.np/downloadfile/climatechange\\_policy\\_english\\_1580984322.pdf](https://mofe.gov.np/downloadfile/climatechange_policy_english_1580984322.pdf)

<b>Pakistan</b>	National Climate Change Policy (NCCP), 2021 <sup>59</sup>	Promotes sustainable adaptation, capacity building, and institutional strengthening.	Not Mentioned
	Pakistan's 2025 Vision <sup>60</sup>	Pursue sustained economic growth by addressing the challenges of climate change.	
	Climate Change Policy, 2012 <sup>61</sup>		
<b>Sri Lanka</b>	National Climate Change Policy of Sri Lanka, 2012 <sup>62</sup>	Take adaptive measures to avoid/minimise adverse impacts of climate change on the people, their livelihoods, and ecosystems.  Mitigate greenhouse gas emissions in the path of sustainable development.  Promote sustainable consumption and production.	Not Mentioned

## Climate Financing in the South Asian Region

Addressing climate change and steering towards a sustainable future necessitates not just innovative solutions but also the essential financial resources for their execution. The unlocking of climate finance plays a decisive role in realising the ambitious climate objectives outlined in the Paris Agreement. However, the UNFCCC's Standing Committee on Finance has emphasised that developing countries will require an approximate sum of US\$6 trillion by 2030 to effectively execute their climate action plans. Presently, it is obvious that developed nations have yet to fully meet their committed US\$100 billion funding obligation, intensifying the challenges faced by developing countries in this regard.

Climate finance is a key driver in the pursuit of climate and security goals. As per the World Bank's assessment, Pakistan is confronted with the daunting requirement of US\$348 billion by 2030 to fortify its climate resilience. In the absence of substantial investments, the looming threat of climate change poses an escalating risk to the

<sup>59</sup> <https://www.mocc.gov.pk/SitelImage/Policy/NCCP%202021.pdf>

<sup>60</sup> <https://www.pc.gov.pk/uploads/vision2025/Pakistan-Vision-2025.pdf>

<sup>61</sup> <https://mocc.gov.pk/SitelImage/Policy/NCCP%20Report.pdf>

<sup>62</sup> [https://www.climatechange.lk/CCS%20Policy/Climate\\_Change\\_Policy\\_English.pdf](https://www.climatechange.lk/CCS%20Policy/Climate_Change_Policy_English.pdf)

nation. The insufficiency of financial resources to effectively address climate-related challenges could potentially act as a catalyst towards increased instability.

The GCF has rapidly expanded its operations, delivering innovative climate crisis solutions across more than 100 countries. GCF's activities are characterised by their global reach, encompassing a multitude of countries, diverse financing mechanisms, a broad array of strategic focus areas, and a comprehensive spectrum of initiatives aimed at both mitigation and adaptation. GCF establishes direct partnerships with nations grappling with the consequences of climate change, working closely with a country's National Designated Authority (NDA) or Focal Point (FP), which are government agencies entrusted with liaising with GCF to implement climate solutions.<sup>63</sup> The table provided offers an overview of the climate finance received by South Asian countries, along with the number of ongoing projects, as well as an account of climate finance from Multilateral Development Banks in the South Asian region from 2015 to 2021.

Country	2015	2016	2017	2018	2019	2020	2021	CF	GFC <sup>64</sup>	GFC Projects
<b>Afghanistan</b>	0	173	147	144	281	65	485	1295	17.2	1
<b>Bangladesh</b>	899	1315	200	1296	2144	1127	732	7713	441.2	9
<b>Bhutan</b>	2	17	7	4	2	20	24	76	51.9	2
<b>India</b>	1948	3017	2678	3703	3671	3549	3735	22301	542.3	9
<b>Maldives</b>	5	35	19	2	2	148	83	294	52.4	3
<b>Nepal</b>	567	111	204	435	252	1022	280	2871	87.8	3
<b>Pakistan</b>	1162	673	1018	1305	1294	944	2704	9099	197.0	6
<b>Sri Lanka</b>	84	212	574	72	604	192	87	1825	105.8	5
All values are in USD Million										

<sup>63</sup> Green Climate Fund. Available at <https://www.greenclimate.fund/countries>

<sup>64</sup> Green Climate Fund. Available at <https://www.greenclimate.fund/countries>

Notably, India stands out as the largest recipient, securing 50% of the total financing allocated to the region, amounting to USD 22,301 million. The remaining seven countries collectively share the remaining 50%, amounting to USD 23,044 million. India, Pakistan, and Bangladesh emerged as the top three countries, collectively accounting for USD 39,113 million, representing a substantial 86% of the total climate finance in the South Asian region.

The table also underscores the significant disparity in the allocation of climate finance to the region, with the remaining five countries collectively receiving a mere 14%, equivalent to USD 6,232 million. Furthermore, Afghanistan, Bhutan, and the Maldives received less than 3% of the total funding, highlighting the disproportionate and unequal distribution of climate finance by Multilateral Development Banks within the region. This disparity may be attributed to factors such as institutional effectiveness and climate politics. Additionally, the data points towards issues related to capacity building, technical inefficiency, and the region's inability to effectively advocate climate-related challenges on both regional and international platforms. It also raises concerns about the lack of regional cooperation at the policy level, in conjunction with multilateral initiatives<sup>65</sup>.

## **Conclusion and Policy Recommendations**

This paper addresses the issue of climate security in the South Asian region and explores the climate financing initiatives in progress within each South Asian country, along with their climate change policies. The analysis indicates that climate security is influenced by a multitude of factors, including land, food, health, water, economy, energy, conflict, and emissions. The study presents a unique ranking of all the South Asian countries in terms of climate vulnerability and response. Pakistan ranks as the 3<sup>rd</sup> country in terms of climate security vulnerability. India follows closely at 4<sup>th</sup> place, Afghanistan at 2<sup>nd</sup>, the Maldives at 5<sup>th</sup> place in climate vulnerability, Bhutan at 6<sup>th</sup>, and Sri Lanka at 7<sup>th</sup>.

In terms of climate policies, each country has established its unique policies, legislation, or other legal commitments to address the aftermath of climate-related

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<sup>65</sup> Multilateral Development Banks. Joint Report on Multilateral Development Banks (2011–2021); Multilateral Development Banks: London, UK, 2021



disasters. Notably, Afghanistan is the sole country within the region lacking a specific climate change policy. India, Bangladesh, and Pakistan are actively engaged in preserving their climates, although the overarching South Asian region has yet to fully incorporate climate security into its policy action plans still lacking climate security is one of the major issues that needs to be dealt with.

Furthermore, each country is the beneficiary of financial aid, grants, and funding earmarked for climate restoration efforts. These resources are largely channelled into various projects, encompassing afforestation, food security, energy sustainability, as well as endeavours to combat air and water pollution. Currently, Pakistan has only six live green climate projects, prompting the need for a more comprehensive policy framework to effectively combat climate-related challenges.

- Recognising climate change as a persistent and escalating issue, akin to a chronic health condition, it's vital for Pakistan to adapt its policies and infrastructure to be more resilient to mitigate climate change impacts. This includes preparing for increased temperatures, extreme weather events, and modifications in the agricultural sector.
- Pakistan should focus on setting clear and achievable goals for climate change mitigation. These goals should include saving lives, protecting property, safeguarding agriculture, ensuring food security, and maintaining economic growth. Ensuring sustainable development and poverty eradication should be integral to these goals.
- The current approach to climate policy in Pakistan lacks depth and coherence. There's a need for more intelligent and proactive policy-making that integrates climate considerations into all aspects of governance, moving away from an ad-hoc and fragmented approach.
- Drawing inspiration from global examples like the United States and China, Pakistan could focus on developing its own solutions to climate-related challenges and possibly exporting these solutions. This approach would reduce dependence on external funding and associate with national interests and global solutions.
- Pakistan could explore issuing green bonds to raise capital for environmentally friendly projects. Additionally, establishing a national climate fund could provide a dedicated source of financing for climate initiatives, with contributions from both domestic and international sources.

- Enhance the capacity of government institutions to access international climate finance mechanisms such as the Green Climate Fund, the Global Environment Facility, and the Adaptation Fund. This involves developing proposals that align with the criteria of these funds and building the necessary institutional and technical capacities.
- Promote climate change awareness among diverse groups, including the working class, students, and even schoolchildren, highlighting the potential hazards of climate change disasters. Additionally, engage these communities as partners in climate action initiatives.

### Action Matrix

<b>Problem</b>	<b>Action Steps</b>	<b>Responsible Parties</b>	<b>Timeline</b>	<b>Key Performance Indicators</b>
<b>Climate Security</b>	climate-resilient infrastructure	<b>Government and Ministries (Both provincial and Federal Level)</b>	5 years	Revised laws, practically implement NSP
	fees on vehicles with above-average emission rates		5 years	Implement EV policy, fee implementation on particular vehicles
	Large-scale reforestation and afforestation projects		5 years	Both mandatory and voluntary performance reports should be submitted to relevant authorities twice a year
	Sustainable urban planning and design		5 years	Foster Public-private partnership, Environmental Management Systems should be launched

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