



## Examining environmental security in South Asia: imminent threats and implications (2000-2025)

Ritika

Date of Submission: 05-04-2026

Date of Acceptance: 16-04-2026

### Abstract

Environmental security has emerged as a critical non-traditional security concern in South Asia, a region characterised by high population density, fragile ecosystems, and complex geopolitical relationships. This research article examines the evolving dimensions of environmental security in South Asia by analysing imminent environmental threats and their broader security implications between 2000 and 2025. The study focuses on key challenges such as climate change, water scarcity, extreme weather events, deforestation, sea-level rise, and environmental degradation, and assesses how these issues interact with political stability, economic development, and human security in the region.

The study argues that environmental insecurity in South Asia should be viewed not merely as an ecological concern but as a strategic and security challenge requiring integrated policy responses. Strengthening regional cooperation, improving environmental governance, and incorporating environmental considerations into national security frameworks are essential for mitigating future risks. The findings of this research aim to contribute to the growing discourse on environmental security by emphasising the need for sustainable and cooperative approaches to address emerging non-traditional threats in South Asia.

### Keywords

Environmental Security, South Asia, Climate Change, Non-Traditional Security, Resource Scarcity, Human Security, and Regional Stability.

### I. Introduction

Environmental security has become a key focus in modern security studies, especially in fragile and socio-economically vulnerable regions. Historically, security has been primarily associated with military concerns, such as sovereignty, territory, and conflict. But since the late 20th century, experts and policymakers have recognised that non-traditional threats such as environmental damage, climate change, resource shortages, and natural disasters can be just as threatening to stability and human life. For South Asia, a region marked by dense population, ecological sensitivity, and complex

politics, environmental security has gained particular importance.

South Asia comprises countries such as India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan, the Maldives, and Afghanistan, all of which face varying degrees of environmental stress. The region hosts nearly one-fourth of the global population but possesses limited natural resources relative to its demographic pressure. Between 2000 and 2025, South Asia has witnessed intensified environmental challenges, including rising temperatures, erratic monsoon patterns, frequent floods and droughts, glacial retreat in the Himalayas, sea-level rise in coastal zones, and widespread air and water pollution. These challenges have not only affected ecosystems but have also directly undermined livelihoods, food security, public health, and governance capacity.

Environmental security in South Asia cannot be understood in isolation from human security. A large proportion of the region's population depends directly on climate-sensitive sectors such as agriculture, fisheries, and forestry. Environmental disruptions, therefore, translate rapidly into economic distress, unemployment, displacement, and social vulnerability. For example, repeated flooding in Bangladesh and Pakistan has displaced millions of people, while prolonged droughts and groundwater depletion in India have contributed to agrarian distress and rural-to-urban migration. Such processes strain urban infrastructure, deepen inequality, and create conditions that may lead to social unrest and political instability.

The strategic importance of environmental security in South Asia is further heightened by the region's shared ecological systems. Major rivers such as the Indus, Ganges, and Brahmaputra cross national borders and sustain multiple states. Changes in river flow due to glacial melting, dam construction, and climate variability have increased tensions over water allocation. Although treaties and agreements exist, environmental changes have placed new pressure on these arrangements, raising concerns about future cooperation and conflict. Environmental stress thus acts as a "threat multiplier," intensifying existing



political rivalries rather than creating entirely new conflicts.

Despite the growing severity of these challenges, environmental issues in South Asia have often been treated as development or disaster-management concerns rather than as core security threats. Government responses have largely focused on short-term relief and emergency response instead of long-term adaptation and prevention. Regional institutions such as the South Asian Association for Regional Cooperation (SAARC) have struggled to provide effective platforms for collective environmental action. As a result, the region remains inadequately prepared to address the long-term security implications of environmental change.

This dissertation examines environmental security in South Asia during the period from 2000 to 2025, with a specific focus on imminent threats and their broader implications. The study seeks to move beyond a purely environmental or developmental perspective by situating environmental challenges within the framework of non-traditional security studies. By doing so, it highlights how environmental degradation intersects with political stability, economic resilience, and strategic planning. The chosen timeframe captures a period of intensified climate impacts, policy evolution, and increasing scholarly attention to environmental security.

The central research questions guiding this dissertation are:

1. What are the major environmental security threats facing South Asia between 2000 and 2025?
2. What are their implications for human security, political stability, and regional cooperation?

## **Conceptual Framework and Review of Literature**

### **Conceptualising Environmental Security**

The concept of environmental security developed as part of the broader shift from traditional to non-traditional security paradigms in the post-Cold War period. Conventional security frameworks primarily emphasised military power, territorial integrity, and interstate conflict. However, the changing nature of global threats exposed the limitations of a purely state-centric and militarised understanding of security. Environmental security emerged in response to the recognition that environmental degradation, climate change, and resource scarcity can undermine the foundations of state stability and human survival.

The United Nations Development Programme (UNDP) played a critical role in shaping this discourse by linking environmental security to the broader concept of human security. The 1994

Human Development Report defined human security as freedom from fear and freedom from want, explicitly identifying environmental degradation as a key threat to human well-being. This approach shifted the focus of security away from states alone and toward individuals and communities, particularly in developing regions.

In South Asia, environmental security is deeply interconnected with human security due to the region's reliance on climate-sensitive livelihoods. Agriculture, fisheries, and natural resource-based employment remain central to economic survival for large segments of the population. Environmental disruptions, therefore, have immediate and far-reaching consequences, transforming ecological stress into social, political, and economic insecurity.

### **Environmental Security as a Non-Traditional Security Threat**

Non-traditional security threats differ from conventional threats in their sources, impacts, and modes of response. Environmental security threats do not originate from hostile states or armed groups but from ecological processes intensified by human activity. Climate change, pollution, deforestation, and water scarcity are not deliberate acts of aggression, yet they can destabilise societies and undermine governance structures.

Scholars increasingly describe environmental challenges as “threat multipliers.” This concept suggests that environmental stress does not directly cause conflict but amplifies existing vulnerabilities such as poverty, weak institutions, ethnic divisions, and political marginalisation. In South Asia, where many states already face governance challenges, environmental stress can significantly exacerbate instability.

From 2000 onwards, security institutions across the world began acknowledging environmental risks. Defence establishments, particularly in developing regions, have increasingly been involved in disaster response and humanitarian assistance. This expansion of military roles highlights the security implications of environmental crises, even in the absence of armed conflict.

### **Review of Global Literature on Environmental Security (2000–2025)**

The early 2000s marked a period of expanding academic engagement with environment–security linkages. Thomas Homer-Dixon's work on environmental scarcity and violence was foundational in establishing the idea that resource degradation could contribute to social conflict. He identified three forms of scarcity: supply-induced,



demand-induced, and structural scarcity and argued that their interaction could undermine livelihoods and weaken state institutions. Although critics argued that his approach overstated the inevitability of conflict, his framework influenced subsequent research.

Jon Barnett and Neil Adger advanced the debate by emphasising climate change as a central security issue. Their research highlighted that climate change disproportionately affects vulnerable populations, thereby increasing the risk of insecurity. Rather than framing climate change as a direct cause of war, they emphasised its role in intensifying existing social and political stresses.

Simon Dalby offered a geopolitical interpretation of environmental security, arguing that climate change challenges the fundamental assumptions of the modern political order, including territorial sovereignty and state control over resources. According to Dalby, environmental change requires rethinking security beyond borders and military power, especially in ecologically interconnected regions.

Reports by the Intergovernmental Panel on Climate Change (IPCC) between 2007 and 2023 consistently identified South Asia as one of the most climate-vulnerable regions globally. These assessments highlighted risks related to food security, water availability, extreme weather events, and sea-level rise. While the IPCC does not frame its analysis explicitly in security terms, its findings have been widely used in environmental security scholarship.

International organisations such as the World Bank and UN Environment Programme also contributed to the literature by emphasising climate resilience, disaster risk reduction, and sustainable development. However, much of this literature focuses on policy and development outcomes rather than explicitly engaging with security frameworks.

### **South Asian Perspectives on Environmental Security**

Scholarly work on environmental security in South Asia expanded significantly after 2000, particularly in response to visible climate impacts and recurring natural disasters. South Asian scholars have emphasised that environmental insecurity in the region is shaped as much by political and institutional factors as by ecological conditions.

Adil Najam argued that weak governance, policy fragmentation, and lack of regional cooperation are major obstacles to addressing environmental challenges in South Asia. He emphasised that environmental issues are often politicised or marginalised, preventing coordinated responses. Saleem Ali highlighted the importance of

environmental peacebuilding, suggesting that shared ecological challenges could serve as opportunities for cooperation rather than conflict.

Research on water security has been particularly prominent. Scholars examining the Indus, Ganges, and Brahmaputra river basins have explored how water scarcity, dam construction, and climate variability affect interstate relations. While most studies conclude that outright “water wars” are unlikely, they acknowledge that water stress can increase diplomatic tensions and mistrust.

Studies on climate-induced migration in South Asia have also gained attention. Research on Bangladesh, India, and Nepal demonstrates how environmental displacement affects urbanisation patterns, labour markets, and social cohesion. However, migration is often discussed as a humanitarian or development issue rather than a security concern, reflecting a broader tendency to compartmentalise environmental challenges.

### **Environmental Security and Human Security Linkages**

A key theme in the literature is the close relationship between environmental security and human security. Environmental degradation affects access to clean water, food, shelter, and health, core components of human security. In South Asia, where poverty and inequality remain widespread, environmental shocks can rapidly push vulnerable populations into deeper insecurity.

For example, prolonged droughts reduce agricultural productivity, leading to income loss and food shortages. Floods and cyclones destroy homes and infrastructure, forcing displacement and disrupting education and healthcare. These impacts undermine trust in state institutions, particularly when government responses are inadequate or uneven.

Human security-oriented approaches emphasise prevention, resilience, and community-level adaptation. However, critics argue that an exclusive focus on human security may underplay the strategic and geopolitical dimensions of environmental threats, particularly in regions with shared resources and contested borders.

### **Gaps in Existing Literature**

Despite the growing body of research, several significant gaps remain in the literature on environmental security in South Asia. First, many studies focus on individual countries or specific environmental sectors, limiting comparative regional analysis. This fragmented approach obscures trans boundary dynamics and shared vulnerabilities.



Second, environmental security remains insufficiently integrated into mainstream security and defence studies. Environmental issues are often treated as peripheral concerns, separate from national security planning. This separation limits the development of comprehensive policy frameworks that address both immediate and long-term risks.

Third, there is limited empirical research linking environmental stress directly to security outcomes such as political instability, civil unrest, or strategic shifts. While the concept of environmental stress as a threat multiplier is widely accepted, more region-specific evidence is needed.

Finally, regional institutions such as SAARC have received limited scholarly attention in environmental security research, despite their potential role in fostering cooperation. Understanding institutional constraints and opportunities is essential for developing effective regional responses.

### Conceptual Framework of the Study

This dissertation adopts an integrated environmental security framework that combines elements of human security, non-traditional security, and political ecology. Environmental change is conceptualised as an underlying stressor that interacts with socio-economic vulnerability, governance capacity, and political relations. Rather than viewing environmental factors as direct causes of conflict, the framework emphasises their role in shaping risk environments.

By situating environmental security within the South Asian context, this study bridges the gap between environmental studies and security analysis. The framework guides the examination of environmental threats, case studies, and security implications discussed in subsequent chapters.

## II. Research Methodology

This chapter outlines the methodological approach adopted to examine environmental security in South Asia between 2000 and 2025. Given the interdisciplinary nature of environmental security situated at the intersection of environmental studies, international relations, and security studies, a qualitative research design has been employed. The methodology is designed to facilitate an in-depth understanding of environmental threats and their security implications rather than to establish causal relationships through quantitative measurement.

### Sources of Data

The study relies exclusively on secondary data sources, given the regional scope and timeframe of the research. Data has been collected from a wide

range of credible and authoritative sources published between 2000 and 2025. These include:

Peer-reviewed academic journals on environmental security, climate change, and international relations  
Books and edited volumes by recognised scholars in security studies

Reports from international organisations such as the United Nations Development Programme (UNDP), Intergovernmental Panel on Climate Change (IPCC), World Bank, and United Nations Environment Programme (UNEP)

Government policy documents, national climate action plans, and disaster management reports from South Asian countries

Think-tank publications and policy briefs relevant to South Asian security dynamics.

### Scope and Timeframe of the Study

The research is confined to the period 2000–2025, a timeframe selected for both analytical relevance and data availability. This period captures the acceleration of climate change impacts, the expansion of environmental security literature, and the growing recognition of non-traditional security threats in South Asia.

Geographically, the study focuses on South Asia, with particular attention to India, Pakistan, Bangladesh, and Nepal. These countries were selected due to their high environmental vulnerability, demographic significance, and relevance to regional security dynamics. While references are made to other South Asian states where necessary, the analysis prioritises depth over breadth.

### Imminent Threats to Environmental Security

- **Climate Change & Extreme Weather:** The region is highly vulnerable to rising temperatures, irregular monsoons, and extreme weather events, such as cyclones and intense flooding, impacting agricultural productivity.
- **Water Scarcity & Pollution:** Severe water scarcity, particularly in Pakistan, and the pollution of major rivers (e.g., the Ganges) with untreated waste create a crisis for drinking water and agriculture.
- **Glacial Melt & Sea-Level Rise:** Rapid glacier melting in Bhutan, Nepal, and India threatens long-term water availability. Concurrently, sea-level rise threatens coastal areas, particularly in Bangladesh and the Maldives, with saline intrusion.
- **Rapid Urbanisation & Resource Strain:** Urban centres are struggling with high influxes of people and environmental



degradation, creating "climate refugees" and increasing social vulnerability.

### **Environmental Security Landscape in South Asia (2000–2025)**

Between 2000 and 2025, South Asia has experienced profound environmental transformations that have significantly altered the region's security landscape. Environmental challenges in this period have not only intensified in frequency and scale but have also become increasingly interconnected with social, economic, and political vulnerabilities. Climate change, water stress, food insecurity, pollution, and natural disasters together constitute a complex web of environmental security threats that directly affect human survival and state stability. This chapter examines the major environmental stressors in South Asia and evaluates their implications through a security-oriented lens.

### **Climate Chaos in Asia**

#### **The World**

**Meteorological Organisation (WMO)** State of the Climate in Asia 2024 (2025) report makes clear that Asia is now experiencing climate change at an accelerated rate, with impacts ranging from deadly heatwaves to catastrophic flooding (WMO, 2025).

Asia is warming **nearly twice as fast as the global average**, with 2024 recorded as one of the hottest years on record for the region (WMO, 2025). Temperature anomalies reached **+1.04 °C above the 1991–2020 average**, a dangerous threshold for a region that holds more than half of the world's population. A companion scientific review, the NAM S&T Centre and South Asian Meteorological Association's Fact File on Heatwaves (2025), emphasises that extreme heat events are becoming longer, more frequent, and more intense, with devastating impacts on health, agriculture, water, and energy systems in the developing world (NAM S&T Centre & SAMA, 2025).

### **Climate Change and Extreme Weather Events**

Climate change represents the most overarching environmental security threat in South Asia. Rising average temperatures across the region have altered monsoon patterns, increased the intensity of heatwaves, and contributed to the growing frequency of extreme weather events. Since the early 2000s, South Asia has witnessed more frequent and severe floods, cyclones, droughts, and heat stress episodes than in previous decades.

Heatwaves in India and Pakistan have resulted in thousands of heat-related deaths and significantly reduced labour productivity, particularly in outdoor sectors such as agriculture and

construction. Flooding has become a recurring phenomenon in Bangladesh, Nepal, and parts of India, resulting in large-scale displacement and significant infrastructure damage. Cyclones affecting the Bay of Bengal and the Arabian Sea have increased in intensity, threatening coastal populations and economic assets.

From a security perspective, these climate-induced disasters place immense pressure on state institutions. Governments are compelled to divert resources from long-term development and defence planning toward emergency relief and reconstruction. Repeated climate shocks weaken fiscal capacity, increase dependency on external assistance, and expose governance failures. Over time, this erosion of state capacity can undermine political legitimacy and public trust.

### **Water Security and Trans boundary Resource Stress**

Water security is one of the most politically sensitive and strategically significant environmental issues in South Asia. The region relies heavily on river systems originating in the Himalayan glaciers, which supply water for agriculture, industry, and domestic consumption. Climate change has accelerated glacial retreat, altered river flow patterns, and increased uncertainty regarding future water availability.

Transboundary rivers, such as the Indus, Ganges, and Brahmaputra, are shared by multiple states, making water management inherently geopolitical. The Indus Waters Treaty between India and Pakistan has historically been cited as an example of successful water cooperation. However, changing hydrological conditions, population growth, and infrastructure development have placed new strains on the treaty framework. Similar challenges exist in India–Bangladesh relations over the Teesta River.

While most people largely agree that large-scale "water wars" remain unlikely, water stress has intensified diplomatic tensions and mistrust. Water scarcity also affects internal security by contributing to agricultural distress, rural unemployment, and migration. In security terms, water scarcity functions as a destabilising factor that amplifies existing political and social vulnerabilities.

#### **Impact on Water Security**

- **Agriculture and Food Security:** Over 50% of the population relies on water for livelihoods, with food security directly threatened by water scarcity and disruption in flows.



- **Environmental Degradation:** Approximately 80% of wastewater is discharged untreated, polluting major rivers and worsening the water crisis.
- **Weak Governance:** Current decision-making is heavily dominated by

bureaucratic and political agendas rather than transparent, community-focused, or integrated basin-wide, sustainable management, despite initiatives like the Bangladesh Delta Plan 2100.

**Table 2: Major Transboundary Rivers and Associated Security Concerns**

River System	Countries Involved	Key Security Concerns
Indus	India, Pakistan	Treaty Stress, Climate variability
Ganges	India, Bangladesh	Water allocation, seasonal scarcity
Brahmaputra	China, India, Bangladesh	Upstream control, flood risks

### Food Security and Agricultural Vulnerability

Food security in South Asia is highly vulnerable due to climate change, with food vulnerability rising from roughly 13.3% to 18.7% between 2016 and 2019, further exacerbated by COVID-19. The region, hosting one-fourth of the world's population, faces intense pressure from climate-related shocks like floods and droughts, low crop yields, and high dependency on rainfed agriculture, threatening food availability and stability. Agriculture employs a substantial proportion of the population and remains highly dependent on monsoon rainfall. Climate variability has disrupted agricultural cycles, reduced crop yields, and increased the frequency of crop failures.

The World Food Program's (WFP) Hunger Hotspots warns of deteriorating food security in 16 countries over the coming year, with Afghanistan, Somalia, and Syria re-entering the list. The WFP 2026 Global Outlook reports a 20 percent increase in the number of people facing acute food insecurity since 2020

Droughts in India and Pakistan and floods in Bangladesh and Nepal have directly affected food production. Small and marginal farmers are particularly vulnerable, as they lack financial buffers and access to adaptive technologies. Agricultural distress has contributed to rising indebtedness, farmer protests, and migration to urban centres.

### Environmental Degradation, Pollution, and Public Health

Rapid industrialisation, urbanisation, and population growth have led to severe environmental degradation in South Asia. Air pollution in major cities such as Delhi, Lahore, and Dhaka has reached hazardous levels, posing serious public health risks. Water pollution in rivers and groundwater sources has reduced access to safe drinking water and increased disease burdens.

- **Stubble Burning:** Post-harvest burning of crop residues in Punjab and Haryana (India) and Pakistan continues to be a major source of winter smog.
- **Industrial and Urban Pollution:** Rapid urbanisation and industrial growth, including underregulated coal-fired power plants and brick kilns, are primary drivers.
- **Mortality and Disease:** Air pollution is the leading risk factor for poor health in South Asia, resulting in approximately 2.6 million deaths in 2021. The State of Global Air 2025 report indicates that 2 million lives were lost in India alone to air pollution-related diseases in 2023, with 89% of these deaths linked to non-communicable diseases (NCDs) like heart disease, lung cancer, diabetes, and a new, emerging link to dementia.
- **The 2024–2025 Crisis:** In November 2024, an extreme "India-Pakistan Smog" event saw Lahore and Delhi compete as the world's most polluted cities, with AQI levels breaching "Severe" categories. In 2025, Delhi recorded zero "Good" air quality days, creating a permanent health crisis.
- **Vulnerable Populations:** Approximately 76% of children in South Asia are exposed to dangerous levels of air pollution and soaring temperatures.

### Natural Disasters and Disaster Management Capacity

South Asia is among the most disaster-prone regions in the world. Earthquakes, floods, landslides, cyclones, and droughts have caused extensive loss of life and property between 2000 and 2025.

- **Persistent & Intense Cyclones:** South Asia faces severe cyclones in the Bay of Bengal and the Arabian Sea. The 2004 Tsunami, 2008 Kosi flood, and recent events like



Cyclone Ditwah (Nov/Dec 2025)—which hit Sri Lanka and India with damage equivalent to 4% of Sri Lanka's GDP—highlight high vulnerability.

- **Erratic Monsoon & Floods:** Monsoons have become increasingly unpredictable, causing catastrophic flash floods in India, Pakistan, Nepal, and Bangladesh (e.g., 2022 Pakistan floods, 2024 North India/Nepal floods).
- **Himalayan Disasters:** Rapid glacial melting is increasing glacial lake outburst floods (GLOFs), landslides, and flash floods in the Himalayan region.

#### **Institutional Frameworks:**

- **India:** Established the National Disaster Management Authority (NDMA) under the DM Act 2005, creating a multi-layered, multi-hazard, and multi-sectoral approach.
- **Bangladesh:** Strong community-based approaches to cyclone preparedness have significantly reduced mortality rates over the past two decades.
- **Nepal:** passed the Disaster Risk Reduction and Management Act (2017) to decentralise response, although implementation faces bureaucratic challenges.
- **Early Warning Systems (EWS):** Significant strides have been made in meteorological forecasting (e.g., by the Indian Meteorological Department - IMD), especially for cyclones. However, EWS for heatwaves, flash floods, and landslides remain uneven, with only about 33% of at-risk individuals in India covered by flood EWS.
- **Regional Cooperation (SAARC & Others):** The SAARC Comprehensive Regional Framework for Action (2006-2015) was designed to foster collaboration. While regional cooperation exists, practical execution in transboundary disasters is often hampered by political instability and resource gaps.
- **Coalition for Disaster Resilient Infrastructure (CDRI):** Led by India, this initiative aims to strengthen infrastructure resilience, focusing on technical and financial capacity building.

#### **Environmental Stress as a Threat Multiplier**

One of the most significant insights from environmental security research is the role of environmental stress as a threat multiplier.

Environmental challenges rarely cause conflict directly; instead, they intensify existing political, economic, and social vulnerabilities. In South Asia, where poverty, inequality, and governance challenges persist, environmental stress exacerbates insecurity.

Climate-induced migration, competition over resources, and pressure on urban infrastructure can increase social tensions and challenge governance capacity. Environmental insecurity thus becomes intertwined with broader security concerns, including internal stability and regional relations.

#### **Case Studies of Environmental Security in South Asia**

To understand how environmental insecurity manifests in practice, it is essential to examine country-specific experiences. South Asia is not environmentally homogeneous; vulnerabilities differ based on geography, governance capacity, and socio-economic conditions. This chapter presents four case studies, Bangladesh, India, Pakistan, and Nepal, to illustrate how environmental threats translate into human, political, and security challenges. These cases highlight the diverse yet interconnected nature of environmental security in the region.

#### **Bangladesh: Climate Change, Displacement, and Human Security**

Bangladesh is widely recognised as one of the most climate-vulnerable countries in the world. Its low-lying geography, dense population, and dependence on climate-sensitive livelihoods make it particularly exposed to environmental stress. Between 2000 and 2025, Bangladesh has experienced recurrent floods, cyclones, river erosion, and rising sea levels, all of which have profound implications for human security.

Frequent flooding of major river systems such as the Ganges-Brahmaputra-Meghna delta has displaced millions of people. Cyclones such as Sidr (2007) and Amphan (2020) caused widespread destruction of homes, agricultural land, and infrastructure. Sea-level rise has increased soil salinity in coastal areas, reducing agricultural productivity and access to fresh drinking water.

From a security perspective, environmental displacement represents a major challenge. Internally displaced populations often migrate to urban centres like Dhaka, placing pressure on housing, sanitation, employment, and social services. While Bangladesh has made notable progress in disaster preparedness and early warning systems, long-term adaptation remains difficult due to resource constraints. Environmental insecurity in Bangladesh primarily



manifests as a human security crisis rather than an interstate threat, yet its scale poses significant governance challenges.

### India: Water Stress, Environmental Degradation, and Internal Stability

India's environmental security challenges are closely linked to its size, population, and rapid economic growth. Between 2000 and 2025, India has faced severe water stress, environmental degradation, and increasing climate variability. Groundwater depletion, river pollution, deforestation, and air pollution have emerged as major threats to sustainability and internal stability.

Water scarcity is particularly acute. Several regions depend heavily on groundwater, which has been extracted faster than it can be replenished. Rivers such as the Yamuna and Ganga have experienced severe pollution, affecting public health and livelihoods. Climate change has further disrupted monsoon patterns, increasing uncertainty for agriculture.

These environmental pressures have contributed to agrarian distress, farmer protests, and rural migration. In security terms, internal instability linked to environmental stress poses a serious challenge for governance. Interstate water disputes within India, such as those involving the Cauvery and Krishna rivers, demonstrate how environmental scarcity can generate political conflict even within a single state.

India's experience highlights the need to integrate environmental management with social and economic policy. Environmental insecurity does not threaten India's territorial integrity directly, but it undermines social cohesion and long-term national resilience.

### Pakistan: Climate Shocks, Governance, and National Security

Pakistan is highly vulnerable to climate change due to its dependence on the Indus River system and its exposure to extreme weather events. Between 2000 and 2025, Pakistan experienced severe floods, heatwaves, and droughts, most notably the catastrophic floods of 2010 and 2022.

These disasters caused extensive loss of life, damaged infrastructure, and displaced millions of people. They also exposed weaknesses in

governance, planning, and institutional coordination. The scale of destruction required significant involvement of the military in disaster response, highlighting the security dimension of environmental crises.

Water security remains a critical concern for Pakistan. Dependence on upstream river flows and fears regarding water availability have shaped perceptions of national security. While the Indus Waters Treaty has endured, climate variability and increasing demand have heightened anxieties.

In Pakistan's case, environmental insecurity directly intersects with national security by straining state capacity, increasing reliance on the military, and amplifying existing socio-political vulnerabilities. Environmental stress does not operate in isolation, but compounds challenges related to economic fragility and political instability.

### Nepal: Himalayan Fragility and Disaster Risk

Nepal's environmental security challenges are shaped by its mountainous geography and fragile ecosystems. Between 2000 and 2025, climate change has accelerated glacial melting in the Himalayas, increasing the risk of glacial lake outburst floods (GLOFs), landslides, and floods.

These environmental threats endanger rural livelihoods, hydropower infrastructure, and downstream communities. Nepal's limited economic resources and infrastructure capacity constrain its ability to implement large-scale adaptation measures. Environmental disasters often disrupt development gains and exacerbate poverty.

From a security perspective, Nepal's environmental vulnerability primarily affects human security and development stability. However, its position within shared river basins means that environmental changes also have regional implications, particularly for downstream countries such as India. Nepal's case underscores how environmental security challenges can transcend national borders even when they originate in relatively small states.

### Comparative Insights from the Case Studies

The four case studies reveal both common patterns and distinct experiences. All countries face increasing environmental stress linked to climate change, yet the nature of insecurity varies

Table 3: Comparative Overview of Case Studies

Country	Key Environmental threat	Primary Security Impact
Bangladesh	Floods, sea-level rise	Displacement, Human security
India	Water stress, pollution	Internal stability



Pakistan	Floods, Water scarcity	Governance, National security
Nepal	Glacial melting	Disaster risk, regional impact

### Security Implications and Research Gaps

Environmental insecurity in South Asia has far-reaching implications that extend beyond ecological damage and humanitarian concerns. Between 2000 and 2025, environmental challenges in the region have increasingly shaped human security, political stability, governance capacity, and regional relations. This chapter analyses the key security implications of environmental stress and identifies major research gaps that limit effective understanding and policy responses.

### Miyawaki Forest and Permaculture for Climate Resilience

Innovative green solutions like Miyawaki forests and permaculture are becoming game-changers for cities struggling with climate change. Miyawaki forests are essentially "pocket forests"—dense, native woodlands that grow ten times faster than traditional plantations. Because they are so thick, they act like natural air conditioners for hot cities, sucking up pollution and bringing back local wildlife in record time. They are perfect for urban areas where space is tight, but the need for nature is high.

On the food and water front, permaculture takes a page out of nature's playbook. Instead of typical farming, it designs landscapes that mimic natural ecosystems, mixing crops, trees, and animals into a self-sustaining loop. This method is incredibly resilient; it restores tired soil, saves water, and helps farms survive both heavy floods and long droughts. Together, these two approaches don't just help the planet heal—they create a "safety net" for communities, making them much tougher in the face of a changing climate.

### Implications for Human Security

The most immediate impact of environmental insecurity in South Asia is on human security. Environmental degradation, climate variability, and natural disasters directly threaten access to food, water, shelter, and health, core components of human security. In agrarian economies, climate-induced crop failures and water scarcity reduce incomes and increase vulnerability, particularly among rural and marginalised communities.

Environmental disasters such as floods and cyclones displace large populations, disrupt education and healthcare, and increase exposure to

disease. These impacts are not evenly distributed; women, children, and the poor are disproportionately affected. Persistent human insecurity undermines social cohesion and increases dependence on state and non-state support mechanisms, placing long-term strain on governance systems.

### Political Stability and Governance Challenges

Environmental stress poses significant challenges to political stability in South Asia. Recurrent environmental crises test the capacity of governments to respond effectively and equitably. Inadequate disaster response or uneven distribution of relief can erode public trust in state institutions and fuel political dissatisfaction.

Environmental insecurity also interacts with existing governance weaknesses such as corruption, bureaucratic inefficiency, and limited state presence in rural areas. In some cases, environmental stress contributes to social unrest, protests, and political mobilisation, as seen in farmer movements linked to water scarcity and agricultural distress. Over time, such pressures can weaken political legitimacy and exacerbate instability.

### Economic and Developmental Implications

Environmental degradation undermines economic security by damaging infrastructure, reducing productivity, and increasing public expenditure on disaster relief and healthcare. Recurrent climate shocks divert resources away from long-term development and defence planning, limiting states' ability to invest in resilience and security.

In South Asia, where economic growth is essential for poverty reduction and political stability, environmental insecurity threatens development gains. Economic vulnerability, in turn, reinforces security risks by increasing inequality and limiting adaptive capacity.

### Strategic and Military Implications

Environmental insecurity has altered the strategic and military landscape in South Asia. Armed forces across the region are increasingly deployed for disaster relief, humanitarian assistance, and infrastructure protection. While such roles highlight the security relevance of environmental crises, they also raise questions about the long-term implications for civil-military relations.



The expansion of military involvement in non-traditional security tasks may strain defence resources and divert attention from conventional security priorities. At the same time, environmental stress affecting shared resources such as rivers has the potential to influence strategic calculations and diplomatic relations, particularly in already tense bilateral relationships.

### **Regional and Trans boundary Security Implications**

Environmental challenges in South Asia are inherently trans boundary. Shared river systems, migratory populations, and cross-border ecological impacts mean that environmental insecurity in one state often affects its neighbours. However, regional cooperation remains limited, and existing institutions lack effective mechanisms for addressing environmental security collectively.

The absence of robust regional frameworks increases the risk that environmental stress will exacerbate geopolitical tensions rather than encourage cooperation. This represents a missed opportunity, as shared environmental vulnerabilities could serve as a foundation for confidence-building and collaborative security initiatives.

### **Research Gaps in Environmental Security Studies**

Despite growing scholarly attention, several research gaps remain in the study of environmental security in South Asia. First, there is a lack of interdisciplinary research that integrates environmental science with security and strategic studies. Environmental issues are often analysed separately from national security frameworks, limiting holistic understanding.

Second, empirical evidence linking environmental stress to specific security outcomes remains limited. While the concept of environmental stress as a threat multiplier is widely accepted, more region-specific case studies and data-driven analyses are needed.

Third, comparative regional studies are insufficient. Much of the literature focuses on individual countries, neglecting trans boundary dynamics and regional institutions. Finally, there is limited research on the role of regional organisations such as SAARC in managing environmental security, despite their potential relevance.

### **Policy Gaps and Strategic Limitations**

Policy responses to environmental insecurity in South Asia remain largely reactive. Governments prioritise disaster response over prevention and long-term adaptation. Environmental considerations are

often absent from national security strategies and defence planning.

Bridging these gaps requires integrating environmental security into strategic thinking, strengthening institutional coordination, and promoting regional cooperation. Without such reforms, environmental insecurity will continue to undermine stability and resilience in South Asia.

### **III. Conclusion and Recommendations**

Environmental security has emerged as a critical non-traditional security concern in South Asia during the period from 2000 to 2025. This dissertation examined the nature of environmental insecurity in the region, identified its major drivers, and analysed its implications for human security, governance, and regional stability. Through a review of existing literature and detailed case studies, the study demonstrated that environmental challenges in South Asia are not merely ecological issues but are deeply interconnected with political, economic, and security dynamics.

The case studies of Bangladesh, India, Pakistan, and Nepal illustrated how environmental insecurity manifests differently across national contexts. Bangladesh faces severe human security challenges driven by climate-induced displacement and coastal vulnerability. India's environmental insecurity is closely linked to resource mismanagement and internal socio-economic pressures. Pakistan's experience demonstrates how climate shocks strain governance capacity and intersect with national security concerns, while Nepal's case highlights the security implications of ecological fragility in the Himalayan region. Together, these cases underscore the diversity of environmental threats and their shared regional significance.

From a security perspective, the dissertation concludes that environmental insecurity in South Asia has expanded the scope of security beyond traditional military threats. Human security, disaster management, economic resilience, and environmental governance have become essential components of national and regional security frameworks. The increasing involvement of armed forces in disaster response further reflects the securitisation of environmental challenges, while also raising questions about long-term strategic priorities.

### **References**

- [1]. Dalby, S. (2002). *Environmental security* (Vol. 20). U of Minnesota Press.



- [2]. United Nations Development Programme. (1994). Human development report 1994: New dimensions of human security. UNDP.
- [3]. United Nations Environment Programme. (2016). Environment, natural resources and conflict. UNEP.
- [4]. United Nations Office for Disaster Risk Reduction. (2022). Global assessment report on disaster risk reduction. UNDRR.
- [5]. World Bank. (2013). Turn down the heat: Climate extremes, regional impacts, and the case for resilience. World Bank.
- [6]. World Bank. (2018). South Asia's hotspots: The impact of temperature and precipitation changes on living standards. World Bank.
- [7]. World Bank. (2021). Climate change action plan 2021–2025. World Bank.
- [8]. Sinha, U. K. (2006). Environmental Stresses and Their Security Implications for South Asia. *Strategic Analysis*, 30(3), 599–618. <https://doi.org/10.1080/17540054.2006.12288851>
- [9]. Organisation for Economic Co-operation and Development. (2018). Climate change and security risks. OECD Publishing.
- [10]. Salehin, M., & Hossain, K. (2019). Climate change and displacement in Bangladesh. *Environmental Science & Policy*, 98, 86–95.
- [11]. Adger, W., Barnett, J., Brown, K. et al. Cultural dimensions of climate change impacts and adaptation. *Nature Clim Change* 3, 112–117 (2013).
- [12]. Asian Development Bank. (2017). A region at risk: The human dimensions of climate change in Asia and the Pacific. Asian Development Bank.
- [13]. Brauch, H. G. (2005). Environment and human security: Towards freedom from hazard impacts. UNESCO–EOLSS.
- [14]. Buzan, B., Wæver, O., & de Wilde, J. (1998). Security: A new framework for analysis. Lynne Rienner Publishers.
- [15]. Food and Agriculture Organisation. (2018). Water scarcity in South Asia. FAO.
- [16]. Homer-Dixon, T. F. (2010). Environment, scarcity, and violence. Princeton University Press.
- [17]. Intergovernmental Panel on Climate Change. (2007). Climate change 2007: Impacts, adaptation and vulnerability. Cambridge University Press.
- [18]. Intergovernmental Panel on Climate Change. (2014). Climate change 2014: Impacts, adaptation, and vulnerability. Cambridge University Press.
- [19]. Intergovernmental Panel on Climate Change. (2022). Climate change 2022: Impacts, adaptation and vulnerability. Cambridge University Press.
- [20]. International Organisation for Migration. (2019). Environmental migration in South Asia. IOM. <https://blog.globalclimateassociation.org/state-of-the-climate-in-asia-in-2025-rising-risks-and-nature-based-solutions>
- [21]. Hyön, I. T., & Schreurs, M. A. (Eds.). (2007). *The environmental dimension of Asian security: conflict and cooperation over energy, resources, and pollution*. US Institute of Peace Press.