

**CLIMATE CHANGE AS A NON-TRADITIONAL SECURITY  
THREAT: CASE STUDY OF ENVIRONMENTAL SECURITY  
IN PAKISTAN**



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## **DEDICATION**

This research is dedicated to all the strugglers who fight for the betterment of their self, their family, country and the most important humanity.

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## **ABSTRACT**

Climate change is increasingly recognized as a non-traditional security threat, posing significant challenges to Pakistan's water, food and energy Security, as well as its economic, environmental and human security. This thesis examines the impact of climate change on Pakistan's environmental security and explores the country's efforts to address these challenges. Qualitative research method is used for this research and thematic analysis is used for data collection and analysis. Climate change has intensified weather events such as droughts, floods and extreme temperatures which have directly impacted agriculture, water resources, and biodiversity to cause economic damages consequently leading to mass migration. National Command and Operation Center (NCOC), the Nationally Determined Contribution (NDC), the Climate Change Task Force, and the National Climate Change Policy (NCCP) are some of the nation's efforts and policies to combat climate change. Despite not making much progress on most of the fronts, Pakistan has done well in some specific sectors such as disaster risk reduction strategies and climate-compatible development. However, it faces challenges to achieve its targets for SDG 13 (climate action) including administrative problems within government systems and a large annual financing gap. Many climate resilience projects have been launched in the country, including Ten Billion Tree Tsunami, Clean Green Pakistan Movement and Ecosystem Restoration Initiative to combat climate change and mitigate its effects on ecosystems as well as society. Pakistan is partnering with international partners, such as the United Nations, to combat climate change and its effects on approach. The country aims at empowering its youth, promoting nature-based solutions for mitigation of climatic problems while using market based instruments. Pakistan faces significant challenges due to climate change, which threatens its environmental security and the well-being of its citizens. In order to overcome these challenges, the country should also continue implementing strategies and programs that support climate resilience, adaptation to climate change and international coordination in terms of sharing good practices as well as resources.

## CHAPTER 1: INTRODUCTION

Climate change is a global phenomenon which is attributed by rising temperatures, altering precipitation patterns and an increase in extreme weather events. It is increasingly being recognized as a non-traditional security threat for all the countries around the world with many implications. Climate change does not recognize the borders. It has become a multifaceted challenge for human security, Geopolitics and International Relations. Environmental security is closely linked with climate change. It is responsible for the issues like natural calamities, resource scarcity and sustainable development. Pakistan is highly climate vulnerable country and faces serious environmental security problems because of climate changes. There is a dire need to learn about climate change as non-traditional security threat for the country. The importance of taking urgent measures to combat climate change and its effects is highlighted by the Sustainable Development Goal 13 (SDG 13). This study examines the complex and interdependent relation between climate change and environmental security in the context of Pakistan and measures taken by the country for combatting the threat.

### 1.1. Background

Climate change is a global phenomenon which is attributed by rising temperatures, altering precipitation patterns and an increase in extreme weather events. It refers to shifts in temperature and weather patterns over the long period of time. The reasons for these shifts are also natural but for the last few decades these shifts are mainly due to the human activities. The major reason responsible for the climate change is burning of fossil fuels like coal, oil and gas<sup>1</sup>. The Intergovernmental Panel on climate change (IPCC) has made clear again that there are many consequences of climate change. This can lead to bad effects like higher sea levels, more unpredictable weather changes and severe weather events. These effects have many social and economic consequences for the poor and lower middle income countries, especially those in South Asia<sup>2,3</sup>. Pakistan is not an exception.

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<sup>1</sup> Hans-O Pörtner et al., *Climate Change 2022: Impacts, Adaptation and Vulnerability* (IPCC Geneva, Switzerland:, 2022).

<sup>2</sup> Jonathan Woetzel, Dickon Pinner, and Hamid Samandari, "Climate Risk and Response: Physical Hazards and Socioeconomic Impacts," 2020.

<sup>3</sup> F Bosco et al., "The Global Risks Report 2020| World Economic Forum," *The Global Risks Report*, 2020.

Pakistan hardly contributes 1% of the total world's emissions of carbon. According to the year averages from 2000 to 2019 by Global Climate Risk Index, it is the 8<sup>th</sup> most affected country by the climate change among the top ten countries <sup>4</sup>. The vulnerability of Pakistan is apparent by the floods and droughts in the country. During the floods in 2022 Pakistan incurred an economic loss of \$33 billion and 33 million people were affected <sup>5</sup>. Pakistan has a diversified topography. This includes desert plains, hilly terrains and a long coast line along the Arabian Sea. A large number of climate related problems are presented by this diversified topography. Livelihoods of millions of people in Pakistan is endangered due to the increasing frequency and severity of floods and droughts. One of the problems due to the increasing floods and droughts is the pressure put on the country's already weak water management infrastructure <sup>6</sup>. This is also impacting the local water sources and management. Furthermore, the Himalayan region is experiencing fast glacier melt due to the rising temperature. This may result in trans boundary disputes <sup>7</sup>.

Before the cold war era the security was mostly associated with defending state against military threats from other states. The notion of security has evolved to include many unconventional security elements with the passage of time. In International Relations climate change has seen a rise in recognition as a non-traditional security threat <sup>8</sup>. In recent years, scholars and decision and policy makers have started viewing climate change as a non-traditional security threat. This change in perspective acknowledges that security includes threats that are not just from the military. They also come from the environment, economy and society <sup>9</sup>. Few problems have become as important as climate change in a critical time of worldwide issues. The problem of climate change fueled by the human activities is no more a minor issue. It has moved beyond its traditional designation as a minor environmental problem. It has become a major non-traditional security threat on the global scale <sup>10</sup>. In the twenty-first

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<sup>4</sup> David Eckstein, Vera Künzel, and Laura Schäfer, *The Global Climate Risk Index 2021* (Bonn: Germanwatch, 2021).

<sup>5</sup> DOST BARRECH et al., "PAKISTAN'S NATIONAL SECURITY POLICY: OPPORTUNITIES AND CHALLENGES," *Russian Law Journal* 11, no. 3 (2023).

<sup>6</sup> Pedro Conceição, "Human Development Report 2020-The Next Frontier: Human Development and the Anthropocene," *United Nations Development Programme: Human Development Report*, 2020.

<sup>7</sup> Mayank Shekhar et al., "Himalayan Glaciers Experienced Significant Mass Loss during Later Phases of Little Ice Age," *Scientific Reports* 7, no. 1 (2017): 10305.

<sup>8</sup> Anjan Kumar Sahu, "The Securitisation Of The Climate Change Issue," *World Affairs: The Journal of International Issues* 21, no. 4 (2017): 26–37.

<sup>9</sup> Jon Barnett, "Security and Climate Change," *Global Environmental Change* 13, no. 1 (2003): 7–17.

<sup>10</sup> Rajendra K Pachauri et al., *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Ippc, 2014).

century climate change is not just about melting ice caps and increasing temperatures. It offers a complex web of issues which includes social, ecological, economic and political aspects. Resultantly the idea of environmental security has gained much attention. This places emphasis on how environmental change effects can make the existing vulnerabilities worse by boosting them. How it can increase resource shortages and spark conflicts <sup>11</sup>.

Pakistan is a captivating case study in the growing debate about climate change and how it affects our world and security. Pakistan is located at the crossroads of geopolitical challenges and environmental fragility. The country is going through a lot of problems due to the disruptions brought on by the climate change. Pakistan heavily relies on agriculture sector for food and livelihoods of its people. This sector is very sensitive to temperature changes and precipitation alterations. Pakistan is also densely populated which is particularly vulnerable to extreme weather events. Due to these reasons Pakistan is more exposed to climate change than other countries <sup>12</sup>.

Pakistan immediately needs to lessen risks, improve resilience and promote sustainable development in the face of changing climate. The intricate relationship between environmental security and climate change is something that Pakistani policymakers and decision-makers must comprehend. An in-depth analysis of these complex dynamics is undertaken in this thesis. This explores the complications of Pakistan's environmental security issues in an era of uncertainty about the climate. This study's primary goal is to provide a comprehensive examination of the relationship between Pakistan's environmental security and climate change. It looks at how climate change is manifesting itself as a non-traditional security threat. It also evaluates the success and development of the policies in place to combat its effects on Pakistan's environmental security.

## **1.2. Research Gap**

There are several studies on environmental concerns especially climate change. Climate change is an upsetting issue of the contemporary world. A lot of research is being conducted

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<sup>11</sup> Thomas F Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (1994): 5–40.

<sup>12</sup> Conceição, "Human Development Report 2020-The Next Frontier: Human Development and the Anthropocene."

on the climate change, its vulnerabilities and adaptation at global level. Despite this, climate change and environment in Pakistan's security discourse is understudied. The implications of climate change as a non-traditional security threat on the environmental security of Pakistan are often overlooked. This is mainly due to the policy formulation and implementation gap. This is also due to the lack of enough integration of the environmental issues in the political discourse of the country. This study is aimed to fill this gap by analyzing the intricate relationship between climate change and Pakistan's environmental security. It examines the categorization of climate change as non-traditional security threat primarily in the context of Pakistan. It evaluates the progress of Pakistan towards achieving the targets of SDG 13 (Climate Action) and assesses the existing policies towards mitigating the climate induced environmental security challenges.

### **1.3. Problem Statement**

Climate change is posing serious threats that are real and scientifically proven. The Global climate is changing a lot, characterized by temperatures rise by 1.2°C since the pre-industrial levels, shifting precipitation patterns and extreme weather events happening 40% more often since the 1980s. The implications of climate change are acutely felt around the world. Even though Pakistan emits less than 1% of the global carbon emissions, it is one of the top ten most affected countries from climate change. Climate change poses a complex and evolving non-traditional security threat to Pakistan's environmental security. The implications of climate change go beyond traditional territorial concerns. It encompasses the new issues like population displacement, sustainability of livelihoods, food and water security. According to the Global Climate Risk Index in 2020, about 5% of Pakistan's people face hazards from climate-related disasters every year. During the floods in 2022 Pakistan incurred an economic loss of \$33 billion and 33 million people were affected. Pakistan's economy depends a lot on agriculture. It is more susceptible to environmental problems brought on by climate change. The Pakistan Economic Survey in 2020-21 says that by 2050, agricultural productivity could be 30% less productive because of climate change. This, in turn, exacerbates food insecurity, with over 60% of the population already facing moderate to severe food insecurity, according to the World Food Programme. The Himalayan region is experiencing fast glacier melt due to the rising temperature. Pakistan doesn't get much rain, with just 240 mm on average each year, making it one of the driest countries. People turn to the unsustainable usage and overexploitation of

aquifers to meet their increased water needs, which presents major water security concerns with cascading implications for Pakistan. The intricacy and interconnectedness of these problems make the conventional paradigms of security discourse inadequate for addressing them. This necessitates a detailed analysis of Pakistan-specific environmental security concerns as well as climate change as a non-traditional security threat. This study aims to explore the intricate relationship between climate change and Pakistan's environmental security. It examines the categorization of climate change as non-traditional security threat primarily in the context of Pakistan. It evaluates the progress of Pakistan towards achieving the targets of SDG 13 (Climate Action) and assesses the existing policies towards mitigating the climate induced environmental security challenges.

#### **1.4. Research Questions**

1. Why is climate change considered a non-traditional security threat, particularly in terms of Pakistan?
2. What is the status of Pakistan's contributions towards SDG 13 (Climate Action)?
3. How do existing policies and strategies mitigate climate-induced environmental security challenges in Pakistan?

#### **1.5. Research Objectives**

The primary objective of this research is to explore the intricate relationship between climate change and environmental security in Pakistan. The study seeks to provide a comprehensive analysis that aligns with the following objectives:

1. To investigate the categorization of climate change as a non-traditional security threat in Pakistan.
2. To evaluate Pakistan's progress and actions toward meeting the targets of SDG 13 (Climate Action).
3. To assess existing policies and strategies in Pakistan aimed at mitigating climate induced environmental security challenges.



## 1.6. Significance of the Study

This study sheds light on the complex relationship between climate change and environmental security in Pakistan, which is particularly relevant to the field of International Relations and climate change studies. Given Pakistan's diverse topography, shifting socioeconomic conditions, and complex regional dynamics, the country is particularly vulnerable to the effects of climate change, and it faces a number of conventional and unconventional security challenges. The study will also clarify the rationale behind categorizing climate change as a security issue during an era of increasing environmental concerns, which will ultimately prioritize climate-related issues within security agendas. The importance of this study is highlighted as under:

1. **Addressing Global Climate Imperatives (Aligned with SDG 13):** Sustainable Development Goal 13 emphasizes and focuses the urgent need at international level to address the climate change. This will be helpful in the process of exploration of Pakistan's climate related difficulties and susceptibilities.
2. **Enhancing Environmental Security Understanding:** Although Environmental security is getting acceptance on global level, still it is very less focused in international relations. By taking Pakistan as a case study, this research highlights the relationship between climate change, environmental security and human wellbeing. This knowledge base is essential for Pakistan and for further research in similar areas too.
3. **Empowering Local Communities and Decision-Makers:** This research provides the useful data for decision makers and local population by investigating the policy effectiveness, adaption tactics and local level efforts. By the adoption of the best practices and evidence based policies, security concerns resulted by climate change will be lessened. Furthermore, this study will provide the foresight for the establishment of adaption strategies to all stakeholder i.e. Govt. agencies and political leadership etc.
4. **Bridging the Policy-Implementation Gap:** Assessment of Pakistan's climate policies effect and execution will help to negate the gap between policy and implementation. Findings will be used as a guidebook for the improvement of current techniques. Policy makers may also use it as a reference to adopt new approaches that meets better the global climate targets.

5. **Strengthening International Collaboration:** Pakistan is a key player in global climate initiatives. This research inspects the Pakistan engagements, bilateral and with international organizations to handle the environmental security risks. It highlights the significance of global collaboration to combat climate change.

This research contributes to elevate the Pakistan's environmental security and living standard of its citizens. It will increase the understanding of climate change as a nontraditional security threat. It will not only be useful in future research it will also be helpful in policy making for environmental conservation and sustainable development.

## **CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

### **2.1. Literature Review**

A major non-traditional threat to the globe today is climate change. It is giving rise to several issues for countries worldwide. Pakistan is being negatively impacted by climate change due to its location in a region that is prone to it. This section explores the concept of climate change as a non-traditional security threat, focusing on potential implications for Pakistan's environmental security. This chapter examines several papers, reports, publications, and summaries of various facets of climate change. It explains different topics such as Pakistan's environmental challenges, the relationship between security and climate change, policy responses, Pakistan's contributions to SDG 13, and the importance of environmental security in the context of the country.

#### **2.1.1. Climate Change and Environmental Challenges in Pakistan**

##### **2.1.1.1. Glacial Melt and Water Scarcity**

Pakistan is facing several environmental problems that are made worse by global warming. Major issue in the environmental change is the temperature up rise. This severe problem causes several extreme weather events such as glacial recession, and changing patterns of precipitation. Chaudhry <sup>13</sup> highlights the increasing intensity of weather patterns and climatic fluctuations, which have an impact on various sectors like agriculture, cattle, and the food chain as a whole. Furthermore due to some other issues like increase in population, urbanization and poor resource management environmental deterioration is intensified <sup>14</sup>.

One of the most important environmental issues facing the world today is water scarcity. Pakistan's dependence on the Indus River system for irrigation, together with population pressures, glacier melt, and unproductive water resource management, have resulted in water stress and serious risks to livelihoods and agriculture <sup>15</sup>. It is especially alarming

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<sup>13</sup> Kinza Tasleem Chaudhry, "Environmental Policy Analysis of Pakistan: A Theoretical Perspective," *Journal of Development and Social Sciences* 3, no. 4 (2022): 507–21.

<sup>14</sup> Maham Zahoor, "Environmental Insecurity In Pakistan: Contemporary Challenges And Responses," *American International Journal of Humanities, Arts and Social Sciences* 4, no. 1 (2022): 1–6.

<sup>15</sup> Young-Woo Park, "The Environment and Climate Change: Outlook of Pakistan," *United Nations Environment Programme (UNEP)* 107 (2013).

because the Indus River is run by glacial melt from the Himalayas. Rising temperatures cause glaciers to retreat, which interrupts the river's seasonal flows and shrinks the amount of water available for domestic and agricultural usage <sup>16</sup>.

#### ***2.1.1.2. Agriculture and Food Security***

Pakistan is an agricultural nation where a sizable portion of the workforce works in this industry, contributing to the nation's economy. Water shortages and shifting weather patterns directly affect Pakistani agriculture. Change in temperature effected the precipitation patterns which eventually impacted the crop revenues. Which might result in lower agricultural production <sup>17</sup>. Food shortages that follow may make the nation's already high level of food insecurity worse.

#### ***2.1.1.3. Air Pollution and Health Risks***

Pakistan is not only dealing with water related challenges but also fighting with different environmental problems, like air pollution issues. Especially in urban areas poor air quality is itself an issue caused by vehicle emission, industrial pollution and crop burning. This is not only effecting Eco system but also causing serious health problem such as respiratory disorders and cardiovascular diseases <sup>18</sup>.

#### ***2.1.1.4. Deforestation and Biodiversity Loss***

In Pakistan, deforestation is another urgent environmental problem. Increase in population cause the need of more residential areas. To meet the required space significant deforestation has occurred throughout the nation <sup>19</sup>. The reduction in forest cover worsens environmental deterioration by causing habitat loss, soil erosion, and a decrease in water

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<sup>16</sup> Yong Nie et al., "Glacial Change and Hydrological Implications in the Himalaya and Karakoram," *Nature Reviews Earth & Environment* 2, no. 2 (2021): 91–106.

<sup>17</sup> Muhammad Aamir Khan et al., "Economic Effects of Climate Change-Induced Loss of Agricultural Production by 2050: A Case Study of Pakistan," *Sustainability* 12, no. 3 (2020): 1216.

<sup>18</sup> Muhammad Shehzaib Anjum et al., "An Emerged Challenge of Air Pollution and Ever-Increasing Particulate Matter in Pakistan; a Critical Review," *Journal of Hazardous Materials* 402 (2021): 123943.

<sup>19</sup> Fatima Khalid et al., "Deforestation Dynamics in Pakistan: A Critical Review: Deforestation Dynamics," *Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences* 57, no. 3 (2020): 27–34.

retention capacity <sup>20</sup>. The loss of biodiversity results from deforestation, which affects ecosystems and reduces the amount of natural resources available.

## **2.1.2. Climate Change as a Non-Traditional Security Threat**

### ***2.1.2.1. Evolution of Environmental Security***

By emphasizing climate change as a non-traditional security threat, the literature demonstrates the paradigm shift in security studies. In the past, security was primarily associated with military threats but with the passage of time this perspective has expanded to include a wide range of non-traditional security threats <sup>21</sup>. One well-known example of a problem that affects countries in ways other than armed aggression is climate change. It raises complicated security issues with regard to migration, resource shortages, food and water insecurity, and socioeconomic disturbances.

The idea of environmental security has undergone significant changes throughout time, with one of the key contributing factors being climate change. The World Commission on Environment and Development's 1987 report, "Our Common Future," highlighted how ecological conditions are essential for sustainable development <sup>22</sup>. It is commonly known that climate change is a "threat multiplier" and non-traditional security threat <sup>23</sup>. Environmental stresses have the power to destabilize governments and ignite conflicts more than today's political and economic condition combined <sup>24</sup>.

### ***2.1.2.2. Environmental Security in Pakistan***

In Pakistan, environmental and human security are closely related. Human security is directly impacted by climate change threats including floods, droughts, and glacier melt since

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<sup>20</sup> Muhammad Bahar Khan and others, "Deforestation In Pakistan And Its Influence On Natural Production," *International Research Journal of Social Sciences and Humanities* 2, no. 1 (2023): 36–44.

<sup>21</sup> B Buzan, "New Patterns of Global Security in the Twenty-First Century," *International Affairs* 67, no. 3 (1991): 431–51.

<sup>22</sup> Strategic Imperatives, "Report of the World Commission on Environment and Development: Our Common Future," *Accessed Feb 10* (1987): 1–300.

<sup>23</sup> Bruce Vaughn et al., *Security and the Environment in Pakistan* (Congressional Research Service, 2010).

<sup>24</sup> Rita Floyd, "The Environmental Security Debate and Its Significance for Climate Change," *The International Spectator* 43, no. 3 (2008): 51–65.

they result in food shortages, evictions, and financial losses <sup>25</sup>.The necessity of tackling these issues head-on is underscored by the connection of environmental security with other aspects of human security, such as economic, health, and food security <sup>26</sup>.

Furthermore, the dynamics of regional security are intimately related to environmental security. The conflict over water resources between Pakistan and India, a neighbor, significantly distorts the picture of environmental security <sup>27</sup>. In order to overcome such common environmental issues, International collaboration is crucial.

### ***2.1.2.3.Resource Scarcity and Conflict Potential***

Lack of resources in Pakistan deteriorated the climate change issue. One of the best examples of how resource shortage and security intersect is water resource management. Under the terms of Indus Water Treaty (1960) Pakistan and India were agreed to share the water of Indus River. However, the conflict over water-sharing continued. Furthermore by changing the river's flow it became more complicated and effected the climate change <sup>28</sup>. The battles over water sources shook the stability and security of the region.

## **2.1.3. Policy Responses to Climate Change-Induced Environmental Challenges**

### ***2.1.3.1.National Climate Change Policy (NCCP)***

Pakistan knows the climate change is a big security threat in the modern era, and taking measures to counter it. The National Climate Change Policy (NCCP) of 2021 is an important policy documents. The NCCP describes a broad range of goals designed to tackle the complex issues brought about by climate change <sup>29</sup>. These goals combine climate change policy with more general policies at national level like prioritizing the gender-sensitivity measures, improving the infrastructure and reducing the hazards that comes extreme weather. The policy also emphasizes on energy diversification, inter-ministerial and interprovincial coordination

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<sup>25</sup> Zahoor, "ENVIRONMENTAL INSECURITY IN PAKISTAN: CONTEMPORARY CHALLENGES AND RESPONSES."

<sup>26</sup> Chaudhry, "Environmental Policy Analysis of Pakistan: A Theoretical Perspective."

<sup>27</sup> Vaughn et al., *Security and the Environment in Pakistan*.

<sup>28</sup> J J Vater, "The Indus Waters Treaty: Prospects for India-Pakistan Peace," 2021.

<sup>29</sup> NCCP, "National Climate Change Policy 2021," 2021.

structures, and sustainable farming practices<sup>30</sup>. Pakistan still has a lot of work to materialize these policies, especially in terms of capacity and resources<sup>31</sup>. By the effective implementation of policies not only the effects of climate change can be reduced, it will also improve the environmental security situation.

#### ***2.1.3.2. Community-Based Adaptation Strategies***

Community based adaption schemes along with Govt. programs are more practical in Pakistan. These campaigns acknowledge the importance of local populations involvement in determining climate risks and creating appropriate adaption strategies for the environment<sup>32</sup>. Such programs provide local communities the authority to take charge of adaptation procedures and foster resilience at the community level.

#### **2.1.4. Pakistan's Contributions to SDG 13: Climate Action**

In SDG 13 Pakistan showed its effort to meet the national goal with the global agenda after realizing the severity of climate change<sup>33</sup>. Reducing greenhouse gas emissions, preparing for a changing climate, and lessening the consequences of climate change are the goals of the country's National Climate Change Policy and implementing strategies<sup>34</sup>. Pakistan ratified the Paris Agreement<sup>35</sup> which shows its commitment to fighting climate change globally. Furthermore, the government has created National Determined Contributions (NDCs), which outline the expected climate activities. These efforts include the integration of renewable energy, afforestation initiatives, and steps to improve resilience in sectors that are sensitive, such as agriculture and water resources. The implementation of the objectives outlined in SDG 13 present obstacles, notwithstanding these pledges and frameworks for the policy. To implement the climate action plans there are limitations like low technological capability, and insufficient budget. In order to guarantee efficient policy execution more coordination between

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<sup>30</sup> NCCP.

<sup>31</sup> Mohammad Aslam Khan et al., "The Challenge of Climate Change and Policy Response in Pakistan," *Environmental Earth Sciences* 75 (2016): 1–16.

<sup>32</sup> Samiullah Khan, "Climate Change Adaptation Strategies and Policies in Pakistan: A Critical Review," *Environmental Science and Pollution Research* 28, no. 29 (2021): 38434–49.

<sup>33</sup> Assemblée General, *Transforming Our World: The 2030 Agenda for Sustainable Development* (UN, 2015).

<sup>34</sup> Muhammad Mumtaz, "The National Climate Change Policy of Pakistan: An Evaluation of Its Impact on Institutional Change," *Earth Systems and Environment* 2 (2018): 525–35.

<sup>35</sup> UNFCCC, "Pakistan's Intended Nationally Determined Contributions," 2016.

different government ministers is needed which is also necessary to reduce bureaucratic obstructions.

## **2.1.5. Significance of Environmental Security in Pakistan**

### ***2.1.5.1. Human Security and Climate-Induced Migration***

The relationship between environmental security and human security is clear in the case of Pakistan. Droughts and floods, two natural disasters brought on by climate change, frequently push people to relocate both domestically and abroad. Communities that have been displaced often face greater vulnerability as they often face difficulties in obtaining homes, a source of income, and access to basic services <sup>36</sup>. These human security-related concerns require solutions for the nation's stability and the people's overall welfare.

### ***2.1.5.2. Regional Cooperation and Diplomacy***

Pakistan has taken part in regional cooperation and diplomatic initiatives in recognition of the global nature of environmental challenges. The Indus Waters Treaty is an excellent illustration of a water-sharing arrangement in the region, notwithstanding its challenges <sup>37</sup>. By taking such step to resolve other environmental risks such as air quality and disaster management, stability and security can be ensured in the region.

### ***2.1.5.3. Economic Implications***

Environmental security is necessary for economic stability in a country. Lack of resources and the calamities caused by climate change can result in substantial financial losses which eventually influence the GDP growth <sup>38</sup>. However, the economy can be stabilized by

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<sup>36</sup> Z Khan, "Climate Induced Migration in Pakistan: Global Discourse, Local Realities and Governance" (Islamic Relief Worldwide and Islamic Relief Pakistan, 2021).

<sup>37</sup> Md Nazrul Islam et al., "Climate Change Diplomacy, Adaptation, and Mitigation Strategies in South Asian Countries: A Critical Review," *India II: Climate Change Impacts, Mitigation and Adaptation in Developing Countries*, 2022, 1–32.

<sup>38</sup> Mudassar Hussain et al., "A Comprehensive Review of Climate Change Impacts, Adaptation, and Mitigation on Environmental and Natural Calamities in Pakistan," *Environmental Monitoring and Assessment* 192 (2020): 1–20.



shifting to green technologies and renewable energy sources which will create jobs that are in line with Pakistan's sustainable development objectives.

In conclusion, climate change has changed the security environment, highlighting the necessity of comprehensive strategies to protect Pakistan's environmental security, ensure the welfare of its people, and promote regional peace. Due to climate changes the environmental issues are getting worse in Pakistan. Deforestation, air pollution, agricultural vulnerability, glacier melt, water shortage, and biodiversity loss are some of these issues. The economy and human security are two major sectors that are considerably impacted by these issues. Recognizing the connections between environmental security and other aspects of human security and promoting regional cooperation are necessary to tackling these complicated problems. A thorough framework for climate change-related risk management may be found in Pakistan's National Climate Change Policy of 2021. To accomplish the desired aim, however, efficient policy implementation, a focus on community-based adaptation, and cross-border collaboration are required. Pakistan's main priority should be sustainable development, economic resilience, and human security as it navigates the complex challenges to the environment brought on by climate change. By doing this, Pakistan could be able to lessen the negative effects of climate change and seize opportunities for growth and prosperity in a changing environment.

## **2.2. Theoretical Framework**

To lay the groundwork for the selection of relevant theory, this chapter presents an overview of generally accepted perspectives on climate change and environmental security. The next part provides a quick overview of the theory's main components. In this context, the rationale for using securitization theory to investigate climate change as a non-traditional security issue in Pakistan has been explained.

### 2.2.1. Securitization Theory

Security has historically been associated with realism. But realism defines security very narrowly, using the state as its referent. Common security procedures include the use of force, the threat of using force, and the balance of power. Environmental concerns are viewed as "low politics" by the realists. The Copenhagen School's theory of securitization, which is primarily linked to the study of Barry Buzan and Ole Waever, is the most creative and analytical attempt to understand how security challenges are socially constructed<sup>39</sup>. In order to examine how climate change presents a non-traditional threat to Pakistan's environmental security, this study will apply securitization theory.

Securitization theory seeks to provide a thorough understanding of the dynamics of who (the securitizing actor) securitizes, on what problems (challenges/threats), for whom (the referent object), why, how, and when<sup>40</sup>. It asserts that a problem turns into a security concern when a strong securitizing actor—typically the state—claims that something is in danger and requires rapid attention to survive. This 'securitizing move' occurs when the audience accepts the threat, leading to extraordinary measures to counter it. Success in securitizing is not solely about performing the speech act but also hinges on the capacity to influence and gather belief. Buzan et al. contend that successful securitization involves framing an issue as beyond 'normal politics,' elevating it to a special or above-politics status<sup>41</sup>. The securitizing actors, comprising political leaders, bureaucracies, governments, lobbyists, and pressure groups, perform the security speech act, while the referent object faces an existential threat and requires safeguarding for legitimate survival claims<sup>42</sup>.

The act of presenting an issue as a security threat, irrespective of a real existential threat, marks the practice of security. This presentation elevates the issue's importance, detaching it from regular politics. Buzan et al. stress the significance of constituting the threat with substantial political effects for a successful securitization. Environmental security pertains to

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<sup>39</sup> Maria Julia Trombetta, "Environmental Security and Climate Change: Analysing the Discourse," *Cambridge Review of International Affairs* 21, no. 4 (2008): 585–602.

<sup>40</sup> Mathias Albert and Barry Buzan, "Securitization, Sectors and Functional Differentiation," *Security Dialogue* 42, no. 4–5 (2011): 413–25.

<sup>41</sup> Jyoti M Pathania, "BANGLADESH: Non-Traditional Security," *South Asia Analysis Group Paper*, no. 751 (2003).

<sup>42</sup> Monika Barthwal-Datta, *Understanding Security Practices in South Asia: Securitization Theory and the Role of Non-State Actors* (Routledge, 2012).

preserving the local and planetary biosphere, crucial for human enterprises<sup>43</sup>. The success of securitization relies on the capabilities of the securitizing actor; greater capabilities increase the likelihood of success.

Three crucial components of the securitization process are identified by the theory. The referent object comes first. This is the thing that's under threat. The state, the environment, or the Pakistani people might all be referent objects in the event of climate change. The securitizing actor comes in second. This is the person who portrays the situation as a security risk. This might be a government figure, a non-governmental group, etc. in the case of climate change. The audience comes last. This is the group of people who have been convinced to view the problem as a security threat by the securitizing actor. This might be the general population, the government, or the entire international community in the case of climate change.

The security of Pakistan's environment is being threatened by climate change. The effects of climate change are already being felt throughout the nation, and they will probably get worse in the future. As a result, there can be an increase in warfare, a shortage of resources, a refugee crisis, and economic instability. This framework will direct the analysis and suggestions in the thesis based on the Securitization Theory's findings.

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<sup>43</sup> Barry Buzan, Ole Wæver, and Jaap De Wilde, *Security: A New Framework for Analysis* (Lynne Rienner Publishers, 1998).

## **CHAPTER 3: RESEARCH METHODOLOGY**

The systematic way to analyze the complex facts of "Climate Change as a Non-Traditional Security Threat: Case Study of Environmental Security in Pakistan" is outlined in this chapter. For the sake of analyzing the objectives of the study: research method, research design, data collection method, data analysis technique and research ethics and limitations of the study are described in this chapter. A framework is provided in this chapter for navigating through the academic literature, policy documents, official statements, reports and other textual resources that are essential for exploring the intricate relationship between climate change and environmental security in Pakistan.

### **3.1. Research Method**

The link between Pakistan's environmental security and climate change is complex. The qualitative research approach is used to examine this link. This is also used to examine the effects of climate change on environmental security of Pakistan. The ability of the qualitative technique to examine intricate problems and phenomena is the deciding factor in its adoption. It makes it possible to thoroughly examine the complex relationships that exist between environmental security and the effects of climate change.

### **3.2. Research Design**

The study focuses on Pakistan as an analytical unit. Case-study research design is used to explore the climate change and environmental security. This makes it easier to study the country's actions, vulnerabilities and policies related to environmental security and changing climate. The use of case study gives detailed examination and better understanding of the problem by allowing a thorough investigation of real-world situations and their consequences.

### **3.3. Data Collection**

The data is collected from different sources. The main sources include official statements, government records and publications, reports, academic literature and other textual material related to climate change and environmental security. These source serve as the main source for thematic analysis.

### **3.4. Data Analysis**

Thematic analysis is used as the main method for analyzing the collected textual data from different sources. Thematic analysis finds the themes, popular narratives and policy emphasis related to the topic.

### **3.5. Research Ethics**

Research ethics are a set of rules that tells what a researcher should and shouldn't do during the research. Researchers have limitations imposed by the rules of institutions. The integrity and safety of the research process and its participants are protected by these principles. Several important aspects are included in the ethical concerns that are essential to this study, including:

- 1) The ethical framework for this research is based on adherence to the regulations and standards provided by Bahria University.
- 2) No harm to any living organism is ensured throughout the study.
- 3) The study's sources are all correctly cited.
- 4) A thorough examination and confirmation process has been carried out to guarantee the precision and legitimacy of every reference included in the research.
- 5) This study's data and conclusions are all real, based on sincere observations.
- 6) Strict measures have been taken to reduce biases, and the study process has been conducted with objectivity.
- 7) This study's main objective is to offer new insights on the subject.

### **3.6. Limitations**

It is essential to recognize the constraints within this study. Even while qualitative research is full of insights, it is not as generalizable as quantitative research. The results might not be totally applicable to other areas and are context-specific. The research's breadth is limited by time, restricted access to certain confidential documents, lack of data, and resource constraints. Furthermore, the absence of in-person interactions with stakeholders through focus groups or interviews further restrict the breadth of knowledge on local viewpoints and community responses to environmental security issues in Pakistan. To get important insights into the goals of the study, the research, nevertheless, makes sure that the textual data sources are thoroughly analyzed and interpreted.

## CHAPTER 4: CLIMATE CHANGE: A NON-TRADITIONAL SECURITY THREAT FOR PAKISTAN

### 4.1. Climate Change

The 5th Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) delineated that climate change occurs primarily due to anthropogenic activities. It defines climate change as a deviation in climate patterns directly or indirectly linked to human activities, altering the composition of the global atmosphere alongside natural climate fluctuations over similar time spans<sup>44</sup>. While global climate alterations have been ongoing for centuries without much alarm, recent trends over the last five decades have triggered significant concern among the scientific community. Although Dressler and Parson highlight human contributions, they also highlight other elements such as geological processes, internal variability of the Earth, solar variability, orbital variation, and volcanic activity<sup>45</sup>.

In their work "Climate Change Reconsidered," Idso, Singer, and Fred introduced the "Bi thermostat Theory"<sup>46</sup>. According to this notion, a variety of naturally occurring elements and compounds, including carbon dioxide, iodocompound, and carbonyl sulphide, are in equilibrium. However, recent research indicates a disruption in this equilibrium due to human activities, causing an imbalance as the produced chemicals surpass the natural absorption capacity. Roger Pielke introduced the "Human Forcings Theory" of climate change, asserting that humanity's most significant impact on climate stems not solely from greenhouse gas emissions but also from the transformation of Earth's surface through deforestation, desert irrigation, and urban development<sup>47</sup>.

### 4.2. Security

Security, as a concept, has undergone diverse interpretations. Paul D. Williams characterizes it as an "essentially contested concept," implying an inherent lack of consensus

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<sup>44</sup> Pachauri et al., *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*.

<sup>45</sup> Andrew E Dessler and Edward A Parson, *The Science and Politics of Global Climate Change: A Guide to the Debate* (Cambridge University Press, 2019).

<sup>46</sup> Joesph L Bast, *Seven Theories of Climate Change* (Heartland Institute Chicago, 2010).

<sup>47</sup> Bast.

regarding its meaning <sup>48</sup>. Scholars perceive security as a broad and elusive domain, acknowledging its varied interpretations among different individuals. It embodies a state of assured confidence among actors to confront challenges, encompassing any threat or phenomenon capable of compelling a nation to alter its fundamental values and way of life <sup>49</sup>. Ensuring security stands as a fundamental responsibility of the State, traditionally centered on defending against military threats from other states. However, in the non-traditional realm, threats manifest as intricate, all-encompassing, and interwoven factors.

The term "national security," when first introduced by U.S. Secretary of the Navy James Forrestal in the mid-1940s, primarily aligned with political realism, aiming to preserve a nation-state's integrity against external hostility <sup>50</sup>. Within the South Asian context, governments historically emphasized safeguarding territorial integrity and perpetuating political power. Consequently, the crucial question arises regarding how the political elite can be persuaded to acknowledge and address emerging non-traditional security challenges.

### **4.3. Security - Copenhagen School**

Security has always been primarily associated with realism, which provides a limited notion of security with the state as its center. Realists typically limit environmental issues to the purview of "low politics," emphasizing the distribution of power and the use or threat of force as the major sources of security concerns. The concept of securitization is a revolutionary attempt to comprehend the social construction of security, made popular by the Copenhagen School and most closely associated with the works of Barry Buzan and Ole Waever <sup>51</sup>.

The securitization theory posits that threats aren't objective entities awaiting discovery; instead, various issues can assume the status of security concerns through successful speech acts within a political community. Through this perspective, security is not just a concept or a set of rules; rather, it is a social practice in which a problem that is classified as a security concern undergoes a radical change in the way it is handled <sup>52</sup>. The Copenhagen School, led by

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<sup>48</sup> Paul D Williams, *Security Studies: An Introduction* (Routledge, 2012).

<sup>49</sup> Williams.

<sup>50</sup> Barthwal-Datta, *Understanding Security Practices in South Asia: Securitization Theory and the Role of Non-State Actors*.

<sup>51</sup> Trombetta, "Environmental Security and Climate Change: Analysing the Discourse."

<sup>52</sup> Trombetta.

Barry Buzan, Ole Waever, and Jaap de Wilde, emerged from the Conflict and Peace Research Institute (COPRI) in Copenhagen and challenges the conventional focus of security studies on conflict and military action by advocating for a broader assessment of the security agenda. This framework broadens the concept of security and identifies different types of security threats, including military, economic, environmental, societal, and political security. It emphasizes a multi-sectoral approach and addresses criticisms of intellectual incoherence by traditionalists.

According to Buzan et al., "security is about survival," emphasizing that when an issue is portrayed as an existential threat to a designated referent object, it assumes a security dimension<sup>53</sup>. By including threats from non-state actors, the Copenhagen School's paradigm expands the traditional idea of security by classifying security into five main sectors, four of which are non-military. Buzan contends in "People, States and Fear" that security affects all human collectivities and isn't just a state issue, challenging the conventional security theories. Buzan distinguishes three schools of thought: critical security studies, which challenge the conceptual underpinnings of security, traditionalists, who expand security beyond the military, and wideners<sup>54</sup>. All sectors are briefed shortly as under:

#### **4.3.1. Military Sector**

Military security, which is sometimes confused with state security, is concerned with how nations' armed forces interact in terms of both offensive and defensive capabilities. It also includes how each state views the other's military preparedness and intentions. The state's territorial integrity is usually the referent object inside this domain. While traditionalists have long viewed military security as the linchpin of security studies, 'wideners' diverge from this perspective. The conventional narrow focus on military aspects in security studies has encountered challenges as the field has expanded its conceptual boundaries. In Pakistan's context, the validity of military threats to national security remains pronounced due to the intricate geopolitical landscape. However, relegating non-traditional threats to a lower priority would be shortsighted. The impact of climate change, for instance, directly affects coastal defense installations, while alterations in river flows can significantly compromise land-based defenses, particularly along water barriers.

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<sup>53</sup> Buzan, Wæver, and De Wilde, *Security: A New Framework for Analysis*.

<sup>54</sup> Barry Buzan, *People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era* (ECPR press, 2008).



### **4.3.2. Political Sector**

The fundamental stability of governments, administrative structures, and the philosophies that support their legitimacy are the main issues of political security. Within this domain, sovereignty and a state's ideology often serve as the referent objects. Existential threats to sovereignty can arise from factors challenging a nation-state's legitimacy, recognition, and authoritative structure. Such threats manifest when regulations, institutions, and norms that drive their evolution are undermined, potentially endangering international organizations and regimes <sup>55</sup>. Climate change-induced resource scarcity, for instance, is identified as an existential challenge to Pakistan's political security.

### **4.3.3. Economic Sector**

Access to the markets, funds, and resources needed to sustain acceptable levels of prosperity and state power is included in economic security. It operates on both micro and macro scales: at the micro level, it involves ensuring the sustenance of people's livelihoods, while at the macro level, it emphasizes access to resources, production means, and services. Climate change has a substantial effect on a nation's ability to maintain economic stability, especially when it comes to agriculture, which is heavily dependent on temperature changes, fresh water availability, the availability of fertile land, and a skilled labor force.

### **4.3.4. Societal Sector**

Societal security centers on preserving the continuity and development of established cultural, linguistic, religious, and national identity patterns <sup>56</sup>. According to Wæver, societal insecurity arises when significant societal groups perceive threats to their identity due to factors like immigration, integration, and cultural dominance, leading them to strive for self-preservation <sup>57</sup>. Collective identities such as nations and religions serve as the referent objects within this societal realm. Social unrest is a result of challenges to established national identities and cultural norms. The impacts of climate change-induced resource scarcity might compel individuals to temporarily or permanently migrate from their homes, challenging the identity of both climate refugees and the host states or regions. This situation poses concerns linked to societal insecurity. Considering that nearly half of Pakistan's workforce is engaged in

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<sup>55</sup> Buzan, Wæver, and De Wilde, *Security: A New Framework for Analysis*.

<sup>56</sup> Buzan, Wæver, and De Wilde.

<sup>57</sup> Mely Caballero-Anthony, "An Introduction to Non-Traditional Security Studies: A Transnational Approach," *An Introduction to Non-Traditional Security Studies*, 2015, 1–296.

the agricultural sector, challenges related to climate change become integral to societal security concerns.

#### **4.3.5. Environmental Sector**

The balanced preservation of the planetary biosphere is crucial for humanity's survival, and any disruption in its life-sustaining functions leads to environmental insecurity<sup>58</sup>. Buzan, Wæver, and Wilde delineate three threat relationships that define the spectrum of environmental security<sup>59</sup>. Firstly, if threats to humanity are perceived as natural rather than anthropogenic, policymakers might approach interventions differently, acknowledging that some calamities like earthquakes stem from uncontrollable natural processes. Second, as demonstrated by the depletion of the ozone layer owing to human-generated CFCs, human activity presents an existential danger to security when it is acknowledged that it is generating environmental issues. Thirdly, environmental changes stemming from human activity may not necessarily jeopardize human civilization's existence, as seen in resource depletion where humans possess the capacity to innovate alternative solutions, such as renewable energy sources, mitigating the issue.

Environmental security, as part of non-traditional security, extends and deepens the security paradigm by expanding its focus beyond war-related risks. Climate change, a significant environmental issue, impacts the entire globe, albeit with varying effects in different regions.

#### **4.4. Non-Traditional Security**

After the Cold War ended, the world of globalization and interdependence changed, leading academics to reevaluate security as a concept. Non-traditional security challenges saw a boom in the latter half of the 20th century. Bajpai emphasized that the idea of non-traditional security and human security originated with the findings of international independent commissions made up of prominent thinkers, leaders, and academics<sup>60</sup>. The Club of Rome, commencing in the 1970s, produced volumes addressing the world's problematique, emphasizing a complex array of global concerns affecting people worldwide: poverty,

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<sup>58</sup> Jon Barnett, *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era* (Zed Books, 2001).

<sup>59</sup> Buzan, Wæver, and De Wilde, *Security: A New Framework for Analysis*.

<sup>60</sup> Kanti P Bajpai, *Human Security: Concept and Measurement* (Citeseer, 2000).

environmental degradation, youth alienation, erosion of traditional values, inflation, and economic disruptions<sup>61</sup>.

In 1980, the independent Brandt Commission's "North South Report" reshaped perceptions of development and security by identifying hunger, widespread suffering, and the disparity between the privileged and underprivileged as security threats<sup>62</sup>. In addition, sufficient food and freedom from poverty were emphasized as essential components of common security in the 1980 "common security" report of the Independent Commission on Disarmament and Security. NTS-Asia defines non-traditional security issues as risks to national security and welfare that predominantly come from non-military sources. Infectious illnesses, resource scarcity, climate change, uncontrolled migration, food shortages, smuggling, the illegal drug trade, and international crime are just a few of these challenges. Due to their universal nature, these risks often call for broader responses than just unilateral ones in the political, economic, social, and humanitarian domains<sup>63</sup>.

In 1991, the "Stockholm Initiative on Global Security and Governance" broadened the security paradigm to encompass threats arising from environmental concerns, population growth, natural calamities, and disasters. The World Bank report emphasized the importance of individual security beyond territorial security<sup>64</sup>. In its 1995 report, the Commission on Global Governance proposed expanding the definition of global security beyond the traditional state-centric definition to include environmental security as well as the security of people and the planet.

#### **4.5. Non-Traditional security Threat**

Non-traditional security threats are different from usual ones in their nature and scope. Traditional security threats, based on the realist viewpoint, mainly revolve around military attacks and keeping countries safe<sup>65</sup>. On the other hand, Non-traditional security threats include a wider range of challenges including economic, environmental, and human security concerns.

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<sup>61</sup> Pathania, "Bangladesh: Non-Traditional Security."

<sup>62</sup> James Bernard Quilligan, "The Brandt Equation: 21 St Century Blueprint for the New Global Economy," 2002.

<sup>63</sup> Caballero-Anthony, "An Introduction to Non-Traditional Security Studies: A Transnational Approach."

<sup>64</sup> World Bank, *World Development Report 1994: Infrastructure for Development* (The World Bank, 1994).

<sup>65</sup> Medani P Bhandari, "Climate Change Impacts on Agriculture, a Case Study of Bangladesh, India, Nepal, and Pakistan," *SocioEconomic Challenges* 5, no. 2 (2021), [https://doi.org/10.21272/sec.5\(2\).35-48.2021](https://doi.org/10.21272/sec.5(2).35-48.2021).

These can involve problems like changing climate, terror attacks, cross border crime and health security<sup>4</sup>. Unlike traditional security threats, Non-traditional security threats often have hard-to-grasp, complex and multifaceted impacts, creating economic, societal, and political instability, and increasing the risk of conflict. They make it less safe for people to get along well with each other<sup>66</sup>. The evolving nature of non-traditional security threats has led to a new way of thinking about keeping security. This now shows how important it is to deal with both traditional and non-traditional threats that could threaten security today<sup>67</sup>.

Non-traditional security threats come from sources like climate change, shortage of resources, infectious diseases and other problems. These risks are often cross border, making single solutions inadequate and needing thorough - political, economic and social actions. Non-traditional security threats focus on non-military threats with these common characteristics:

1. In terms of their perceptions, sources, and consequences, the threats are international in character.
2. Frequently described in political and economic terms, they do not originate from state-to-state conflict or changes in the balance of power<sup>68</sup>.
3. Non-traditional security concerns including resource shortages and irregular migration put society and politics in unstable situations, which makes them security concerns.
4. Human-caused disruptions to the delicate natural balance of the environment, such as climate change, can have disastrous effects on nations and communities that are sometimes hard to undo or recover<sup>69</sup>.
5. Since national remedies are frequently insufficient, regional and global collaboration would be required.
6. The people (survival, well-being, dignity) at the individual and social levels are now the referents of security, not merely the state (state sovereignty or territorial integrity).

People face security threats in two ways, called traditional or nontraditional. As Hove, Ngwerume and Muchemwa said in 2013, non-traditional threats are a quiet and very

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<sup>66</sup> N Abas et al., "Review of GHG Emissions in Pakistan Compared to SAARC Countries," *Renewable and Sustainable Energy Reviews*, 2017, <https://doi.org/10.1016/j.rser.2017.04.022>.

<sup>67</sup> Naeem Akram and Abdul Hamid, "Climate Change: A Threat to the Economic Growth of Pakistan," *Progress in Development Studies* 15, no. 1 (2015), <https://doi.org/10.1177/1464993414546976>.

<sup>68</sup> Akram and Hamid.

<sup>69</sup> Akram and Hamid.

ruthless thing happening right now. But it's not getting enough attention because they are overshadowed by traditional military security issues <sup>70</sup>.

Researchers say that around the world, nearly 30 human pathogens have happened. About three-quarters (75%) of these were related to animals and one-fourth (25%) was caused by changes in weather conditions <sup>71</sup>. This means that climate change is a major security threat for humans, and it causes serious problems all over the world. Africa is usually mentioned as the continent that's most vulnerable to adverse effects of climate change. Climate change is now being seen as a threat to peace and security on the world stage.

Non-traditional security threats can't be contained by normal army and police methods or other common methods of handling threats. So, these non-traditional security threats to security don't just put human lives at risk but also break down the growth of social progress, political rules in world affairs and economy <sup>72</sup>.

#### **4.6. Climate Change; A Non-Traditional Security Threat for Pakistan**

Climate change, identified as a non-traditional security threat, presents formidable challenges to Pakistan's Security. It makes it hard for the government and social order in the nation. This issue is being seen as a critical threat for countries all over the world. It affects both developed and undeveloped countries. In the last 20 years, Pakistan has faced big problems caused by changes in weather patterns <sup>73</sup>.

From 2010 to 2023, the country flooded every two years. This caused substantial damage in the form of human and economic losses. Efforts have been made in the last two decades to fix this problem, but they haven't become a big revolution yet. The impacts and challenges of growing climate change on Pakistan's security are very complex. Climate change has turned into a new kind of threat, threatening to destroy both the state and society <sup>74</sup>.

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<sup>70</sup> Melissa Dell, Benjamin F Jones, and Benjamin a Olken, "Climate Shocks and Economic Growth: Evidence from the Last Half Century," *Africa* 21, no. 3 (2008).

<sup>71</sup> Simon Levine, Eva Ludi, and Lindsey Jones, "Rethinking Support for Adaptive Capacity to Climate Change," *Oxfam Policy and Practice: Climate Change and Resilience* 7, no. 5 (2011).

<sup>72</sup> Levine, Ludi, and Jones.

<sup>73</sup> F Lecocq and Z Shalizi, "How Might Climate Change Affect Economic Growth in Developing Countries? A Review of the Growth Literature with a Climate Lens," *World Bank Policy Research Working Paper*, 2007.

<sup>74</sup> Maya Bogers et al., "The Impact of the Sustainable Development Goals on a Network of 276 International Organizations," *Global Environmental Change* 76 (2022), <https://doi.org/10.1016/j.gloenvcha.2022.102567>.

Climate experts say that climate changes are a daunting threat to modern states and nations, especially if seen as a threat to national security or the ability of a state to protect its people. The importance of this is shown in the fact that, even though Pakistan has low levels of harmful greenhouse emissions yet it's still very prone to artificial and natural disasters like floods, earthquakes, capacity limitations, and other cataclysms. Notably, problems from mass displacement and the danger to important places during floods add pressure on the state's system. This needs a comprehensive and immediate reaction for this complex security issue <sup>75</sup>.

Climate change manifests as rising temperatures, changed rainfall patterns, melting glaciers and worsening floods. Yet, when natural disasters like storms or fires happen, poor governance and worse decisions can further exacerbate the impact on living and non-living entities. Poor and underdeveloped countries, which don't have the apparatuses to counteract the consequences of global warming are hit harder by it. There is a growing concern that these crises are intensifying in severity and frequency, directly threatening the security of both individuals and governments <sup>76</sup>.

Pakistan has seen shattering floods many times in its past. The recent ones in 2010 and 2022 made things harder, exacerbating economic, social, and security issues all over the country. The altered rainfall pattern in these years resulted in massive humanitarian crises, leading to substantial loss of lives on a wide scale <sup>77</sup>. With these floods, Pakistan has increased its susceptibility to climate change, even though it contributes less than 1% of global greenhouse gas emissions <sup>78</sup>. When crops, homes and buildings are destroyed lots of people move from rural places into cities. This happens because millions lose their houses. These floods have been linked to more crime, forced migration of people and women being less safe in the country. They are also connected with increased sickness.

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<sup>75</sup> Regina Scheyvens et al., "Indigenous Tourism and the Sustainable Development Goals," *Annals of Tourism Research* 90 (2021), <https://doi.org/10.1016/j.annals.2021.103260>.

<sup>76</sup> S Mostafa Rasoolimanesh et al., "A Systematic Scoping Review of Sustainable Tourism Indicators in Relation to the Sustainable Development Goals," *Journal of Sustainable Tourism* 31, no. 7 (2023), <https://doi.org/10.1080/09669582.2020.1775621>.

<sup>77</sup> Jiang Xiuhui and Muhammad Yousaf Raza, "Delving into Pakistan's Industrial Economy and Carbon Mitigation: An Effort toward Sustainable Development Goals," *Energy Strategy Reviews* 41 (2022), <https://doi.org/10.1016/j.esr.2022.100839>.

<sup>78</sup> Khurram Shahzad et al., "Assessment of Biomass Energy Barriers towards Sustainable Development: Application of Pythagorean Fuzzy AHP," *Geological Journal* 58, no. 4 (2023), <https://doi.org/10.1002/gj.4680>.

The flood in 2022 cost over US\$30 billion (about \$92 per person in the US) and made the whole world more aware of this significant issue. The Group of 77 countries established a "Fund for Loss and Damage" at COP 27 in Sharm el Sheikh, Egypt <sup>79</sup>. This was done to assist countries impacted by climate change. However, there is a serious lack of accountability at the provincial level, which makes it difficult to provide money to flood victims. The melting of glaciers and rising temperatures in Pakistan have resulted in severe issues including food scarcity, poverty, mass migration, and water scarcity. Not only is climate change a natural occurrence, but human action has also contributed significantly to these catastrophes.

As a developing country, Pakistan works with international organizations to address the world's climate problem. Since Pakistan is mostly an agricultural country, water security is very important for its survival and stability. Climate change has enhanced water insecurity, impacting agriculture because quality crops depend on water to grow well. Also, the increasing changes in river flow because of melting glaciers and altered rainfall patterns create more problems. The annual rise in sea level along the Karachi coast further adds to environmental concerns <sup>80</sup>. Pakistan is predicted to have a 3-5 degree annual temperature increase and a 60-centimeter rise in sea level by the end of this century. An increase in temperature may also result in a greater demand for energy. The life of the nation depends on water security, according to political leaders <sup>81</sup>. The dispute between India and Pakistan further intensifies the water shortage problem.

Wars between the two hostile South Asian countries might result from the securitization of climate change. On the global scene, the securitization of climate change has gained significant importance, igniting worries and increasing hopes for substantive progress. This change is because people now know that security problems are very important in politics. In the modern world, changing climate has evolved into a critical aspect of states' security functioning as a multiplier threat that intertwines with prevailing economic, societal, political security, and environmental challenges. The collective impact of these issues causes

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<sup>79</sup> Khaled Obaideen et al., "The Role of Wastewater Treatment in Achieving Sustainable Development Goals (SDGs) and Sustainability Guideline," *Energy Nexus* 7 (2022), <https://doi.org/10.1016/j.nexus.2022.100112>.

<sup>80</sup> Shahzad et al., "Assessment of Biomass Energy Barriers towards Sustainable Development: Application of Pythagorean Fuzzy AHP."

<sup>81</sup> Enara Zarrabeitia-Bilbao et al., "World Environment Day: Understanding Environmental Programs Impact on Society Using Twitter Data Mining," *Social Indicators Research* 164, no. 1 (2022), <https://doi.org/10.1007/s11205-022-02957-y>.

considerable challenge to Pakistan's national security<sup>82</sup>. In the future, a climate change expert warns that if substantial steps are not taken regarding global warming, shortage of water, poor infrastructure, and rapid population growth in Pakistan, situation could get bad to dismantle Pakistan as an organized state and society<sup>83</sup>.

According to Lieven, the most non-traditional threat to Pakistan's security is climate change<sup>84</sup>. The heaviest floods occurred in 2022, primarily in Khyber Pakhtunkhwa (KP) and Swat. The worst and most destructive flood in Pakistani history occurred at this time. Buildings were damaged, individuals died, and their houses were evacuated. It exacerbated security and economic difficulties, hurt agriculture, and made poverty soar. Speaking with a Swat native, it became clear that they were completely helpless throughout the crisis and that neither the province nor federal governments responded quickly enough<sup>85</sup>. The residents had encroached on land by the riverside to build hotels without getting permission from the authorities first. Any change to a state's territory has an influential impact on the state's security. Any physical change to the territory of a state is considered a threat to its sovereignty. Geographical location also plays an important role in determining national security, particularly with risks caused by melting glaciers and rising sea levels. National security is a complicated concept, consisting of external territorial, internal, societal, and human security, as well as considerations such as terrorism, extremism, and the interplay between external and internal security, soft power, and influence, as noted by Hassan Askari.

Nowadays, the way we think about security has changed. Not just traditional security threats but also non-traditional threats have made it harder to be safe. For example, climate change can affect businesses and the economy a lot. So much so that it is seen as an economic security matter<sup>86</sup>. The potential impact of climate change extends to various pillars of state power, including the population, military, intelligence capacity, social factors, and behaviors

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<sup>82</sup> Margaret E Byerly, "A Report to the IPCC on Research Connecting Human Settlements, Infrastructure, and Climate Change," *Pace Environmental Law Review* 28, no. 3 (2011), <https://doi.org/10.58948/0738-6206.1680>.

<sup>83</sup> Zarrabeitia-Bilbao et al., "World Environment Day: Understanding Environmental Programs Impact on Society Using Twitter Data Mining."

<sup>84</sup> Byerly, "A Report to the IPCC on Research Connecting Human Settlements, Infrastructure, and Climate Change."

<sup>85</sup> Donald Fever and Benedict Sheehy, "Climate Policy And Border Adjustment Regulation : Designing A Coherent Response," *Melbourne Journal of International Law* 13 (2012).

<sup>86</sup> Ann Sussman and Justin Hollander, *Cognitive Architecture: Designing for How We Respond to the Built Environment* (Routledge, 2021).



<sup>87</sup>. A remarkable event happened in 2012 when an avalanche hit an army base at Siachen, trapping over 150 soldiers. It showed that even the military is vulnerable to climate change. Harsh climatic conditions in glaciers, seas, or on the ground can precipitate significant disasters for a country.

The earth's natural environment has been drastically altered by the interaction of industrial development, cutting-edge technology, population increase, and poor resource management in emerging nations, posing a serious threat to state and societal existence <sup>88</sup>. The increasing effects of climate change are posing a serious danger to human security, since the local population and communities' values are significantly impacted by environmental consequences <sup>89</sup>. Baluchistan became the new home for people from Southern Sindh during the current water catastrophe. As a result, there was an increase in theft and human trafficking, particularly involving young women and girls <sup>90</sup>. Human security is jeopardized, criminal groups become active, and criminal activity escalates amid man-made and natural disasters.

Global security is significantly threatened by climate change. Pakistan is an impoverished nation that finds it difficult to respond quickly to issues like "natural disasters." The United Nations High Commissioner for Refugees warned in 2008 that climate change may force many people to flee their homes <sup>91</sup>. They guessed that about 250 million people would become refugees because of the climate. They might have to leave their homes in climate-related situations like floods, droughts, hurricanes and food shortages from it. In Pakistan, the two biggest floods in 2010 and 2022 made people leave their homes. They moved to other places like cities or new areas inside the country <sup>92</sup>.

In 2022, a devastating flood hit Baluchistan. This province is already dealing with artificial and natural catastrophes. The flood immensely affected the underprivileged population of Baluchistan. The flood washed away mud houses, animals and crops. It also harmed bridges,

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<sup>87</sup> Damodar Gaire and Jyotshna Amatya, "Impacts Assessment and Climate Change Adaptation Strategies in Makawanpur District, Nepal," *Focus*, 2008.

<sup>88</sup> Gabe Bullard, "See What Climate Change Means for the World's Poor," *National Geographic*, 2015.

<sup>89</sup> Rachel Slater, Rebecca Holmes, and Nicholas Mathers, "Food and Nutrition (in-) Security and Social Protection," 2014.

<sup>90</sup> Slater, Holmes, and Mathers.

<sup>91</sup> Bilal Aslam, Shabnam Gul, and Muhammad Faizan Asghar, "Evaluation of Environmental Degradation as an Unprecedented Threat to Human Security in Pakistan," *Liberal Arts and Social Sciences International Journal (LASSIJ)* 5, no. 1 (2021): 197–211.

<sup>92</sup> Aslam, Gul, and Asghar.

telecommunication, and rail networks. Food security was put at greater risk as a result of this destruction, which cut off Baluchistan from the rest of the nation. Many mud homes, animals and crops were either totally or partly washed by the flood waters<sup>93</sup>.

During the flood, Lieutenant General Sarfraz Ali who supervised the rescue operation in Baluchistan sadly died along with his team. The aftermath of the 2022 flood has made provincial and central authorities concerned about the threat of climate change. Some areas in Sindh were badly hit by the horrible flood. But, just like those in Punjab, Baluchistan and Khyber Pakhtunkhwa (KP), people had to face similar difficulties and problems. However, the Sindh government failed to provide sufficient relief. This caused people to protest and get upset. After that, the Supreme Court of Pakistan got involved. They gave the province's local government instructions to provide information on management and aid in Sindh. According to Chief Justice Umar Atta Bandial, the problem of flooding is not only one of management but also a fundamental human right<sup>94</sup>.

The floods that occurred in Pakistan in 2023 are expected to have cost the country over \$30 billion in damages. Numerous industries have been severely impacted by the floods, including housing, transportation and communications, agriculture and livestock, and agriculture. According to the post-disaster needs assessment, there would be more than \$14.9 billion in total damages and almost \$15.2 billion in economic losses<sup>95</sup>. A lot of lives have been lost in Pakistan due to sudden monsoons, changing rainfall patterns and devastating floods. The proof shows that more people have died in Pakistan because of heavy rainfall and devastating floods than from acts of terror. This points out how much the country is at risk of non-traditional security threats. Security threats from changes in climate include many things, like interprovincial fights, poor living conditions due to lack of necessities and mass displacement inside a country. It is estimated that urban mass displacement may reach 70% by the end of the century. Consequently, "climate change poses a serious threat to the safety and security of Pakistan"<sup>96</sup>.

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<sup>93</sup> Consultancy Pakistan et al., "Journal of Business and Social Review in Emerging Economies," 2020.

<sup>94</sup> A Alam and S Gul, "Global Climate Change: A Threat Multiplier to Pak-Afghan Constrained," 2021.

<sup>95</sup> Mahvish Malik and Misbah Arif, "Managing Non-Traditional Threats by Using Space Technology: A Case of Pakistan," *NUST Journal of International Peace and Stability*, 2019, <https://doi.org/10.37540/njips.v2i2.30>.

<sup>96</sup> Rodriguez Sampedro, "The Sustainable Development Goals (SDG)," *Carreteras* 4, no. 232 (2021), <https://doi.org/10.1201/9781003080220-8>.

In Pakistan, the agriculture sector serves as a major source of income and employment for the residents. As agriculture is highly dependent on seasonal rains, the shift in climate poses a significant impact on food security. Despite being a critical issue, this problem is ignored by the administration. Food security poses a significant threat to human security. It is evident from the Syrian civil war in which food security served as a significant contributing factor to the war<sup>97</sup>. Right now, Pakistan is ranked as 14th country out of 17 countries which are at the risk of extreme water shortage. Pakistan's ground water sources are depleting quickly, and it is estimated that Pakistan might face water scarcity by 2025<sup>98</sup>.

In the last two decades, Pakistan has always been in a list of 10 vulnerable countries on the Climate Risk Index. A vulnerability is shown by 10,000 dead people from disasters connected to climate and money losses of about \$4 billion because of 173 extreme weather events. Climate change and related problems like water shortage can escalate resource conflicts. Big storms caused by climate, like severe floods, can make problems worse between groups that have fought before. For example, during the 2022 flood people from Sindh who are not Baloch moved to Baluchistan heightening insecurity among the local population<sup>99</sup>. These problems are causing social and political threats to the country.

Beside floods and unexpected rainfall, the rising temperature also contributes to food insecurity further worsening peace and stability in Pakistan. Climate change can cause influential problems for Pakistan, if left unaddressed. Severe security risks in the social, political, economic, and geographic spheres might result from it. Pakistan's vulnerability to climate change and global warming increased from 10th to seventh position in the Climate Risk Index of 2016<sup>100</sup>.

For Pakistan, being an agricultural country, there is a direct relation between climate change and the economy. With most residents involved in agriculture and related sectors, climate change directly impacts them disproportionately resulting in mass migration from rural to urban areas in search of employment and resources.

During catastrophes and disasters, there is a direct correlation between the middle class and lower middle class and decreased crime rates due to climate change. These elements provide

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<sup>97</sup> Sampedro.

<sup>98</sup> Luis Miguel Fonseca, José Pedro Domingues, and Alina Mihaela Dima, "Mapping the Sustainable Development Goals Relationships," *Sustainability (Switzerland)* 12, no. 8 (2020), <https://doi.org/10.3390/SU12083359>.

<sup>99</sup> Sampedro, "The Sustainable Development Goals (SDG)."

<sup>100</sup> Fonseca, Domingues, and Dima, "Mapping the Sustainable Development Goals Relationships."

non-traditional security difficulties that have the potential to reduce the state's capabilities and greatly raise security risks at the societal level <sup>101</sup>. The relationship between climate change and increased crime in Pakistan is multifaceted, involving factors such as extreme weather events, environmental degradation, and resource scarcity <sup>102</sup>. Climate change exacerbates vulnerabilities in communities, potentially leading to social and economic challenges that contribute to higher crime rates. Environmental crimes, including illegal waste dumping, wildlife trade, and deforestation, have become prevalent in Pakistan, posing threats to both the environment and human security <sup>103</sup>. Climate-induced migration, coupled with overpopulation and resource depletion, can trigger conflicts over land and resources, especially in areas experiencing environmental shifts <sup>104</sup>. Additionally, factors like scorching heat, financial crises, water scarcity, and competition over limited resources, worsened by climate change, can significantly escalate the likelihood of conflicts and crimes <sup>105</sup>. The depletion of forests due to climate change intensifies environmental degradation and illegal logging activities, undermining conservation efforts <sup>106</sup>. Water scarcity exacerbated by climate change leads to disputes over water resources and instances of water theft, further exacerbating tensions <sup>107</sup>. Climate-induced habitat loss also contributes to the illegal poaching and trafficking of wildlife species, endangering biodiversity <sup>108</sup>. Moreover, climate-induced disasters like floods and droughts force communities to migrate, leading to disputes over land and instances of land grabbing, escalating social tensions <sup>109</sup>. Pollution-related offenses such as illegal waste

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<sup>101</sup> Hima Bindu Kota et al., "Sustainable Development Goals and Businesses," *Australasian Accounting, Business and Finance Journal* 15, no. 5 Special Issue (2021), <https://doi.org/10.14453/aabfj.v15i5.1>.

<sup>102</sup> United Nations Office on Drugs and Crime (UNODC), "Climate Change, Trafficking in Persons and Smuggling of Migrants," 2022, [https://www.unodc.org/documents/human-trafficking/GLO-ACTII/UNODC\\_Climate-TIP-SOM\\_Policy\\_Paper.pdf](https://www.unodc.org/documents/human-trafficking/GLO-ACTII/UNODC_Climate-TIP-SOM_Policy_Paper.pdf).

<sup>103</sup> Faizan Ali et al., "Climate Change-Induced Conflicts in Pakistan: From National to Individual Level," *Earth Systems and Environment* 2 (2018): 573–99.

<sup>104</sup> Nidhi Nagabhatla et al., "Water and Migration: A Global Overview," *UNU-INWEH Report Series* 10 (2020).

<sup>105</sup> Ali et al., "Climate Change-Induced Conflicts in Pakistan: From National to Individual Level."

<sup>106</sup> Khalid et al., "Deforestation Dynamics in Pakistan: A Critical Review: Deforestation Dynamics."

<sup>107</sup> Mamoon Masud and Suleman Mazhar, "Development of a Low-Cost Autonomous Underwater Vehicle for Irrigation Canal Monitoring," in *International Conference on Offshore Mechanics and Arctic Engineering*, vol. 58837, 2019, V006T05A031.

<sup>108</sup> Asad Ullah et al., "Climatic Changes and Their Effect on Wildlife of District Dir Lower, Khyber Pakhtunkhwa, Pakistan," *Journal of Atmospheric Science Research* 3, no. 4 (2020): 38–43.

<sup>109</sup> Nagabhatla et al., "Water and Migration: A Global Overview."

dumping and air and water pollution are on the rise due to climate change, posing significant threats to public health and the environment <sup>110</sup>.

According to Matthew, climate change can jeopardize conventional security elements. The recurrence of droughts and floods can result in instability, manifesting as protests, political exploitation, and increased radicalization. Influential groups may exploit the dilemma of those affected and vulnerable. The Arab Spring in 2011 is a prominent example, where a price surge catalyzed public resistance, ultimately leading to the Arab Spring.

The World Bank's findings in 2021 discuss that climate change has its hard-hit impact on agriculture which is the major occupation of local people in Pakistan. So, climate change directly is causing loss of livelihood which is comparable to catastrophic events. Environment and climate changes have put many lives on stake and in need. Especially in developing and underdeveloped countries, the population is more exposed and vulnerable to these calamities because of poor economic conditions and non-cooperative administration.

#### **4.7. Conclusion**

The impacts of climate change are already being felt in Pakistan. There is a decrease in the availability of fresh water, an increase in the frequency of droughts and flooding, more unpredictable weather patterns, and a decline in biodiversity. The nation's food, energy, and water security are seriously threatened by these effects, which also raise critical survival issues. Pakistan views climate change as a non-traditional security threat because of its intricate and varied effects on national security, which are unrelated to traditional state-centric or military problems. It has an impact on Pakistan's security in a number of areas, including the human, environmental, and economic. For instance, it has affected the state's main industry for employment and revenue, which is agriculture. Over 250 million people are expected to become "climate refugees" by the middle of the century, forced to flee their homes owing to climate-related disasters such floods, droughts, storms, and famines. Climate change has resulted in widespread displacement of people. In Pakistan, the 2010 and 2023 floods have caused significant displacement, leading to urban migration and increased poverty. Climate change has

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<sup>110</sup> Ayesha Siddiqua, John N Hahladakis, and Wadha Ahmed K A Al-Attiya, "An Overview of the Environmental Pollution and Health Effects Associated with Waste Landfilling and Open Dumping," *Environmental Science and Pollution Research* 29, no. 39 (2022): 58514–36.

been linked to increased criminality, displacement, women's vulnerability, and disease in the country. For instance, the 2022 floods led to an increase in criminal activities, including the kidnapping and transportation of young girls from Sindh to Baluchistan. Climate change has exacerbated water insecurity in Pakistan, impacting the agriculture sector and posing challenges to food security. The country currently holds the 14th position among the 17 countries facing extremely high-water risk globally, as its groundwater resources are depleting, particularly crucial for water irrigation. Climate change poses a threat to Pakistan's territorial integrity and national sovereignty, as it can lead to large-scale displacement of people and create conditions conducive to the emergence of military conflicts between rival states in South Asia.

## CHAPTER 05: PAKISTAN'S STATUS TOWARDS SDG-13 (CLIMATE ACTION)

### 5.1. Sustainable Development Goals (SDGs)

The United Nations approved a set of 17 interconnected aims in 2015, which are known as the Sustainable Development Goals (SDGs). By 2030, they hope to eradicate poverty, safeguard the environment, and guarantee prosperity and peace for all. The Sustainable Development Goals, or SDGs, aim to address major problems that people confront, such as hunger and poverty. They ensure that peace is maintained and the environment is protected, all the while supporting equality for all<sup>111</sup>. The plans are interconnected since it is understood that actions taken in one area would have an impact on other areas. Social, economic, and environmental sustainability must all be balanced in development<sup>112</sup>. The main idea of SDGs is to give everyone a shared plan for making this world better and more long-lasting together. It helps countries, businesses or individuals from all parts of the world so they can work on SDGs goals. The SDGs aim to measure the most pressing issues, providing a comprehensive framework for action and measurement, and mobilizing creative, technological, and financial resources from all sectors of society to achieve the goals<sup>113</sup>.

#### 5.1.1. 17 Sustainable Development Goals (SDGs)

The 17 goals for a better future (SDGs) are a plan to stop poverty, keep our world safe and make sure everyone is happy by the year 2030. They are combined and keep a good mix of social, economic and natural sustainability<sup>114</sup>. The 17 SDGs are as follows:

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being

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<sup>111</sup> Farida Faisal, "Sustainability," *Pakistan Economic and Social Review* 55, no. 1 (2017).

<sup>112</sup> Sampedro, "The Sustainable Development Goals (SDG)."

<sup>113</sup> Nava Subramaniam et al., "Sustainable Development Goal Reporting: Contrasting Effects of Institutional and Organisational Factors," *Journal of Cleaner Production* 411 (2023), <https://doi.org/10.1016/j.jclepro.2023.137339>.

<sup>114</sup> Sampedro, "The Sustainable Development Goals (SDG)."

4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals

These goals focus on big world problems such as poverty, inequality, changes in weather patterns and damage to nature along with peace and fair treatment. They are all connected, and need to be reached them all. This helps make sure no one is left out or behind while creating a better future that lasts for everyone<sup>115</sup>.

## **5.2. Targets and Indicators for SDG 13**

The indicators demonstrate how we track progress, and the targets specify the objectives. One of the objectives for Goal 13, "Climate Action," for instance, is to move quickly

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<sup>115</sup> Kota et al., "Sustainable Development Goals and Businesses."



to mitigate the consequences of climate change. One of these indicators is counting how much greenhouse gas we emit every year. The worldwide measurement system for the SDGs was made by a combined group of experts and agencies on goal indicators. Later, this plan got accepted by the General Assembly at the United Nations. It has 169 goals and 247 measurements, with 92 about the environment. These indicators give a full plan for checking and following improvement towards the goals of each SDG.

### 5.2.1. Targets

SDG 13 (Climate Action) has following five targets <sup>116</sup>:

Target 13.1: Make all countries stronger and better able to adapt when faced with weather-related threats or natural disasters <sup>117</sup>.

Target 13.2: Include measures to combat climate change in national plans, strategies, and policies<sup>118</sup>.

Target 13.3: improve education, learning about climate change and building skills in people and groups better. It also encompasses lowering global warming, reducing its bad effects and giving early warnings when needed <sup>119</sup>.

Target 13.a: Implement the commitment made by developed-countries to the United Nations Framework Convention on Climate Change to bring in at least \$100 billion each year for climate-related issues <sup>120</sup>.

Target 13.b: Help set up ways to improve planning and managing climate change, especially focusing on women, young people and local or underprivileged communities <sup>121</sup>.

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<sup>116</sup> Joyeeta Gupta and Courtney Vegelin, "Sustainable Development Goals and Inclusive Development," *International Environmental Agreements: Politics, Law and Economics* 16, no. 3 (2016), <https://doi.org/10.1007/s10784-016-9323-z>.

<sup>117</sup> General Assembly, "Resolution Adopted by the General Assembly on 6 July 2017," in *Technical Report A/RES/71/313*, 2017.

<sup>118</sup> Assembly.

<sup>119</sup> Assembly.

<sup>120</sup> Assembly.

<sup>121</sup> Assembly.

## 5.2.2. Indicators

SDG 13 (Climate Action) has following eight indicators <sup>122</sup>:

1. Indicator 13.1.1: For every 100,000 individuals, the number of people who perished, went missing, or were directly impacted by disasters <sup>123</sup>.
2. Indicator 13.1.2: The total number of countries that have implemented national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 <sup>124</sup>.
1. Indicator 13.1.3: The percentage of local governments that, while adopting and putting into practice local solutions, adhere to national catastrophe risk reduction policies <sup>125</sup>.
4. Indicator 13.2.1: Number of nations having long-term plans, ideas, and nationally determined contributions to address climate change. The UN Framework Convention on Climate Change secretariat must also receive a report from them with these facts <sup>126</sup>.
5. Indicator 13.2.2: Annual greenhouse gas emissions <sup>127</sup>.
6. Indicator 13.3.1: Global citizenship education should be included into national education policies, curriculum, teacher preparation programs, and student assessments. Additionally, they must support the teaching of sustainable development that upholds human rights and enhances gender parity. This includes promoting awareness of these issues at all educational levels throughout the country <sup>128</sup>.
7. Indicator 13.a.1: Moving \$100 billion for Green Climate Fund <sup>129</sup>.

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<sup>122</sup> Fonseca, Domingues, and Dima, “Mapping the Sustainable Development Goals Relationships.”

<sup>123</sup> Roser Ritchie and Ortiz-Ospina Mispy, “Measuring Progress towards the Sustainable Development Goals,” *SDG-Tracker. Org, Website*, 2018, 805–14.

<sup>124</sup> Ritchie and Mispy.

<sup>125</sup> Ritchie and Mispy.

<sup>126</sup> Ritchie and Mispy.

<sup>127</sup> Ritchie and Mispy.

<sup>128</sup> Ritchie and Mispy.

<sup>129</sup> Ritchie and Mispy.

8. Indicator 13.b.1: Numerous underdeveloped nations and small island states with long-term strategies and adaption initiatives. The climate change office of the United Nations must be informed of these information <sup>130</sup>.

These objectives and metrics are designed to address various aspects of the consequences of climate change. They provide a detailed action and measurement plan.

### **5.3. Role of Targets and Indicators in Measuring Progress**

Goals and indicators are very important in knowing how well the Sustainable Development Goals (SDGs) have been reached. The goals give clear aims, and the indicators give the way to measure progress. The targets and indicators are designed to be measurable, specific, and relevant to the specific goals and objectives of each SDG.

The goals and indicators give a complete system to check progress towards the special targets of each SDG. They help governments, groups and individuals to do significant things for a better world. The goals and indicators help to find loopholes that need more focus and funds for a lasting future for everyone<sup>131</sup>.

The SDG Tracker, a project by the United Nations and World in Data, checks how much we're moving close to our goals for Sustainable Development made under a plan called SDGs. The tracker gives out information and details based on data to help people keep up with worldwide progress for making the environment better<sup>132</sup>.

Measuring progress for the goals is important, and this needs targets and indicators. They give a complete plan for actions and checking, letting decision-makers, influential groups, and people to take significant actions for a better and more sustainable future for all <sup>133</sup>.

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<sup>130</sup> Ritchie and Mispy.

<sup>131</sup> Subramaniam et al., "Sustainable Development Goal Reporting: Contrasting Effects of Institutional and Organisational Factors."

<sup>132</sup> Xiuhui and Raza, "Delving into Pakistan's Industrial Economy and Carbon Mitigation: An Effort toward Sustainable Development Goals."

<sup>133</sup> Farida Faisal and Mehr Ali Shah, "Sustainability: An Imperative For Improving Governance And Management In Pakistan," *Pakistan Economic and Social Review*, 2017.

## 5.4. Pakistan's progress

Pakistan measures its progress towards achieving the targets and indicators for SDG 13 related to climate change through various means, including the following:

1. National SDG Index: Pakistan has made a national goal index using local data sources. These are taken from real and trustworthy places. The index gives a full review of the nation's work towards reaching SDGs, including SDG 13 <sup>134</sup>.
2. SDG Support Units: Pakistan has set up help groups at the federal and state levels to watch how close they are getting to their goals in SDGs, including Goal 13.
3. National SDGs Framework: Pakistan has planned for the whole country about how to reach these SDGs. This includes reaching Goal 13 too. The plan is centered on making SDG's part of planning processes, censuring strong monitoring and reporting on SDGs, and promoting partnerships for the goals.
4. SDGs Status Report: Pakistan has released its first ever report about SDGs which gives information on 133 SDG indicators with their corresponding latest values. The report says that Pakistan's improvements on the goals for a sustainable world are "moderate" and shows how far they have come compared to 2014-2015.

### 5.4.1. Progress Towards Achieving the Targets for SDG 13

#### 5.4.1.1. Progress towards target 13.1:

Pakistan has been making great efforts to fulfill Sustainable Development Goal (SDG) 13.1. This objective is to be better equipped to deal with natural catastrophes and risks associated to climate change. In accordance with the Sendai Framework on Disaster Risk Reduction (DRR), the nation has implemented and adhered to national DRR measures. Pakistan has improved its crisis handling score from 0.4 in 2018 to 0.8 in 2020. Moreover, Pakistan has implemented climate-compatible development in government policy documents.

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<sup>134</sup> Maryam Ikram and Husaina Banu Kenayathulla, "Education Quality and Student Satisfaction Nexus Using Instructional Material, Support, Classroom Facilities, Equipment and Growth: Higher Education Perspective of Pakistan," *Frontiers in Education* 8 (2023), <https://doi.org/10.3389/feduc.2023.1140971>.

They passed their first National Climate Change Policy about fighting climate change in 2012 - showing the seriousness about this issue <sup>135</sup>. The country has made SDG support units at federal and provincial levels. They have created a National Plan, which focuses on converting the SDG Goals into planning processes while monitoring them closely to make sure that their progress is accurately reported <sup>136</sup>. Pakistan has made progress in this area, but there are still challenges to deal with. It is believed to make very little progress on SDG 13 (climate action) <sup>137</sup>. Thus, sustained efforts are required to increase Pakistan's resilience and ability for adaptation to risks related to climate change and natural disasters.

#### ***5.4.1.2 Progress towards target 13.2:***

Pakistan is striving to achieve Sustainable Development Goal (SDG) 13.2. The primary goal of this target is to include adaptation measures for climate change into national plans and strategies. Pakistan enacted its initial National Climate Change Policy in 2012. This showed how serious they are about fighting climate change <sup>138</sup>. The nation has also made and agreed on a National SDG Framework that outlines its goals to reach the SDGs, including goal 13. Also, they are making specific plans for each province linked with these same objectives. Pakistan has also set up support groups in federal and local areas to watch over progress on reaching the SDGs, including goal 13 <sup>139</sup>.

Incorporating climate change activities into national policies and plans remains a challenge for Pakistan. Six of the seven variables used to calculate SDG 13 are global indicators, according to a 2017 study by Pakistan's Federal Ministry of Planning, Development, and Reforms. The progress on climate change actions in Pakistan is considered minimal. So, it needs to keep trying hard in Pakistan so that steps against climate change can be properly put into national plans and goals.

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<sup>135</sup> Marlon E Cerf, "The Sustainable Development Goals: Contextualizing Africa's Economic and Health Landscape," *Global Challenges* 2, no. 8 (2018), <https://doi.org/10.1002/gch2.201800014>.

<sup>136</sup> Obaideen et al., "The Role of Wastewater Treatment in Achieving Sustainable Development Goals (SDGs) and Sustainability Guideline."

<sup>137</sup> Imran Khan and Karim Haider Syed, "Clean Green Pakistan Movement: A Way To Combat The Challenges Of Climate Change," *Gomal University Journal of Research* 37, no. 04 (2021), <https://doi.org/10.51380/gujr-37-04-07>.

<sup>138</sup> Judith E Krauss, "Unpacking SDG 15, Its Targets and Indicators: Tracing Ideas of Conservation," *Globalizations* 19, no. 8 (2022), <https://doi.org/10.1080/14747731.2022.2035480>.

<sup>139</sup> Shahzad et al., "Assessment of Biomass Energy Barriers towards Sustainable Development: Application of Pythagorean Fuzzy AHP."

#### ***5.4.1.3 Progress towards target 13.3:***

Pakistan is working hard to reach Goal 13.3 of the Sustainable Development Objectives (SDGs). This goal focuses on improving education regarding climate change, alerting people and helping individuals mitigate climate change by adapting ways that reduce impacts quickly. The country understands that it needs to educate people about climate change much more than before. Pakistan has included climate change education (CCE) across all levels of formal education systems, with a special emphasis on higher education <sup>140</sup>. Every facet of mitigating and responding to climate change is covered by Pakistan's National Climate Change Policy. The country realized that climate change constituted a non-traditional security danger and vowed to meet the SDGs, especially SDG 13 <sup>141</sup>. Moreover, Pakistan has created support teams at the country's central and provincial levels to monitor how well they are contributing toward SDG goals including Goal 13.

But Pakistan is still facing challenges to make education better and raise awareness about mitigating climate change. They need more resources for reaching SDG 13.3 goal, especially for early warning of natural disasters like floods and earthquakes.

#### ***5.4.1.4 Progress towards target 13.a:***

Pakistan is trying to meet its climate finance goals by teaming up with global partners, making national policies, and working together with various stakeholders. The nation emphasizes that in order to mitigate climate change, industrialized nations must provide \$100 billion annually. This was decided upon in the Paris Agreement and the United Nations Framework Convention on Climate Change (UNFCCC). Pakistan has also made the point that developing countries are being hurt harder by climate change and that they should be entitled to financial and economic support for both combating and adapting to it <sup>142</sup>. To solve climate change related issues, Pakistan needs \$340 billion in seven years, with a considerable portion of this aid allocated toward mitigating and adapting efforts.

Pakistan is trying to get support from developed countries by creating the Pakistan Climate Change Authority and making policies that help secure finances for coping with climate changes. But there are concerns about how well Pakistan speaks for itself and its

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<sup>140</sup> Faisal and Shah, "Sustainability: An Imperative For Improving Governance And Management In Pakistan."

<sup>141</sup> Faisal and Shah.

<sup>142</sup> Cerf, "The Sustainable Development Goals: Contextualizing Africa's Economic and Health Landscape."

internal laws at international level making it harder to get international climate finance <sup>143</sup>. After recognizing the importance of lower greenhouse gas emission, Pakistan is setting domestic policies to mitigate climate change such as shifting to renewable sources of energy and reducing its dependence on fossil fuels like coal or petrol. For this purpose, Pakistan has introduced wind and solar power for electricity generation. Right now, 26 private wind projects are working. They make about 1335 MW of power. Moreover, 10 wind projects with a total capacity of 510 MW have reached financial close and are being built. As of June 30, 2022, Pakistan has a total electricity generation capacity of about 43,775 megawatts. This includes thermal power which is around 26,683 MW and hydroelectric at approximately 10.6 gigawatts from dams along rivers to produce more energy for homes or businesses every year <sup>144</sup>.

Pakistan is trying to achieve climate finance targets through a variety of ways like international advocacy, domestic policy reforms, and efforts to transition towards sustainable energy sources. The country is trying to deal with problems caused by climate change. The country is seeking to address the challenges of climate change through a combination of adaptation and mitigation measures, while also emphasizing the need for developed countries to fulfill their financial commitments to support climate-vulnerable nations.

#### **5.4.1.5 Progress towards target 13.b**

Pakistan is working hard to reach Goal 13.5 in the Sustainable Development Goals (SDGs). This goal aims at making better policies and strategies for management of climate change, especially focusing on women groups like girls and young people along with small communities who often need more help or attention <sup>145</sup>. Some of the efforts made by Pakistan in this regard include:

1. Education and Awareness-raising: Pakistan knows the importance of education and awareness in mitigating climate change impacts, therefore. For this purpose, Pakistan has

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<sup>143</sup> Zarrabeitia-Bilbao et al., “World Environment Day: Understanding Environmental Programs Impact on Society Using Twitter Data Mining.”

<sup>144</sup> Muhammad Daud Khan et al., “Monitoring of Afforestation Activities Using Landsat-8 Temporal Images, Billion Trees Afforestation Project, Pakistan,” *Nova Mehanizacija Sumarstva* 42, no. 1 (2021), <https://doi.org/10.5552/nms.2021.3>.

<sup>145</sup> World Health Organization, “Health Indicators of Sustainable Cities,” *The Rio+20 UN Conference on Sustainable Development*, no. May (2012).

included climate change education (CCE) across all levels of formal education systems, with a special emphasis on higher education<sup>146</sup>

2. Climate Change Adaptation and Resilience: Pakistan's revised Nationally Determined Contributions (NDC) emphasize the loss and damage component and take a more comprehensive approach to adaptation, addressing demands in several sectors. The NDC's areas of resilience and adaptation include waste management, water, forestry, health, agriculture, biodiversity and ecosystems, and disaster risk reduction<sup>147</sup>.

3. International Collaboration: Pakistan is working with partners like the United Nations to combat the effects of climate change. The nation convened a meeting in January 2023 with other nations to talk about the suffering and devastation caused by climate change-related catastrophes like earthquakes and floods and to request immediate cooperation for the creation of a recovery and reconstruction plan<sup>148</sup>.

Although these efforts show Pakistan's dedication to reach Goal 13.5, more finances and efforts are needed in capacity building and creating awareness among people.

## **5.5. Pakistan's SDG Status Report**

Pakistan is 128th out of 166 countries in the Sustainable Development Report 2023 with an overall score of 58.97. This ranking is based on the nation's progress to reach all 17 goals for Sustainable Development (SDGs). The report reflects how well all 193 United Nations member countries are doing. Pakistan's position shows where it stands now with the SDG goals. In reference to The Sustainable Development Report, Pakistan's ranking went up from 129th place out of 163 countries in 2021 to being ranked as 128 among 166 countries in 2023<sup>149</sup>. The country is still challenging itself to reach the SDG targets with an annual

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<sup>146</sup> Waqas Ahmed et al., "Assessing and Prioritizing the Climate Change Policy Objectives for Sustainable Development in Pakistan," *Symmetry* 12, no. 8 (2020), <https://doi.org/10.3390/SYM12081203>.

<sup>147</sup> Abdul Waheed et al., "Disaster Management and Environmental Policy Integration in Pakistan — an Evaluation with Particular Reference to the China–Pakistan Economic Corridor Plan," *Environmental Science and Pollution Research* 30, no. 48 (2023), <https://doi.org/10.1007/s11356-023-29310-1>.

<sup>148</sup> Arshad Ali and M Jawed Iqbal, "National Disaster Management Act, 2010 of Pakistan: A Review," *Journal of Disaster and Emergency Research*, 2021, <https://doi.org/10.18502/jder.5810>.

<sup>149</sup> Rabiya Mukhtar, "Review of National Multi-Hazard Early Warning System Plan of Pakistan in Context with Sendai Framework for Disaster Risk Reduction," in *Procedia Engineering*, vol. 212, 2018, <https://doi.org/10.1016/j.proeng.2018.01.027>.



financing gap of US\$3.72 billion for 2020-2030. The report also points out that Pakistan's government systems still have structural problems including procedural, legal, capacity, and resource constraints.

About 30.9% of Pakistan's SDG targets have been met or are on pace. 41.2% have made just minimal progress, and 27.9% have gotten worse in terms of the goals' development. Pakistan is on pace to sustain SDG successes for just two objectives, according to the SDG dashboard: responsible consumption and production (SDG 12) and quality education (SDG 4)<sup>150</sup>. The report stresses the need for strong and renewed political will, commitment, and availability of resources to make the SDGs goals a reality for the people of Pakistan.

Pakistan has shown minimal improvement in SDG 13 (Climate Action) over the last three years. While the country has made progress in some areas. Despite this achievement, there are concerns about the efficacy of the country's efforts in curbing emissions and addressing climate change. Therefore, while Pakistan has made some strides in climate action, there are still challenges that need to be addressed to make a more significant impact on SDG 13<sup>151</sup>.

## 5.6. Conclusion

The United Nations adopted the Sustainable Development Goals (SDGs), a collection of 17 internationally acknowledged goals, in 2015. These development plans sought to end poverty, save the environment, and ensure everyone's prosperity by 2030. SDG 13 in particular discusses the issues of climate actions and some targets like enhancing resilience to climate-related hazards, incorporating initiatives against climatic change into governing strategies, increasing education concerning these issues.

Pakistan has been committed to mitigate climate change through initiatives such as cooperation with the United Nations and other partners internationally. The nation is making an effort to raise public awareness of climate concerns, incorporate climate change initiatives

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<sup>150</sup> Aisha Azhar, Muhammad Nasir Malik, and Asif Muzaffar, "Social Network Analysis of Army Public School Shootings: Need for a Unified Man-Made Disaster Management in Pakistan," *International Journal of Disaster Risk Reduction* 34 (2019), <https://doi.org/10.1016/j.ijdr.2018.11.024>.

<sup>151</sup> Munich Personal et al., "Natural Hazards and Disaster Management in Pakistan," *Journal of Disasters and Environment* 5, no. 4 (2010).

into national policies, and secure funding for climate-related environmental initiatives. Right now, Pakistan is facing challenges to achieve SDGs such as administrative and structural issues within its government systems and an annual financing gap that is significant. Pakistan has achieved some milestones in mitigating climate change and striving towards achievement of SDG targets there is still a lot to be done especially when it comes to challenges and financial gaps. Continued dedication, increased resources, and renewed political commitment will be vital to realizing the SDG goals including those pertaining to climate action.

## **CHAPTER 6: ASSESSMENT OF EXISTING POLICIES AND STRATEGIES IN PAKISTAN TO MITIGATE CLIMATE-INDUCED ENVIRONMENTAL SECURITY CHALLENGES.**

Pakistan, despite its small contribution to global greenhouse gas emissions, is among the ten worst climate-affected countries in the world. The nation has made environmental preservation and climate change a priority in its yearly budgets, long-term planning, and related public sector development initiatives. At both the national and subnational levels, specific financial resources have been set aside for the implementation of the Framework for Implementation of the Climate Change Policy<sup>152</sup>. Pakistan is well acknowledged to be vulnerable to the negative effects of climate change. The negative effects of climate change are already here and will only become worse<sup>153</sup>. Pakistan is dealing with problems caused by climate, and they have made some plans to lessen these issues. Some of the key policies and strategies include:

### **6.1. National Climate Change Policy (NCCP)**

After the Paris Climate Agreement in 2015, Pakistan changed its policies and strategies. They updated their focus on two things: adapting to climate change and mitigating it via nature-based solutions<sup>154</sup>.

#### **6.1.1. The National Climate Change Policy (NCCP) Objectives**

The Pakistan National Climate Change Policy (NCCP) aims to handle climate change challenges and guide the country in a way that is climate-resilient and low in greenhouse gas emissions. The policy has made some goals to make sure that the policy stays efficient and

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<sup>152</sup> Maroof Mittha, "Renewable Energy Policy in Pakistan: A Critique," n.d.

<sup>153</sup> Jumaina Siddiqui, "Pakistan's Climate Challenges Pose a National Security Emergency," *United States Institute of Peace*, Jul, 2022.

<sup>154</sup> Pomi Shahbaz et al., "Adoption of Climate Smart Agricultural Practices through Women Involvement in Decision Making Process: Exploring the Role of Empowerment and Innovativeness," *Agriculture (Switzerland)* 12, no. 8 (2022), <https://doi.org/10.3390/agriculture12081161>.

effective. These goals help the country to achieve the targets of Sustainable Development especially SDG 13. Some of the key objectives of the NCCP include <sup>155</sup>:

1. **Institutional Capacity Building:** The NCCP aims to strengthen the institutional capacity for climate change governance, to ensure that the right steps and processes are put in place to implement climate change policies into action and monitor how they're working right.
2. **Water Security:** Achieving water security is a significant goal of the NCCP. They know how important it is to manage water efficiently, especially when climate changes keep happening. To address water security challenges, NCCP also focuses on policies to mitigate its potential impact on various sectors, including agriculture and industry.
3. **Integration of National Policies:** The NCCP also focuses on incorporating climate change considerations to national strategies across different sectors, so there's a unified and planned way to deal with problems caused by climate change and global warming.
4. **Natural Resource Management:** The NCCP aims to manage nature's resources in a sustainable way in order to lessen the impact of climate change on biodiversity and ecosystem. NCCP focuses on the need to mitigate these impacts through effective management practices.
5. **Natural Disaster Management:** Since natural disasters caused by climate change are happening more frequently and with greater strength, the NCCP makes sure to prioritize effective disaster management to protect lives and infrastructure.
6. **Social Sector Development:** The policy understands that making social sectors stronger helps build resilience against climate change. This can be done by improving health, supporting jobs and promoting the well-being of the community <sup>156</sup>.
7. **Environmental Financial Structure Development:** The NCCP aims to develop and promote financial systems that are environmentally friendly and support climate change adaptation and mitigation, making sure the availability of all resources for effective implementation.

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<sup>155</sup> Shamsheer ul Haq et al., "Looking up and Going down: Does Sustainable Adaptation to Climate Change Ensure Dietary Diversity and Food Security among Rural Communities or Vice Versa?," *Frontiers in Sustainable Food Systems* 7 (2023), <https://doi.org/10.3389/fsufs.2023.1142826>.

<sup>156</sup> Iqra Mohiuddin et al., "Scale and Drivers of Female Agricultural Labor: Evidence from Pakistan," *Sustainability (Switzerland)* 12, no. 16 (2020), <https://doi.org/10.3390/su12166633>.

These goals are meant to solve the problems caused by changes in climate and make sure that Pakistan handles future climate changes through a comprehensive and coordinated approach. By prioritizing these objectives, the NCCP aims to achieve sustainable climate and development goals, ultimately contributing to the country's resilience in climate change <sup>157</sup>.

## **6.2. Climate Change Task Force**

The Planning Commission of Pakistan established the 'Task Force on Climate Change' (TFCC) in October 2008. The purpose of this task force was to offer suitable directives to safeguard essential resources crucial to the country, including food, water, and energy <sup>158</sup>.

### **6.2.1. Objectives of Climate Change Task Force**

1. The Climate Change Task Force aims to address climate change on time and to ensure enough funds are allocated to deal with its impacts <sup>159</sup>.
2. The Task Force aims to lead from the front in the implementation of Pakistan's National Determined Contributions under the Paris Agreement.
3. The group focuses on making plans, policies, strategies and processes to deal with Pakistan's climate change challenges.

## **6.3. National Command and Operation Center (NCOC)**

The National Command and Operation Center served as the blueprint for Pakistan's COVID-19 response (NCOC). A climate-focused NCOC might oversee Pakistan's National Determined Contributions under the Paris Agreement's implementation and ensure that adequate funding is put aside to address the consequences of climate change <sup>160</sup>. To do this,

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<sup>157</sup> Kaleem Anwar Mir et al., "Co-Benefits of Air Pollution Control and Climate Change Mitigation Strategies in Pakistan," *Environmental Science and Policy* 133 (2022), <https://doi.org/10.1016/j.envsci.2022.03.008>.

<sup>158</sup> Golam Rasul et al., "Beyond Hydropower: Towards an Integrated Solution for Water, Energy and Food Security in South Asia," *International Journal of Water Resources Development* 37, no. 3 (2021): 466–90.

<sup>159</sup> Paul D Williams and Matt McDonald, "An Introduction to Security Studies," in *Security Studies*, 2018, <https://doi.org/10.4324/9781315228358-1>.

<sup>160</sup> Benjamin Zala, "Contemporary Security Studies," *Medicine, Conflict and Survival* 26, no. 4 (2010), <https://doi.org/10.1080/13623699.2010.535393>.

pertinent national and provincial organizations would need to collaborate in order to create a shared framework for interprovincial cooperation. According to the US Institute of Peace, an NCOC with a climate change focus may ensure the establishment of a robust interprovincial coordination framework and lead Pakistan's National Determined Contributions implementation under the Paris Agreement <sup>161</sup>. The NCOC model is a whole-of-government approach that could be used to tackle the climate crisis head-on.

### **6.3.1. Objectives of National Command and Operation Center (NCOC)**

The National Command and Operation Center (NCOC) in Pakistan efficiently handled COVID-19 pandemic. Similarly, the Climate NCOC could be just as helpful to make sure we have sufficient resources allocated to address the impacts of climate change <sup>162</sup>.

1. **Interprovincial Coordination:** Under the Paris Agreement, Pakistan's National Determined Contributions would be implemented under the direction of the Climate NCOC. To this end, NCOC mandates that national and provincial authorities collaborate to develop a coordinated climate change mitigation action plan.
2. **Whole-of-Government Approach:** Using both the strengths and weaknesses of the model, the Climate NCOC would work with all branches of government to address the consequences of climate change in Pakistan.
3. **Resource Allocation:** The Climate NCOC would ensure that adequate resources are available to address climate change-related challenges, manage its repercussions, and advance sustainable development.
4. **Addressing Climate-Induced Security Challenges:** The Climate NCOC will handle threats to security caused by climate in Pakistan via coordination between different stakeholders and ensuring an efficient system for interprovincial coordination <sup>163</sup>.

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<sup>161</sup> Siddiqui, "Pakistan's Climate Challenges Pose a National Security Emergency."

<sup>162</sup> Mely Caballero-Anthony, *An Introduction to Non-Traditional Security Studies: A Transnational Approach*, An Introduction to Non-Traditional Security Studies: A Transnational Approach, 2018, <https://doi.org/10.4135/9781473972308>.

<sup>163</sup> Hollianne Marshall, "Book Review: An Introduction to Non-Traditional Security Studies: A Transnational Approach," *International Review of Victimology* 24, no. 3 (2018), <https://doi.org/10.1177/0269758018762632>.

## **6.4. Empowering Pakistan's Youth**

It is essential to help Pakistani young adjust to climate change. This is because people will find it harder to deal with the consequences of climate change and global warming as they become more intense over time. The government must work hard to mitigate the consequences of climate change, emphasize that it poses an existential threat to Pakistan, avoid politicizing the issue, and take a public-facing stance <sup>164</sup>.

### **6.4.1. Objectives of Empowering Pakistan's Youth**

Objectives of empowering Pakistan's youth concerning climate change include:

1. **Youth-Led Climate Adaptation Initiatives:** By strengthening youth against climate change, Pakistan can make itself a safer and stronger home for all. At the same time, it would lead low-income countries in projects that help youth adapt better to climate related changes.
2. **Youth Engagement in Policy Implementation:** Young leaders in Pakistan want their ideas to be listened to, instead of assumptions made by the government about what they need. Decision-makers and policy makers need to bring in professionals with experience, leaders from community groups, and voices of young people when putting policies into action.
3. **Improved Coordination and Collaboration:** Better cooperation between federal and state governments is needed to intensify the feelings of economic deprivation and loss. It is important for Pakistan to help young people become leaders of the future on climate change. Otherwise, progress will slow down and eventually stop <sup>165</sup>.
4. **Bottom-Up Approaches and Cross-Sectoral Collaboration:** Bottom-up approaches are essential, and youth-led methods are more likely to be successful because they are more responsive to the needs. Cross-sectoral collaboration is necessary to address critical issues like climate change, and the role of youth in addressing these challenges must be reflected in.

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<sup>164</sup> Mike Coliandris, "Book Review: An Introduction to Non-Traditional Security Studies: A Transnational Approach," *The Police Journal: Theory, Practice and Principles* 89, no. 1 (2016), <https://doi.org/10.1177/0032258x16638644>.

<sup>165</sup> Mubeen Adnan, "Pakistan's Crisis Management: Examining Proactive and Reactive Strategies Mubeen Adnan\*," *Journal of Political Studies* 21 (2014).

These objectives focus on the need to involve and encourage young people in battling climate change and developing sustainable solutions for it <sup>166</sup>.

## 6.5. Nature-Based Solutions Implemented by GOP

The issues posed by climate change are being addressed by the Government of Pakistan (GoP) through the implementation of nature-based solutions. Natural and marine ecosystems are protected, restored, or managed as part of nature-based solutions in order to offer a variety of advantages, such as food production, carbon sequestration, risk management for flooding and coastal erosion, marine energy from renewable sources, recreation, tourism, psychological healing, and a connection to the natural world. In order to promote nature-based solutions, the GoP has given the Ministry of Climate Change around 10 billion rupees under the national budget for 2022–2023. One example of this is the collaboration between Niger State and Blue Carbon to plant one billion trees in an effort to improve carbon sequestration efforts. To organize Pakistan's response to climate change and guarantee the execution of Pakistan's National Determined Contributions under the Paris Agreement, a climate-focused National Command and Operation Center (NCOC) must be established. Pakistan is using many nature-based solutions to boost climate strength. Some include:

**National Adaptation Plan:** The National Adaptation Plan (NAP) deals with urban resilience by mainstreaming climate adaptation, making land regulations better, land-use planning, enhancing climate-smart municipal services, and leveraging nature-based solutions.

**Ecosystem Restoration Initiative:** Pakistan's Ecosystem Restoration Initiative aims to restore 30% of damaged forests in Pakistan and 5% of degraded cropland.

**Protected Areas Initiative:** The Protected Areas Initiative aims to get 15% of Pakistan's land under protection by 2023. By doing so, they will create new national parks covering 7,300 square kilometers <sup>167</sup>.

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<sup>166</sup> Ali and Iqbal, “National Disaster Management Act, 2010 of Pakistan: A Review.”

<sup>167</sup> Mukhtar, “Review of National Multi-Hazard Early Warning System Plan of Pakistan in Context with Sendai Framework for Disaster Risk Reduction.”



**Promoting Climate-Smart Agriculture:** Pakistan promotes climate-smart and regenerative agriculture and livestock systems. These methods will increase income and improve food and water security.

## **6.6. Renewable Energy Solutions Implemented by GoP**

Pakistan uses a lot of fossil fuels like natural gas, oil and coal which make up 85% of its energy use. However, the country is showing more interest in renewable energy. In 2019 it had a share of renewables at 11 percent — higher than other countries in the Middle East, North Africa, Afghanistan, and Pakistan (MENAP) region. This puts Pakistan on track with the global average for renewable energy utilization <sup>168</sup>.

Like other areas, Pakistan thinks renewable energy is very important for climate change mitigation strategies. Therefore, they plan to make 60% of their total power come from renewables by the year 2030. To achieve this goal, the country plans to use its hydropower potential, estimated at 60,000 MW, with only 12 percent currently developed to achieve this goal. In 2020, the country made a commitment to stop building new coal plants except those already in progress with the complete ban on imported coal.

Pakistan is also working on coal gasification and liquefaction techniques to use its indigenous coal resources. These measures represent a strategic shift towards a more sustainable and diversified energy portfolio in Pakistan <sup>169</sup>.

## **6.7. Other Solutions**

1. Promoting electric vehicles: Pakistan aims to increase the use of electric vehicles (EVs) by making sure that 3 out of every ten vehicles will be powered by electricity until 2030.

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<sup>168</sup> Ryoma Kayano et al., “WHO Thematic Platform for Health Emergency and Disaster Risk Management Research Network (TPRN): Report of the Kobe Expert Meeting,” *International Journal of Environmental Research and Public Health*, 2019, <https://doi.org/10.3390/ijerph16071232>.

<sup>169</sup> Virginia Murray, “Science and Technology Commitment to the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030,” 2021, [https://doi.org/10.1007/978-981-15-8662-0\\_4](https://doi.org/10.1007/978-981-15-8662-0_4).

By 2025, the government plans to include over 100,000 electric automobiles, buses, and trucks into the transportation network in addition to 500,000 electric bikes and rickshaw <sup>170</sup>.

2. Leveraging market-based climate policy instruments: Pakistan is employing market-based climate policy instruments to carry out low-carbon investments and economical emission reduction plans. In collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) and the Institute for Global Environmental Strategies (GES), the government conducted an analysis of carbon pricing and emission trading systems (ETS) in the power and industrial sectors. Additionally, a National Committee on the Establishment of Carbon Markets was established towards the end of 2019 to develop recommendations for the development of a national emissions trading system and a credit-based trading mechanism that is linked to international carbon markets. This indicates Pakistan's commitment to using long-term, market-driven strategies to address climate change <sup>171</sup>.

## **6.8. Climate resilience projects**

Several successful climate resilience projects in Pakistani cities have implemented nature-based solutions. Some examples include:

### **6.8.1. Ten Billion Tree Tsunami**

This project aims to restore Pakistan's degraded ecosystems and tackle emissions by putting 10 billion trees across the country. The project is considered as a significant step toward climate resilience and is appreciated at national and international levels <sup>172</sup>.

#### ***6.8.1.1. Evaluation of Project***

The success claims of the TBTP (Tree Billion Tree Tsunami Program) relies heavily on quantitative assessments and visual presentations. The Ministry of Climate Change (MOCC) says that, after careful checking, the TBTP has made significant progress in plantation, enclosure establishment, and jobs creation. The MOCC's yearbook for 2020-21

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<sup>170</sup> Murray.

<sup>171</sup> United Nations Climate Change Secretariat, "Opportunities and Options for Integrating Climate Change Adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015 – 2030," *Technical Paper*, 2017.

<sup>172</sup> Secretariat.

states that they planted over a billion trees, reforested more than four hundred and eighty thousand hectares of land, and employed one lakh sixty-four thousand workers between 2019 and 2021.

The MOCC cites a preliminary assessment report by the IUCN, WWF, and FAO consortium, which allegedly indicated a high plant survival rate of 70–90%. However, due to the unavailability of the preliminary report to the public, it remains challenging to assess the validity of this claim independently <sup>173</sup>.

### **6.8.1.2 Success of Project**

The Ten Billion Tree Tsunami project in Pakistan has made significant progress in achieving its goals, as evidenced by the following statistics and findings:

1. **Revive Forest and Wildlife Resources:** The planted trees have a survival rate of 70-90% of the one billion trees so far all over the country <sup>174</sup>. This high survival rate shows that efforts to restore forests and wildlife are successful.
2. **Encourage Eco-tourism and Community Engagement:** The project has generated environmental, economic, and social impacts. It's been called a 'Green Success' by the World Economic Forum. It has also made 13,000 private nurseries and involved local people in keeping nature safe <sup>175</sup>.
3. **Job Creation:** The project made 500,000 jobs with the Billion Tree Tsunami program. The Tree Tsunami Plantation project has also helped to make small 'eco-business' owners and create more jobs <sup>176</sup>.

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<sup>173</sup> Amina Aitsi-Selmi et al., “Reflections on a Science and Technology Agenda for 21st Century Disaster Risk Reduction: Based on the Scientific Content of the 2016 UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–20,” *International Journal of Disaster Risk Science* 7, no. 1 (2016), <https://doi.org/10.1007/s13753-016-0081-x>.

<sup>174</sup> Amina Aitsi-Selmi and Virginia Murray, “Protecting the Health and Well-Being of Populations from Disasters: Health and Health Care in the Sendai Framework for Disaster Risk Reduction 2015-2030,” *Prehospital and Disaster Medicine* 31, no. 1 (2015), <https://doi.org/10.1017/S1049023X15005531>.

<sup>175</sup> Aitsi-Selmi and Murray.

<sup>176</sup> Hsiang Chieh Lee and Hongey Chen, “Implementing the Sendai Framework for Disaster Risk Reduction 2015–2030: Disaster Governance Strategies for Persons with Disabilities in Taiwan,” *International Journal of Disaster Risk Reduction* 41 (2019), <https://doi.org/10.1016/j.ijdrr.2019.101284>.

4. **Reduce Carbon Dioxide Emissions:** The project has taken in 0.04 billion tons of CO<sub>2</sub> by the year, giving an estimated money advantage of \$120 million. A study by the International Union for Conservation of Nature (IUCN) says that Pakistan's Ten Billion Tree Tsunami project has caught 0.04 Gigatons of CO<sub>2</sub> until now in 2020 and is expected to bring about \$12 billion. This shows that the project has done a good job in lowering carbon dioxide emissions. A study in Faisalabad district found that the project has helped decrease air pollution and make the environment better. The research also showed that the project has aided in raising how much carbon storage is possible there. Moreover, the project has been called a 'Green Success' by the World Economic Forum <sup>177</sup>.

The success of the project in cutting down carbon dioxide is also estimated by the fact that Pakistan ranks at seventh position regarding growth in forest areas <sup>178</sup>. The country has grown its forest area by 5.1% from 2015 to 2020. This growth in forest area is because of the Ten Billion Tree project and other tree planting programs across the country. Even though the project ended in 2023, numbers and stories show that the Ten Billion Tree Tsunami was successful.

### **6.8.2. Clean Green Pakistan Index**

The Clean Green Pakistan Movement aims to educate people about cleanliness and dealing with climate change through the Clean Green Pakistan Index (CGPI). More than 35 sub-indicators related to plantations, overall cleanliness, solid waste management, liquid waste management, and safe drinking water are used by the CGPI <sup>179</sup>. The CGPI aims to develop a competitive environment in the neighborhood for a clean, green Pakistan. CGPI's goals are to make communities stronger and more aware about cleanliness and climate change, ensure the voices and participation of the people as an integral part of Clean Green Pakistan. It empowers local councils to look over their cities and assess if they meet certain targets of CGPI or not <sup>180</sup>.

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<sup>177</sup> Lee and Chen.

<sup>178</sup> Boyi Li et al., "An Earth Observation Framework in Service of the Sendai Framework for Disaster Risk Reduction 2015–2030," *ISPRS International Journal of Geo-Information* 12, no. 6 (2023), <https://doi.org/10.3390/ijgi12060232>.

<sup>179</sup> Khan and Syed, "Clean Green Pakistan Movement: A Way To Combat The Challenges Of Climate Change."

<sup>180</sup> "Sendai Framework for Disaster Risk Reduction 2015-2030," *Australian Journal of Emergency Management* 30, no. 3 (2015).

### **6.8.2.1. Evaluation of the Project**

The first phase of CGPI began in November 2019 and ended in June 2020. Attock ranked first in the first round, preceded by Bahawalpur, Lahore, Gujrat, and Rawalpindi. In solid waste management, Bahawalpur ranked highest with Attock outperforming in plantation. Lahore stood best in provision of clean drinking water and maintaining healthy hygienic practices. Faisalabad scored highest on sanitation and clean streets. Sahiwal, Gujranwala, and Swat secured innovation awards.

Since the project started, over 115,000 Clean Green Champions have recorded their clean green actions on the government's official portal. The CGPI aims to rank cities/towns by how clean and green they are with the help of government, community groups and businesses at central and provincial level. The healthy change in behavior is an integral part of CGPI plan to make a secure and sustainable Pakistan. The goal of CGPI is to make communities aware regarding cleanliness and climate change. It also ensures that residents engage in activities for a Clean Green Pakistan, empowers local councils to track progress using specific indicators and creates a competitive environment among the towns and neighborhoods for sustainable clean green Pakistan <sup>181</sup>.

### **6.8.3. Ecosystem Restoration Initiative**

This initiative aims to restore 30% of Pakistan's degraded forest and 5% of ruined farmland. It includes the Protected Areas Initiative, which plans to protect 15% of Pakistan's land by 2023. This would result in the creation of 15 new national parks with a combined land size of over 7,300 square kilometers <sup>182</sup>.

Pakistan's Ecosystem Restoration Project is a component of the nation's initiatives to prevent climate change and rebuild damaged natural regions. Prior to establishing new regulations, the plan (2019–2030) seeks to bring about changes through initiatives that rescue various species of wildlife, preserve the environment, and restore harmed ecosystems. By 2030, the goal is to repair 30% of degraded wetlands, 5% of damaged farmland, 6% of degraded grassland (rangeland), and 5% of degraded wood.

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<sup>181</sup> Li et al., “An Earth Observation Framework in Service of the Sendai Framework for Disaster Risk Reduction 2015–2030.”

<sup>182</sup> Khan et al., “Monitoring of Afforestation Activities Using Landsat-8 Temporal Images, Billion Trees Afforestation Project, Pakistan.”

Pakistan's Ecosystem Restoration Initiative is closely aligned with the global UN Decade on Ecosystem Restoration (2021-2030). It needs collaboration among government agencies, civil society, and local communities. For example, WWF-Pakistan is focusing on getting communities involved to look after nature and engaging government agencies to co-manage protected areas. WWF-Pakistan has planted over 1.6 million trees in different projects and started programs to help training for skills and support equality between genders.

#### ***6.8.3.1. Evaluation of the Project***

Pakistan has performed admirably in the project to restore ecosystems. Between 2019 and December 2021, the Ten Billion Tree Tsunami initiative planted 1.42 billion trees on 1.36 million acres at over 10,000 sites. The initiative aims to revitalize Pakistan's wildlife and forests. In order to encourage and support Pakistan's growth in line with climate change, the plan also calls for the creation of the Ecosystem Restoration Fund—an impartial, open, and all-encompassing funding mechanism. Pakistan's Ecosystem Restoration Initiative is closely aligned with the global UN Decade on Ecosystem Restoration (2021-2030) and involves collaboration among government agencies, civil society, and local communities.

#### **6.8.4. Climate Resilient Urban Development and Green Building Code**

By promoting green building techniques and sustainable urban development, these programs hope to increase cities' resilience to the effects of climate change. These natural remedies have proved highly beneficial in treating the problems caused by climate change, strengthening Pakistan's climatic resilience, and raising urban dwellers' standard of living in general <sup>183</sup>.

The Climate Resilient Urban Development and Green Building Code project in Pakistan has many aims. In order to help the nation achieve its targets and goals for the Sustainable Development Goals (SDGs), good health and well-being, clean water and sanitation, affordable and clean energy, sustainable cities and communities, climate action, life on land, and responsible consumption and production, one of the primary objectives is to create

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<sup>183</sup> Vittorio Tramontin, Claudia Loggia, and Martina Basciu, “Passive Design and Building Renovation in the Mediterranean Area: New Sensitive Approach for Sustainability,” *Journal of Civil Engineering and Architecture* 4, no. 36 (2010).

a Green Building Code (GBC) <sup>184</sup>. The project also aims to create climate-resilient, safe, and sustainable cities, promote green building interventions, and institutional capacity building for a climate-responsive future built environment in Pakistan <sup>185</sup>. Furthermore, Pakistan's National Climate Change Policy points out urban growth and the Green Building Code as main initiatives to handle climate change in its nation <sup>186</sup>. In simple words, this project aims to make sure urban areas can survive extreme climate change, stay green and sustainable. This helps the country fight climate change's effects better.

#### **6.8.4.1. Evaluation of the Project**

Recent success in Pakistan's Climate Resilient Urban Development and Green Building Code project includes making a technical guide for the Green Building Code. This is still under progress. This plan is a part of Pakistan's efforts to make the building and housing sector the cornerstone of its climate change responses, promoting green building interventions and sustainable development <sup>187</sup>. The project also aims to assist farmers at dealing with climate change via skill and capacity development as mentioned in the recently updated National Determined Contributions (NDC) of Pakistan. In addition, the project is working in collaboration with Pakistan Urban Development on making plans for creating sustainable urban projects that can handle climate changes and stay safe in case of disasters. These achievements show that Pakistan is dedicated to integrating climate resilience and sustainability in its urban growth and construction methods.

## **6.9. External Climate Change and Mitigation Strategies**

### **6.9.1. Climate Promise Initiative**

The Climate Promise Initiative is a project started by the “United Nations Development Program” (UNDP). It helps countries make their goals for reducing greenhouse gas emissions

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<sup>184</sup> U N Office for Disaster Risk Reduction, “Essential Four: Pursue Resilient Urban Development and Design,” *Making Cities Resilient: My City Is Getting Ready*, 2019.

<sup>185</sup> Byerly, “A Report to the IPCC on Research Connecting Human Settlements, Infrastructure, and Climate Change.”

<sup>186</sup> Organization, “Health Indicators of Sustainable Cities.”

<sup>187</sup> Zakeer Ahmed Khan Abbasi et al., “The Impact of Climate Change on Pastoral Production Systems: A Study of Climate Variability and Household Adaptation Strategies in Southern Ethiopian Rangelands,” *Climate and Development* 5, no. 1 (2014).

stronger and adapt better to changing climate. The initiative works with over 120 countries and territories, working together with more than 35 partners. It helps on putting NDCs into action. The Climate Promise Initiative is a significant contribution to the NDC Partnership and has supported over 108 countries in submitting enhanced NDCs to the “United Nations Framework Convention on Climate Change” (UNFCCC), representing close to 25% of global emissions and 84% of developing countries <sup>188</sup>.

Pakistan now faces significant problems in growth and development because of degrading environmental conditions, heightened pressure on natural resources and changes caused by climate change.

The “Global Climate Risk Index” ranks Pakistan as the 8th most vulnerable country for climate change. In the last five decades, Pakistan has faced a rise of 0.5°C temperature annually along with changes to rainfall patterns and glacial melting. The country's economy is highly susceptible to potential climate change threats, requiring comprehensive mitigation strategies.

The Climate Promise project aims to bring together local and regional stakeholders to handle problems caused by climate change. This project supports the Pakistan Government and its partners in keeping the environment sustainable and climate resilient at national and regional level. The project also extends technical assistance to governments to carry out climate change policies that comply with international conventions. Furthermore, it helps to make institutions and communities resilient through various initiatives <sup>189</sup>.

#### **6.9.1.1. Key Objectives**

1. Support the government to reach NDC goals and gather resources by improving skills at national, state, and local levels all the time.
2. Help make plans for putting NDC into action at the provincial level and find top actions needed to reach goals.

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<sup>188</sup> Yun Gao, Xiang Gao, and Xiaohua Zhang, “The 2 °C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change—From the United Nations Framework Convention on Climate Change to the Paris Agreement,” *Engineering* 3, no. 2 (2017), <https://doi.org/10.1016/J.ENG.2017.01.022>.

<sup>189</sup> Walter Leal Filho et al., “The Influence of the Corona Virus Pandemic on Sustainable Development Goal 13 and United Nations Framework Convention on Climate Change Processes,” *Frontiers in Environmental Science* 10 (2022), <https://doi.org/10.3389/fenvs.2022.784466>.



3. Assist the government to make a Climate Change Policy for Baluchistan and an Environment policy for Gilgit Baltistan.
4. Facilitate the government in making plans for measuring and tracking emissions, strategies to reduce those emissions, ideas for projects that protect nature and waste management aspects.
5. Initiate green skill development programs and career launchpads to provide opportunities for women, youth, persons with disabilities, and vulnerable groups <sup>190</sup>.

### **6.9.2. United Nations Framework Convention on Climate Change**

The “United Nations Framework Convention on Climate Change” (UNFCCC) is an international treaty adopted in 1992 at the “United Nations Conference on Environment and Development” (UNCED), informally known as the Earth Summit, held in Rio de Janeiro, Brazil. The agreement aims to balance the concentration of greenhouse gases in the air and prevent harmful changes made by human interference within climate patterns. The UNFCCC lays out the main policies and strategies for international climate action. It highlights the importance of developed countries to take a lead in greenhouse emission reduction and recognizes specific steps to be taken by developing countries in this aspect <sup>191</sup>.

With the intention of restricting greenhouse gas emissions by industrialized economies and governments, the Kyoto Protocol was approved in 1997 as an addition to the United Nations Framework Convention on Climate Change. As a party to the United Nations Framework Convention on Climate Change, Pakistan has demonstrated a strong commitment to global efforts to mitigate climate change (UNFCCC). The country has accepted the Kyoto Protocol, the Paris Agreement, and all of the Convention's annexations. Pakistan implemented the National Climate Change Policy (NCCP), which offers a thorough framework for policy goals and initiatives with a focus on adaptation. The NCCP aims to guide Pakistan in getting climate resilient while reducing carbon emissions.

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<sup>190</sup> Mizan Khan et al., “Twenty-Five Years of Adaptation Finance through a Climate Justice Lens,” *Climatic Change* 161, no. 2 (2020), <https://doi.org/10.1007/s10584-019-02563-x>.

<sup>191</sup> Godwell Nhamo and Shepherd Muchuru, “Climate Adaptation in the Public Health Sector in Africa: Evidence from United Nations Framework Convention on Climate Change National Communications,” *Jamba: Journal of Disaster Risk Studies* 11, no. 1 (2019), <https://doi.org/10.4102/JAMBA.V11I1.644>.

Currently, Pakistan is facing challenges in meeting its climate change and mitigation goals. Pakistan strictly needs to reevaluate its organizational framework required for dealing climate change and mitigation strategies for effective climate action. The country has also stressed the importance of international assistance in tackling problems caused by climate change. Pakistan also has the capacity to create domestic carbon markets and other market-based climate policy instruments. It seeks to draw in foreign contributors and investors in order to lessen the consequences of climate change and promote environmentally friendly growth. Pakistan is vulnerable to the negative effects of climate change despite its minor contribution to global greenhouse gas emissions, and its actions support the global effort to meet the UNFCCC's ultimate goals.

#### ***6.9.2.1. Pakistan's Progress and Achievements in the United Nations Framework Convention on Climate Change***

Pakistan has made significant progress and achievements in the “United Nations Framework Convention on Climate Change” (UNFCCC). Pakistan has given its updated “Nationally Determined Contribution” (NDC) to the UNFCCC. They set a "cumulative conditional target" of reducing pollution by 50% by 2030.

Pakistan is also thinking about using the tools for increased climate ambition stipulated in the Paris Agreement's Article 6, which establishes global carbon markets. The country has started many activities to improve its ability to join and benefit from world carbon markets. This will help Pakistan meet goals set out in their NDC plans and mobilize much-needed carbon finance. Pakistan's approval of the Paris Agreement has boosted UNFCCC's main goal. It also gave a clear plan with a long-term vision to achieve. Additionally, Pakistan has been working on its National Adaptation Plan (NAP) to combat climate change and reduce its vulnerability to climate risks.

#### **6.9.3. Kyoto Protocol**

A global agreement known as the Kyoto Protocol was reached in Japan on December 11, 1997, and it came into effect on February 16, 2005. The 1992 United Nations Framework Convention on Climate Change is expanded upon by this agreement. The Kyoto Protocol required countries to reduce their emissions of greenhouse gases, as there is widespread scientific agreement that these emissions are a contributing factor to global warming. Strong regulations are established by the Protocol to limit carbon emissions for 37 industrialized

nations, economies, and the European Union. The strategy takes into account the unique requirements and worries of developing nations, particularly those that are most at risk from climate change <sup>192</sup>.

The net changes in greenhouse gas emissions by sources and removals by sinks due to or directly limited to afforestation, forest restoration, and deforestation since 1990, measured as confirmed changes in carbon stocks in each commitment period, shall be used to meet the obligations under this Article of each Party, including. The accord also included three market-based methods to help countries reach their emission reduction goals, including carbon trading <sup>193</sup>.

The protocol made goals for its members to reduce greenhouse gas emission as much as possible. It should be emphasized, however, that Pakistan's only explicit responsibility under the agreement was to submit a report detailing their climate change for the years 2020–2030. It is estimated that Pakistan contributes 0.8% of the global greenhouse gas emissions, which are projected to treble by 2031. Because of the nation's long-standing reliance on imported fossil fuels, the primary producers of emissions are the energy and agricultural sectors. Although Pakistan has taken some action to lessen the consequences of climate change and adapt to them, the effectiveness of these measures is lacking. The nation created a National Climate Change Policy (NCCP) in 2012 that included a broad framework of objectives and actions for policy, with an emphasis on adaptation. But to meet the policy goals, Pakistan would need to reassess its institutional framework and concentrate on powerful action against climate change <sup>194</sup>.

Pakistan has suggested ways to improve the environment but is facing challenges in putting them into action. However, the efficacy of these measures still needs to be improved. Moreover, the economic condition of the country is making it harder for it to achieve its climate change targets. This includes putting good action plans into practice. Even with these problems, Pakistan has the potential to develop market-based climate policy tools, including a domestic

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<sup>192</sup> Nada Maamoun, “The Kyoto Protocol: Empirical Evidence of a Hidden Success,” *Journal of Environmental Economics and Management* 95 (2019), <https://doi.org/10.1016/j.jeem.2019.04.001>.

<sup>193</sup> UNFCCC, “What Is the Kyoto Protocol? | UNFCCC,” *United Nations Climate Change*, 2019.

<sup>194</sup> Muhammad Syihabuddin and Neni Ruhaeni, “Emisi Gas Rumah Kaca Berdasarkan the Kyoto Protocol of 1997 Dan Implementasinya Di Indonesia,” *Bandung Conference Series: Law Studies*, 2022.

carbon market to attract global investors who will assist in climate change and mitigation strategies and support green development <sup>195</sup>.

### ***6.9.3.1 Pakistan's Progress and Achievements in the Kyoto Protocol***

Kyoto Protocol was agreed upon in 1997 for 37 industrial nations and the European Union. It bound them to cut down on emissions of greenhouse gases. Pakistan, being a developing country, didn't have strong goals under the Kyoto Protocol. But, in Pakistan the government is also trying to lessen greenhouse emission and by sticking to Kyoto protocols that can help change local climate as it has only 3-5% of forest land <sup>196</sup>.

### **6.9.4. Paris Agreement**

The Paris Agreement, an international agreement addressing climate change, was signed in 2015 during the 21st United Nations Framework Convention on Climate Change, or COP21. The agreement's main objectives are to limit the rise in global temperatures this century and to reduce greenhouse gas emissions globally. It also covers funding, adaptation, and mitigation of climate change. The Paris Agreement is a comprehensive plan that targets every element of climate change, with measures on mitigation, adaptation, loss and damage, money, technology, capacity building, transparency, implementation and compliance, and institutions <sup>197</sup>.

The Paris Agreement creates temperature and emissions goals that compliments UNFCCC's policies and rules. The agreement aims to stop the world from getting hotter than 2°C above what it used to be. It has been promised by all major-emissions countries to reduce their climate waste, called NDCs. These promises are the foundation for world efforts to lessen greenhouse gas emissions. The accord lays forth a strategy for openly tracking, disclosing, and raising national and international climate targets. Unlike the Kyoto Protocol, which had clear lines between developed countries and developing ones, the Paris Agreement makes all parties

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<sup>195</sup> Amanda M Rosen, "The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change," *Politics and Policy* 43, no. 1 (2015), <https://doi.org/10.1111/polp.12105>.

<sup>196</sup> Rosen.

<sup>197</sup> Joanna Depledge, "The 'Top-down' Kyoto Protocol? Exploring Caricature and Misrepresentation in Literature on Global Climate Change Governance," *International Environmental Agreements: Politics, Law and Economics* 22, no. 4 (2022), <https://doi.org/10.1007/s10784-022-09580-9>.

play their part according to what they are able. This approach is called common responsibility, but different actions are based on capabilities<sup>198</sup>.

#### **6.9.4.1. Pakistan's Progress and Achievements in the Paris Agreement**

Pakistan has achieved and made strides toward the Paris Agreement. Pakistan pledged to advance gender equality upon ratifying the Paris Agreement. It has sent the “United Nations Framework Convention on Climate Change” (UNFCCC) a “Nationally Determined Contribution” (NDC) for climate change mitigation. Pakistan's ratification of the Paris Agreement has strengthened the UNFCCC's primary goal and offered a framework with a long-term outlook.

Pakistan is contemplating the utilization of the mechanisms for increased climate ambition stipulated in Article 6 of the Paris Agreement, which establishes global carbon markets. Pakistan has initiated a number of initiatives to increase its preparedness to assist in obtaining support from international carbon markets and to raise much needed carbon finance.<sup>199</sup>

It's clear that climate change can adversely affect Pakistan. The country is trying to do its part in meeting the goal set by the Paris Agreement. Pakistan's progress on the COP21 plan has been recognized, and the subsequent National Determined Contributions (NDC) will show how hard they are working to help with climate change<sup>200</sup>.

#### **6.9.5. Sendai Framework for Disaster Risk Reduction 2015-2030**

The Sendai Framework for Disaster Risk Reduction 2015–2030 is an international agreement that aims to drastically reduce, over the next fifteen years, the risk of disasters and the losses they cause to people's lives, livelihoods, and health as well as to the material, social, cultural, and environmental assets of individuals, organizations, communities, and nations<sup>201</sup>.

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<sup>198</sup> Ruo Shui Sun et al., “Is the Paris Rulebook Sufficient for Effective Implementation of Paris Agreement?,” *Advances in Climate Change Research* 13, no. 4 (2022), <https://doi.org/10.1016/j.accre.2022.05.003>.

<sup>199</sup> Gabriela Ileana Iacobuță et al., “Aligning Climate and Sustainable Development Finance through an SDG Lens. The Role of Development Assistance in Implementing the Paris Agreement,” *Global Environmental Change* 74 (2022), <https://doi.org/10.1016/j.gloenvcha.2022.102509>.

<sup>200</sup> Dann Mitchell et al., “The Myriad Challenges of the Paris Agreement,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 2018, <https://doi.org/10.1098/rsta.2018.0066>.

<sup>201</sup> “Sendai Framework for Disaster Risk Reduction 2015-2030.”

It was adopted during the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015. The plan lays out seven easy goals and four essential stages. Investing in resilience-building catastrophe reduction, enhancing readiness for effective response, and "Building Back Better" in reconstruction, rehabilitation, and recovery are a few of these <sup>202</sup>.

The new agreement known as the Sendai Framework took the place of the Hyogo Framework for Action. It is connected to other international agreements including the Paris Climate Change Agreement and the Sustainable Development Goals. It highlights how important it is to reduce the likelihood of disasters and adapt to climate change, particularly in light of the original development objectives' insufficient focus on resilience and risk reduction. The methodology, which offers a thorough approach to disaster risk management and strength-building at the local or national level, is supported by the United Nations Office for disaster Risk Reduction <sup>203</sup>.

#### **6.9.5.1. Pakistan's Progress and Achievements**

After putting the Sendai Framework for Disaster Risk Reduction (2015-2030) in place, conditions and disaster management got better in Pakistan. Some of these improvements include:

1. National Disaster Management Plan: Pakistan has made a national plan for dealing with disasters. This matches the goals and targets of the Sendai Framework which helps solve climate-related problems <sup>204</sup>.
2. Localization of Sendai Framework: The nation is making efforts to localize the Sendai framework for dealing with different climate risks and making communities more resilient.
3. Expansion of Early Warning Systems: The Sendai framework aims to develop warning systems all around the world. This will help decrease disaster risks and losses. Pakistan is

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<sup>202</sup> RobertŠakić Trogrlić et al., "Science and Technology Networks: A Helping Hand to Boost Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030?," *International Journal of Disaster Risk Science* 8, no. 1 (2017), <https://doi.org/10.1007/s13753-017-0117-x>.

<sup>203</sup> Li et al., "An Earth Observation Framework in Service of the Sendai Framework for Disaster Risk Reduction 2015–2030."

<sup>204</sup> Aitsi-Selmi et al., "Reflections on a Science and Technology Agenda for 21st Century Disaster Risk Reduction: Based on the Scientific Content of the 2016 UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–20."

focused on making its early warning systems better to lessen the effects of climate change and other natural risks <sup>205</sup>.

4. Reduction in Climate Vulnerability Index: Between 1997 and 2016, Pakistan was ranked 8th among 10 countries at climate vulnerability index, but recently due to efforts of Pakistan to deal with climate change and mitigation, it has gained a higher rank than earlier one <sup>206</sup>.

## **6.10. Effectiveness of Climate Change & Mitigation Strategies**

The recent plans to deal with climate change in Pakistan have been affected by the country's political instability, debts and economic issues, lack of energy and climate-related disasters. In Pakistan, a significant portion of population being linked with the climate vulnerable agricultural sector, its greenhouse emissions are increasing with time. The country has taken many steps to handle and adapt to climate change, like the National Climate Change Policy (NCCP) yet the effectiveness of these measures still needs to improve, and their implementation has faced challenges <sup>207</sup>.

### **6.10.1 Recent Developments**

1. National Electricity Plan: In February 2021, Pakistan announced the National Electricity Plan. This plan focuses on using different types of fuel and making better use of energy resources.

2. Enhanced Nationally Determined Contribution (NDC): In 2021, Pakistan updated and shared a new NDC. They promised to cut greenhouse gas emissions by half compared to usual business practice till 2030. This involves a guaranteed goal of cutting emissions by 15% and another contingent aim of reducing them by 35%, if help is provided by other countries.

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<sup>205</sup> Aitsi-Selmi and Murray, "Protecting the Health and Well-Being of Populations from Disasters: Health and Health Care in the Sendai Framework for Disaster Risk Reduction 2015-2030."

<sup>206</sup> Lee and Chen, "Implementing the Sendai Framework for Disaster Risk Reduction 2015–2030: Disaster Governance Strategies for Persons with Disabilities in Taiwan."

<sup>207</sup> Adnan, "Pakistan's Crisis Management: Examining Proactive and Reactive Strategies Mubeen Adnan\*."

3. Global Methane Pledge: Pakistan pledged to reduce global methane emissions by at least 30% between 2020 and 2030 when it signed the Global Methane Pledge in 2021.
4. Fast-Track Solar Photovoltaic (PV) Initiatives: Pakistan established framework rules on fast-track solar PV projects in March 2022 with the goal of replacing fossil fuel-based power capacity with around 10 GW of solar electricity<sup>208</sup>.

### **6.10.2. Challenges and Outlook**

Pakistan has problems achieving its goals on climate change, especially because of high external debt and economic issues which hinders access to loans and investments. The country's dependence on energy from fossil fuels, political problems, and a high-risk environment in the power sector have affected the implementation of climate strategies. The recent choice to increase domestic coal-burning power four times and the nation's need for China in coal projects bring additional challenge. Pakistan has tried to increase the use of renewable energy. But it has had problems with policy paralysis, high cost of capital, and lack of domestic financing.

As coal becomes financially unviable, the country's reliance on China for coal projects is getting harder. This might make it hard for Pakistan to meet its commitments to China. Pakistan must work to develop home-made renewable energy sources to draw international financial support, address the high cost and low investor interest in new coal plants, and align with its NDC commitments. The country needs a lot of assistance both physically and financially at international level to invest in people-centric climate adaptation and resilience.

In the last three years, climate change adaptation and mitigation strategies have had a significant impact on temperature and carbon emissions in Pakistan. Some key findings include:

1. Pakistan has gone beyond its lowering contributions, causing 8.7% decrease in emissions.

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<sup>208</sup> Adnan.



2. The country has given nearly 10 billion rupees (about \$50 million) to the Climate Change Ministry. This shows they are ready to deal with climate problems <sup>209</sup>.

With a focus on resilience, adaptation, and mitigation techniques, the country has been actively trying to strengthen and improve its response to climate change. Pakistan has made significant strides in implementing its National Climate Change Policy, and the country has been forced to invest extensively in climate resilience to sustain its economy and reduce poverty. As a result of the confluence of air pollution, environmental degradation, and catastrophic climate-related events, Pakistan's GDP is predicted to decline by at least 18% to 20% by 2050. This emphasizes how critical it is to act quickly to stop climate change, redirect ecologically damaging subsidies, and promote climate-smart farming and ecosystem restoration <sup>210</sup>.

The country is working hard to make progress on climate change. They are focusing their efforts mostly on mitigation, adaptation, and resilience measures. Pakistan's National Climate Change Policy has had great success, and the country is being asked to invest a lot in climate resilience to secure its economy and reduce poverty. Climate events like floods, soil pollution and air pollution will lower Pakistan's economic development by at least 18 to 20% by the year 2050. This shows how important it is to act on climate change and mitigation policies, as well as stop subsidies that harm the environment and promote climate-smart agriculture and ecosystem restoration. Pakistan has made commitments and adopted measures to address climate change. However, the effectiveness of these strategies remains low, and they still need to improve and face significant challenges in achieving their climate targets. The point of Pakistan's recent climate strategies in enhancing climate change is hindered by its high external debt, dependence on imported fossil fuels, and challenges in implementing renewable energy initiatives. The country must focus on developing domestic renewable energy sources, attracting international financial support, and addressing the high cost and low investor interest in new coal plants to mitigate climate change effectively <sup>211</sup>.

Pakistan has promised and taken steps to tackle climate change, but the effectiveness of these strategies remains low. It's hard for the country to reach its goals about fighting changes

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<sup>209</sup> Ahmed et al., "Assessing and Prioritizing the Climate Change Policy Objectives for Sustainable Development in Pakistan."

<sup>210</sup> Ali and Iqbal, "National Disaster Management Act, 2010 of Pakistan: A Review."

<sup>211</sup> Personal et al., "Natural Hazards and Disaster Management in Pakistan."

in weather patterns. The point of Pakistan's recent climate strategies in enhancing climate change is hindered by its high external debt, dependence on imported fossil fuels, and challenges in implementing renewable energy initiatives. The country must focus on developing domestic renewable energy sources, attracting international financial support, and addressing the high cost and low investor interest in new coal plants to mitigate climate change effectively.

### **6.11. Conclusion**

Throughout, Pakistan has been conducting several initiatives to combat climate change and its consequences such as pledging gender equality; making a Nationally Determined Contribution NDC for the mitigation of climate change, formulating policies and actions like National Climate Change Policy (NCCP), Climate Change Task Force, and National Command and Operation Center (NCOC). The country has also been focusing on empowering its youth, promoting nature-based solutions, and leveraging market-based climate policy instruments.

Some successful climate resilience projects in Pakistan include the Ten Billion Tree Tsunami, which has planted more than 1.42 billion trees and rehabilitated degraded ecosystems, and the Clean Green Pakistan Movement that seeks to educate people about cleanliness and climate change through the Clean Green Pakistan Index (CGPI). Furthermore, Pakistan's Ecosystem Restoration Initiative focuses on rehabilitating 30% of degraded forests and 5% of degraded croplands. Overall, Pakistan has been actively working on addressing climate change and its impacts, implementing various policies and initiatives to promote climate.

## **CHAPTER 07: FINDINGS AND CONCLUSION**

### **7.1. Findings**

Climate change poses significant non-traditional security threats to Pakistan, affecting various aspects of national security, including territorial integrity, military, intelligence capacity, social factors, and behavior. This Study "Climate Change As a Non-Traditional Security Threat: Case Study Of Environmental Security In Pakistan" discusses the following key points:

1. National security is a multifaceted concept that has evolved to include non-traditional threats such as climate change, which has far-reaching economic and business implications. Climate change is a substantial security threat to the entire nation and state, with a financially constrained country like Pakistan facing challenges in providing swift remedies to address such issues.
2. Harsh climatic conditions in glaciers, seas, or on the ground can precipitate significant disasters for a country, affecting its territorial integrity and the military's vulnerability to such challenges.
3. Climate change has profound implications for human security, with environmental effects significantly influencing ordinary people and communities' values.
4. Criminal activities surge during natural and artificial crises, compromising human security.
5. The collective impact of climate change issues is considered a substantial challenge to Pakistan's national security, emphasizing the importance of international and regional cooperation in combating climate change.
6. Thesis outlines the targets and indicators for SDG 13 (Climate Action) and the role of these targets and indicators in measuring progress towards achieving the Sustainable Development Goals (SDGs). Progress in climate action (SDG 13) is limited, requiring renewed political will, commitment, and resource allocation
7. Pakistan has implemented several policies and strategies to mitigate climate-induced environmental security challenges, such as the National Climate Change Policy (NCCP) and the establishment of SDG support units at federal and provincial levels.

8. Pakistan has made progress and achievements in the Paris Agreement, submitting an updated Nationally Determined Contributions (NDC) and considering instruments for enhanced climate ambition provided under Article 6 of the Paris Agreement.
9. The implementation of the Sendai Framework has contributed to a reduction in Pakistan's Climate Vulnerability Index, although more efforts are needed to further minimize vulnerability.
10. The study also provides statistics and specific challenges faced by Pakistan, such as its vulnerability to climate change, ranking among the top 10 most affected countries in the world, and the 14th position among the 17 countries facing extremely high-water risk globally.
11. The study provides a comprehensive overview of the implications of climate change as a non-traditional security threat for Pakistan, along with the country's efforts and challenges in addressing this complex issue.

## **7.2. Recommendations**

This study presents several recommendations based on its findings. These recommendations are crucial for addressing the non-traditional security threats posed by climate change in Pakistan. Some of the key recommendations include:

1. **Comprehensive Security Policy:** Pakistan should develop a comprehensive security policy that addresses both traditional and non-traditional security threats, considering the multifaceted impacts of climate change on national security, governance, and societal fabric.
2. **International and Regional Cooperation:** Emphasize the importance of international and regional cooperation in combating climate change, as the collective impact of climate change issues is considered a substantial challenge to Pakistan's national security.
3. **Implementation of SDG 13 Targets:** The country should focus on implementing the targets and indicators for SDG 13 (Climate Action) to measure progress towards achieving the Sustainable Development Goals (SDGs).
4. **Policy and Strategies:** Continue the implementation of policies and strategies to mitigate climate-induced environmental security challenges, such as the National Climate

Change Policy (NCCP) and ensure effective integration of climate change measures into national policies and planning.

5. **Gender-Sensitive Approaches:** Promote gender-sensitive approaches to climate change adaptation and mitigation, as well as incorporate youth and women in greater climate action.

6. **Climate Finance:** Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to mobilize \$100 billion annually for climate finance.

7. **Education and Awareness:** Improve education, awareness-raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

These recommendations are essential for Pakistan to address the significant non-traditional security threats posed by climate change and to work towards a more sustainable and secure future for the country.

### **7.3. Conclusion**

Pakistan is dealing with the tangible impacts of climate change, evidenced by increased occurrences of droughts, floods, erratic weather patterns, shifts in agriculture, reduced water supply, and biodiversity loss. These challenges pose significant threats to the nation's water, food, and energy security, extending beyond traditional military concerns. Climate change affects various security facets, including economic, environmental, and human security, with consequences such as agricultural disruptions, large-scale displacement, increased criminality, and heightened vulnerability of women. The country faces water insecurity, ranking 14th globally in extremely high-water risk. This environmental crisis also jeopardizes territorial integrity and national sovereignty, potentially leading to conflicts.

While Pakistan has shown a slight improvement in its Sustainable Development Goals (SDGs) ranking, it still faces substantial challenges in achieving these goals, with an annual financing gap and structural governance issues. Notably, the country has made strides in some SDGs, particularly in education and responsible consumption, but progress in climate action (SDG 13) is limited despite achieving its targets ahead of the 2030 deadline. The need for renewed

political will, commitment, and resources is emphasized to make SDGs a reality for the population.

In addressing climate change, Pakistan has adopted the National Climate Change Policy (NCCP), aligning with international agreements. The policy emphasizes both mitigation and adaptation action and introduces key initiatives like the "Ten Billion Tree Tsunami Program" and "Clean Green Pakistan Movement". The NCCP underscores the importance of international and regional cooperation, incorporates gender-sensitive approaches, and includes plans to involve youth and women in climate action. Regular updates to the policy reflect its adaptability to the evolving science of climate change, providing a comprehensive framework for Pakistan's present and future climate challenges.

## BIBLIOGRAPHY

- Abas, N, A Kalair, N Khan, and A R Kalair. "Review of GHG Emissions in Pakistan Compared to SAARC Countries." *Renewable and Sustainable Energy Reviews*, 2017. <https://doi.org/10.1016/j.rser.2017.04.022>.
- Abbasi, Zakeer Ahmed Khan, Allah Nawaz, Aklilu Amsalu & Alebachew Adem, Zulfaqar Sa'adi, Shamsuddin Shahid, Tarmizi Ismail, Eun Sung Chung, et al. "The Impact of Climate Change on Pastoral Production Systems: A Study of Climate Variability and Household Adaptation Strategies in Southern Ethiopian Rangelands." *Climate and Development* 5, no. 1 (2014).
- Adnan, Mubeen. "Pakistan's Crisis Management: Examining Proactive and Reactive Strategies Mubeen Adnan\*." *Journal of Political Studies* 21 (2014).
- Ahmed, Waqas, Qingmei Tan, Ghulam Muhammad Shaikh, Hamid Waqas, Nadeem Ahmed Kanasro, Sharafat Ali, and Yasir Ahmed Solangi. "Assessing and Prioritizing the Climate Change Policy Objectives for Sustainable Development in Pakistan." *Symmetry* 12, no. 8 (2020). <https://doi.org/10.3390/SYM12081203>.
- Aitsi-Selmi, Amina, and Virginia Murray. "Protecting the Health and Well-Being of Populations from Disasters: Health and Health Care in the Sendai Framework for Disaster Risk Reduction 2015-2030." *Prehospital and Disaster Medicine* 31, no. 1 (2015). <https://doi.org/10.1017/S1049023X15005531>.
- Aitsi-Selmi, Amina, Virginia Murray, Chadia Wannous, Chloe Dickinson, David Johnston, Akiyuki Kawasaki, Anne Sophie Stevance, and Tiffany Yeung. "Reflections on a Science and Technology Agenda for 21st Century Disaster Risk Reduction: Based on the Scientific Content of the 2016 UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–20." *International Journal of Disaster Risk Science* 7, no. 1 (2016). <https://doi.org/10.1007/s13753-016-0081-x>.
- Akram, Naeem, and Abdul Hamid. "Climate Change: A Threat to the Economic Growth of Pakistan." *Progress in Development Studies* 15, no. 1 (2015). <https://doi.org/10.1177/1464993414546976>.

- Alam, A, and S Gul. “Global Climate Change: A Threat Multiplier to Pak-Afghan Constrained,” 2021.
- Albert, Mathias, and Barry Buzan. “Securitization, Sectors and Functional Differentiation.” *Security Dialogue* 42, no. 4–5 (2011): 413–25.
- Ali, Arshad, and M Jawed Iqbal. “National Disaster Management Act, 2010 of Pakistan: A Review.” *Journal of Disaster and Emergency Research*, 2021. <https://doi.org/10.18502/jder.5810>.
- Ali, Faizan, Tooba Asim Khan, Aamir Alamgir, and Moazzam Ali Khan. “Climate Change-Induced Conflicts in Pakistan: From National to Individual Level.” *Earth Systems and Environment* 2 (2018): 573–99.
- Anjum, Muhammad Shehzaib, Syeda Mahnoor Ali, Muhammad Ahmed Subhani, Muhammad Naveed Anwar, Abdul-Sattar Nizami, Umar Ashraf, Muhammad Fahim Khokhar, and others. “An Emerged Challenge of Air Pollution and Ever-Increasing Particulate Matter in Pakistan; a Critical Review.” *Journal of Hazardous Materials* 402 (2021): 123943.
- Aslam, Bilal, Shabnam Gul, and Muhammad Faizan Asghar. “Evaluation of Environmental Degradation as an Unprecedented Threat to Human Security in Pakistan.” *Liberal Arts and Social Sciences International Journal (LASSIJ)* 5, no. 1 (2021): 197–211.
- Assembly, General. “Resolution Adopted by the General Assembly on 6 July 2017.” In *Technical Report A/RES/71/313*, 2017.
- Azhar, Aisha, Muhammad Nasir Malik, and Asif Muzaffar. “Social Network Analysis of Army Public School Shootings: Need for a Unified Man-Made Disaster Management in Pakistan.” *International Journal of Disaster Risk Reduction* 34 (2019). <https://doi.org/10.1016/j.ijdr.2018.11.024>.
- Bajpai, Kanti P. *Human Security: Concept and Measurement*. Citeseer, 2000.
- Bank, World. *World Development Report 1994: Infrastructure for Development*. The World Bank, 1994.
- Barnett, Jon. “Security and Climate Change.” *Global Environmental Change* 13, no. 1 (2003): 7–17.



———. *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era*. Zed Books, 2001.

BARRECH, DOST, FIDA BAZAI, SAFIA BANO, SAMRA NAZ, SADIQ KHAN, NOOR FATIMA, and others. “PAKISTAN’S NATIONAL SECURITY POLICY: OPPORTUNITIES AND CHALLENGES.” *Russian Law Journal* 11, no. 3 (2023).

Barthwal-Datta, Monika. *Understanding Security Practices in South Asia: Securitization Theory and the Role of Non-State Actors*. Routledge, 2012.

Bast, Joseph L. *Seven Theories of Climate Change*. Heartland Institute Chicago, 2010.

Bhandari, Medani P. “Climate Change Impacts on Agriculture, a Case Study of Bangladesh, India, Nepal, and Pakistan.” *SocioEconomic Challenges* 5, no. 2 (2021). [https://doi.org/10.21272/sec.5\(2\).35-48.2021](https://doi.org/10.21272/sec.5(2).35-48.2021).

Bogers, Maya, Frank Biermann, Agni Kalfagianni, Rakhyun E Kim, Jelle Treep, and Martine G de Vos. “The Impact of the Sustainable Development Goals on a Network of 276 International Organizations.” *Global Environmental Change* 76 (2022). <https://doi.org/10.1016/j.gloenvcha.2022.102567>.

Bosco, F, A Jordan, Z Krieger, R Lewis, A Ogée, T Philbeck, A Pipikaite, and A Uzunova. “The Global Risks Report 2020| World Economic Forum.” *The Global Risks Report*, 2020.

Bullard, Gabe. “See What Climate Change Means for the World’s Poor.” *National Geographic*, 2015.

Buzan, B. “New Patterns of Global Security in the Twenty-First Century.” *International Affairs* 67, no. 3 (1991): 431–51.

Buzan, Barry. *People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era*. ECPR press, 2008.

Buzan, Barry, Ole Wæver, and Jaap De Wilde. *Security: A New Framework for Analysis*. Lynne Rienner Publishers, 1998.

Byerly, Margaret E. “A Report to the IPCC on Research Connecting Human Settlements,

- Infrastructure, and Climate Change.” *Pace Environmental Law Review* 28, no. 3 (2011). <https://doi.org/10.58948/0738-6206.1680>.
- Caballero-Anthony, Mely. “An Introduction to Non-Traditional Security Studies: A Transnational Approach.” *An Introduction to Non-Traditional Security Studies*, 2015, 1–296.
- . *An Introduction to Non-Traditional Security Studies: A Transnational Approach*. *An Introduction to Non-Traditional Security Studies: A Transnational Approach*, 2018. <https://doi.org/10.4135/9781473972308>.
- Cerf, Marlon E. “The Sustainable Development Goals: Contextualizing Africa’s Economic and Health Landscape.” *Global Challenges* 2, no. 8 (2018). <https://doi.org/10.1002/gch2.201800014>.
- Chaudhry, Kinza Tasleem. “Environmental Policy Analysis of Pakistan: A Theoretical Perspective.” *Journal of Development and Social Sciences* 3, no. 4 (2022): 507–21.
- Coliandris, Mike. “Book Review: An Introduction to Non-Traditional Security Studies: A Transnational Approach.” *The Police Journal: Theory, Practice and Principles* 89, no. 1 (2016). <https://doi.org/10.1177/0032258x16638644>.
- Conceição, Pedro. “Human Development Report 2020-The Next Frontier: Human Development and the Anthropocene.” *United Nations Development Programme: Human Development Report*, 2020.
- Dell, Melissa, Benjamin F Jones, and Benjamin a Olken. “Climate Shocks and Economic Growth: Evidence from the Last Half Century.” *Africa* 21, no. 3 (2008).
- Depledge, Joanna. “The ‘Top-down’ Kyoto Protocol? Exploring Caricature and Misrepresentation in Literature on Global Climate Change Governance.” *International Environmental Agreements: Politics, Law and Economics* 22, no. 4 (2022). <https://doi.org/10.1007/s10784-022-09580-9>.
- Dessler, Andrew E, and Edward A Parson. *The Science and Politics of Global Climate Change: A Guide to the Debate*. Cambridge University Press, 2019.
- Eckstein, David, Vera Künzel, and Laura Schäfer. *The Global Climate Risk Index 2021*. Bonn:

Germanwatch, 2021.

Faisal, Farida. "SUSTAINABILITY." *Pakistan Economic and Social Review* 55, no. 1 (2017).

Faisal, Farida, and Mehr Ali Shah. "SUSTAINABILITY: AN IMPERATIVE FOR IMPROVING GOVERNANCE AND MANAGEMENT IN PAKISTAN." *Pakistan Economic and Social Review*, 2017.

Fever, Donald, and Benedict Sheehy. "CLIMATE POLICY AND BORDER ADJUSTMENT REGULATION: DESIGNING A COHERENT RESPONSE." *Melbourne Journal of International Law* 13 (2012).

Filho, Walter Leal, Thomas Hickmann, Gustavo J Nagy, Patricia Pinho, Ayyoob Sharifi, Aprajita Minhas, M Rezaul Islam, Riyanti Djalanti, Antonio García Vinuesa, and Ismaila Rimi Abubakar. "The Influence of the Corona Virus Pandemic on Sustainable Development Goal 13 and United Nations Framework Convention on Climate Change Processes." *Frontiers in Environmental Science* 10 (2022). <https://doi.org/10.3389/fenvs.2022.784466>.

Floyd, Rita. "The Environmental Security Debate and Its Significance for Climate Change." *The International Spectator* 43, no. 3 (2008): 51–65.

Fonseca, Luis Miguel, José Pedro Domingues, and Alina Mihaela Dima. "Mapping the Sustainable Development Goals Relationships." *Sustainability (Switzerland)* 12, no. 8 (2020). <https://doi.org/10.3390/SU12083359>.

for Disaster Risk Reduction, U N Office. "Essential Four: Pursue Resilient Urban Development and Design." *Making Cities Resilient: My City Is Getting Ready*, 2019.

Gaire, Damodar, and Jyotshna Amatya. "Impacts Assessment and Climate Change Adaptation Strategies in Makawanpur District, Nepal." *Focus*, 2008.

Gao, Yun, Xiang Gao, and Xiaohua Zhang. "The 2 °C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change—From the United Nations Framework Convention on Climate Change to the Paris Agreement." *Engineering* 3, no. 2 (2017). <https://doi.org/10.1016/J.ENG.2017.01.022>.

General, Assemblée. *Transforming Our World: The 2030 Agenda for Sustainable*

*Development*. UN, 2015.

Gupta, Joyeeta, and Courtney Vegelin. “Sustainable Development Goals and Inclusive Development.” *International Environmental Agreements: Politics, Law and Economics* 16, no. 3 (2016). <https://doi.org/10.1007/s10784-016-9323-z>.

Homer-Dixon, Thomas F. “Environmental Scarcities and Violent Conflict: Evidence from Cases.” *International Security* 19, no. 1 (1994): 5–40.

Hussain, Mudassar, Abdul Rahman Butt, Faiza Uzma, Rafay Ahmed, Samina Irshad, Abdul Rehman, and Balal Yousaf. “A Comprehensive Review of Climate Change Impacts, Adaptation, and Mitigation on Environmental and Natural Calamities in Pakistan.” *Environmental Monitoring and Assessment* 192 (2020): 1–20.

Iacobuță, Gabriela Ileana, Clara Brandi, Adis Dzebo, and Sofia Donaji Elizalde Duron. “Aligning Climate and Sustainable Development Finance through an SDG Lens. The Role of Development Assistance in Implementing the Paris Agreement.” *Global Environmental Change* 74 (2022). <https://doi.org/10.1016/j.gloenvcha.2022.102509>.

Ikram, Maryam, and Husaina Banu Kenayathulla. “Education Quality and Student Satisfaction Nexus Using Instructional Material, Support, Classroom Facilities, Equipment and Growth: Higher Education Perspective of Pakistan.” *Frontiers in Education* 8 (2023). <https://doi.org/10.3389/educ.2023.1140971>.

Imperatives, Strategic. “Report of the World Commission on Environment and Development: Our Common Future.” *Accessed Feb 10* (1987): 1–300.

Islam, Md Nazrul, Sahanaj Tamanna, Md Noman, Al Rabby Siemens, S M Rashedul Islam, and Md Shahriar Islam. “Climate Change Diplomacy, Adaptation, and Mitigation Strategies in South Asian Countries: A Critical Review.” *India II: Climate Change Impacts, Mitigation and Adaptation in Developing Countries*, 2022, 1–32.

Kayano, Ryoma, Emily Y Y Chan, Virginia Murray, Jonathan Abrahams, and Sarah Louise Barber. “WHO Thematic Platform for Health Emergency and Disaster Risk Management Research Network (TPRN): Report of the Kobe Expert Meeting.” *International Journal of Environmental Research and Public Health*, 2019. <https://doi.org/10.3390/ijerph16071232>.

- Khalid, Fatima, Muhammad Babar Taj, Asma Jamil, Huda Kamal, Tahira Afzal, Muhammad Jamshed Iqbal, Tahseenullah Khan, et al. “Deforestation Dynamics in Pakistan: A Critical Review: Deforestation Dynamics.” *Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences* 57, no. 3 (2020): 27–34.
- Khan, Imran, and Karim Haider Syed. “CLEAN GREEN PAKISTAN MOVEMENT: A WAY TO COMBAT THE CHALLENGES OF CLIMATE CHANGE.” *Gomal University Journal of Research* 37, no. 04 (2021). <https://doi.org/10.51380/gujr-37-04-07>.
- Khan, Mizan, Stacy ann Robinson, Romain Weikmans, David Ciplet, and J Timmons Roberts. “Twenty-Five Years of Adaptation Finance through a Climate Justice Lens.” *Climatic Change* 161, no. 2 (2020). <https://doi.org/10.1007/s10584-019-02563-x>.
- Khan, Mohammad Aslam, Jawed Ali Khan, Zulfiqar Ali, Imran Ahmad, and Muhammad Nauman Ahmad. “The Challenge of Climate Change and Policy Response in Pakistan.” *Environmental Earth Sciences* 75 (2016): 1–16.
- Khan, Muhammad Aamir, Alishba Tahir, Nabila Khurshid, Muhammad Iftikhar ul Husnain, Mukhtar Ahmed, and Houcine Boughanmi. “Economic Effects of Climate Change-Induced Loss of Agricultural Production by 2050: A Case Study of Pakistan.” *Sustainability* 12, no. 3 (2020): 1216.
- Khan, Muhammad Bahar, and others. “DEFORESTATION IN PAKISTAN AND ITS INFLUENCE ON NATURAL PRODUCTION.” *International Research Journal of Social Sciences and Humanities* 2, no. 1 (2023): 36–44.
- Khan, Muhammad Daud, Anwar Ali, Arif Iqbal, Zia-Ur-Rehman, Waqar Ahmed, and Saba Ali Arooj. “Monitoring of Afforestation Activities Using Landsat-8 Temporal Images, Billion Trees Afforestation Project, Pakistan.” *Nova Mehanizacija Sumarstva* 42, no. 1 (2021). <https://doi.org/10.5552/nms.2021.3>.
- Khan, Samiullah. “Climate Change Adaptation Strategies and Policies in Pakistan: A Critical Review.” *Environmental Science and Pollution Research* 28, no. 29 (2021): 38434–49.
- Khan, Z. “Climate Induced Migration in Pakistan: Global Discourse, Local Realities and Governance.” Islamic Relief Worldwide and Islamic Relief Pakistan, 2021.

- Kota, Hima Bindu, Gurinder Singh, Monir Mir, Ciorstan Smark, and Bhawna Kumar. “Sustainable Development Goals and Businesses.” *Australasian Accounting, Business and Finance Journal* 15, no. 5 Special Issue (2021). <https://doi.org/10.14453/aabfj.v15i5.1>.
- Krauss, Judith E. “Unpacking SDG 15, Its Targets and Indicators: Tracing Ideas of Conservation.” *Globalizations* 19, no. 8 (2022). <https://doi.org/10.1080/14747731.2022.2035480>.
- Lecocq, F, and Z Shalizi. “How Might Climate Change Affect Economic Growth in Developing Countries? A Review of the Growth Literature with a Climate Lens.” *World Bank Policy Research Working Paper*, 2007.
- Lee, Hsiang Chieh, and Hongey Chen. “Implementing the Sendai Framework for Disaster Risk Reduction 2015–2030: Disaster Governance Strategies for Persons with Disabilities in Taiwan.” *International Journal of Disaster Risk Reduction* 41 (2019). <https://doi.org/10.1016/j.ijdrr.2019.101284>.
- Levine, Simon, Eva Ludi, and Lindsey Jones. “Rethinking Support for Adaptive Capacity to Climate Change.” *Oxfam Policy and Practice: Climate Change and Resilience* 7, no. 5 (2011).
- Li, Boyi, Adu Gong, Longfei Liu, Jing Li, Jinglin Li, Lingling Li, Xiang Pan, and Zikun Chen. “An Earth Observation Framework in Service of the Sendai Framework for Disaster Risk Reduction 2015–2030.” *ISPRS International Journal of Geo-Information* 12, no. 6 (2023). <https://doi.org/10.3390/ijgi12060232>.
- Maamoun, Nada. “The Kyoto Protocol: Empirical Evidence of a Hidden Success.” *Journal of Environmental Economics and Management* 95 (2019). <https://doi.org/10.1016/j.jeem.2019.04.001>.
- Malik, Mahvish, and Misbah Arif. “Managing Non-Traditional Threats by Using Space Technology: A Case of Pakistan.” *NUST Journal of International Peace and Stability*, 2019. <https://doi.org/10.37540/njips.v2i2.30>.
- Marshall, Hollianne. “Book Review: An Introduction to Non-Traditional Security Studies: A Transnational Approach.” *International Review of Victimology* 24, no. 3 (2018).

<https://doi.org/10.1177/0269758018762632>.

Masud, Mamoon, and Suleman Mazhar. “Development of a Low-Cost Autonomous Underwater Vehicle for Irrigation Canal Monitoring.” In *International Conference on Offshore Mechanics and Arctic Engineering*, 58837:V006T05A031, 2019.

Mir, Kaleem Anwar, Pallav Purohit, Sylvain Cail, and Seungdo Kim. “Co-Benefits of Air Pollution Control and Climate Change Mitigation Strategies in Pakistan.” *Environmental Science and Policy* 133 (2022). <https://doi.org/10.1016/j.envsci.2022.03.008>.

Mitchell, Dann, Myles R Allen, Jim W Hall, Benito Muller, Lavanya Rajamani, and Corinne Le Quéré. “The Myriad Challenges of the Paris Agreement.” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 2018. <https://doi.org/10.1098/rsta.2018.0066>.

Mittha, Maroof. “Renewable Energy Policy in Pakistan: A Critique,” n.d.

Mohiuddin, Iqra, Muhammad Asif Kamran, Shokhrukh Mirzo Jalilov, Mobin ud Din Ahmad, Sultan Ali Adil, Raza Ullah, and Tasneem Khaliq. “Scale and Drivers of Female Agricultural Labor: Evidence from Pakistan.” *Sustainability (Switzerland)* 12, no. 16 (2020). <https://doi.org/10.3390/su12166633>.

Mukhtar, Rabiya. “Review of National Multi-Hazard Early Warning System Plan of Pakistan in Context with Sendai Framework for Disaster Risk Reduction.” In *Procedia Engineering*, Vol. 212, 2018. <https://doi.org/10.1016/j.proeng.2018.01.027>.

Mumtaz, Muhammad. “The National Climate Change Policy of Pakistan: An Evaluation of Its Impact on Institutional Change.” *Earth Systems and Environment* 2 (2018): 525–35.

Murray, Virginia. “Science and Technology Commitment to the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030,” 2021. [https://doi.org/10.1007/978-981-15-8662-0\\_4](https://doi.org/10.1007/978-981-15-8662-0_4).

Nagabhatla, Nidhi, Panthea Pouramin, Rupal Brahmhatt, Cameron Fioret, Talia Glickman, K Bruce Newbold, and Vladimir Smakhtin. “Water and Migration: A Global Overview.” *UNU-INWEH Report Series* 10 (2020).

NCCP. “National Climate Change Policy 2021,” 2021.

- Nhamo, Godwell, and Shepherd Muchuru. "Climate Adaptation in the Public Health Sector in Africa: Evidence from United Nations Framework Convention on Climate Change National Communications." *Jamba: Journal of Disaster Risk Studies* 11, no. 1 (2019). <https://doi.org/10.4102/JAMBA.V11I1.644>.
- Nie, Yong, Hamish D Pritchard, Qiao Liu, Thomas Hennig, Wenling Wang, Xiaoming Wang, Shiyin Liu, et al. "Glacial Change and Hydrological Implications in the Himalaya and Karakoram." *Nature Reviews Earth & Environment* 2, no. 2 (2021): 91–106.
- Obaideen, Khaled, Nabila Shehata, Enas Taha Sayed, Mohammad Ali Abdelkareem, Mohamed S Mahmoud, and A G Olabi. "The Role of Wastewater Treatment in Achieving Sustainable Development Goals (SDGs) and Sustainability Guideline." *Energy Nexus* 7 (2022). <https://doi.org/10.1016/j.nexus.2022.100112>.
- on Drugs, United Nations Office, and Crime (UNODC). "Climate Change, Trafficking in Persons and Smuggling of Migrants," 2022. [https://www.unodc.org/documents/human-trafficking/GLO-ACTII/UNODC\\_Climate-TIP-SOM\\_Policy\\_Paper.pdf](https://www.unodc.org/documents/human-trafficking/GLO-ACTII/UNODC_Climate-TIP-SOM_Policy_Paper.pdf).
- Organization, World Health. "Health Indicators of Sustainable Cities." *The Rio+20 UN Conference on Sustainable Development*, no. May (2012).
- Pachauri, Rajendra K, Myles R Allen, Vicente R Barros, John Broome, Wolfgang Cramer, Renate Christ, John A Church, et al. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Ipcc, 2014.
- Pakistan, Consultancy, Noman Ahmad Abbasi, Noor Azniza bt Ishak, and Sulaman Hafeez Siddiqui. "Journal of Business and Social Review in Emerging Economies," 2020.
- Park, Young-Woo. "The Environment and Climate Change: Outlook of Pakistan." *United Nations Environment Programme (UNEP)* 107 (2013).
- Pathania, Jyoti M. "BANGLADESH: Non-Traditional Security." *South Asia Analysis Group Paper*, no. 751 (2003).
- Personal, Munich, Repec Archive, Himayatullah Khan, and Abuturab Khan. "Natural Hazards and Disaster Management in Pakistan." *Journal of Disasters and Environment* 5, no. 4



(2010).

Pörtner, Hans-O, Debra C Roberts, Helen Adams, Carolina Adler, Paulina Aldunce, Elham Ali, Rawshan Ara Begum, et al. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. IPCC Geneva, Switzerland:, 2022.

Quilligan, James Bernard. “The Brandt Equation: 21 St Century Blueprint for the New Global Economy,” 2002.

Rasoolimanesh, S Mostafa, Sundari Ramakrishna, C Michael Hall, Kourosh Esfandiar, and Siamak Seyfi. “A Systematic Scoping Review of Sustainable Tourism Indicators in Relation to the Sustainable Development Goals.” *Journal of Sustainable Tourism* 31, no. 7 (2023). <https://doi.org/10.1080/09669582.2020.1775621>.

Rasul, Golam, Nilhari Neupane, Abid Hussain, and Binaya Pasakhala. “Beyond Hydropower: Towards an Integrated Solution for Water, Energy and Food Security in South Asia.” *International Journal of Water Resources Development* 37, no. 3 (2021): 466–90.

Ritchie, Roser, and Ortiz-Ospina Mispy. “Measuring Progress towards the Sustainable Development Goals.” *SDG-Tracker. Org, Website*, 2018, 805–14.

Rosen, Amanda M. “The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change.” *Politics and Policy* 43, no. 1 (2015). <https://doi.org/10.1111/polp.12105>.

Sahu, Anjan Kumar. “The Securitisation Of The Climate Change Issue.” *World Affairs: The Journal of International Issues* 21, no. 4 (2017): 26–37.

Sampedro, Rodriguez. “The Sustainable Development Goals (SDG).” *Carreteras* 4, no. 232 (2021). <https://doi.org/10.1201/9781003080220-8>.

Scheyvens, Regina, Anna Carr, Apisalome Movono, Emma Hughes, Freya Higgins-Desbiolles, and Jason Paul Mika. “Indigenous Tourism and the Sustainable Development Goals.” *Annals of Tourism Research* 90 (2021). <https://doi.org/10.1016/j.annals.2021.103260>.

Secretariat, United Nations Climate Change. “Opportunities and Options for Integrating Climate Change Adaptation with the Sustainable Development Goals and the Sendai

- Framework for Disaster Risk Reduction 2015 – 2030.” *Technical Paper*, 2017.
- “Sendai Framework for Disaster Risk Reduction 2015-2030.” *Australian Journal of Emergency Management* 30, no. 3 (2015).
- Shahbaz, Pomi, Shamsheer ul Haq, Azhar Abbas, Zahira Batool, Bader Alhafi Alotaibi, and Roshan K Nayak. “Adoption of Climate Smart Agricultural Practices through Women Involvement in Decision Making Process: Exploring the Role of Empowerment and Innovativeness.” *Agriculture (Switzerland)* 12, no. 8 (2022). <https://doi.org/10.3390/agriculture12081161>.
- Shahzad, Khurram, Baozhou Lu, Daud Abdul, Adnan Safi, Muhammad Umar, and Numan Khan Afridi. “Assessment of Biomass Energy Barriers towards Sustainable Development: Application of Pythagorean Fuzzy AHP.” *Geological Journal* 58, no. 4 (2023). <https://doi.org/10.1002/gj.4680>.
- Shekhar, Mayank, Anshuman Bhardwaj, Shaktiman Singh, Parminder S Ranhotra, Amalava Bhattacharyya, Ashish K Pal, Ipsita Roy, F Javier Mart\in-Torres, and Mar\ia-Paz Zorzano. “Himalayan Glaciers Experienced Significant Mass Loss during Later Phases of Little Ice Age.” *Scientific Reports* 7, no. 1 (2017): 10305.
- Siddiqua, Ayesha, John N Hahladakis, and Wadha Ahmed K A Al-Attiya. “An Overview of the Environmental Pollution and Health Effects Associated with Waste Landfilling and Open Dumping.” *Environmental Science and Pollution Research* 29, no. 39 (2022): 58514–36.
- Siddiqui, Jumaina. “Pakistan’s Climate Challenges Pose a National Security Emergency.” *United States Institute of Peace*, Jul, 2022.
- Slater, Rachel, Rebecca Holmes, and Nicholas Mathers. “Food and Nutrition (in-) Security and Social Protection,” 2014.
- Subramaniam, Nava, Suraiyah Akbar, Hui Situ, Sophia Ji, and Nirav Parikh. “Sustainable Development Goal Reporting: Contrasting Effects of Institutional and Organisational Factors.” *Journal of Cleaner Production* 411 (2023). <https://doi.org/10.1016/j.jclepro.2023.137339>.

- Sun, Ruo Shui, Xiang Gao, Liang Chun Deng, and Can Wang. “Is the Paris Rulebook Sufficient for Effective Implementation of Paris Agreement?” *Advances in Climate Change Research* 13, no. 4 (2022). <https://doi.org/10.1016/j.accre.2022.05.003>.
- Sussman, Ann, and Justin Hollander. *Cognitive Architecture: Designing for How We Respond to the Built Environment*. Routledge, 2021.
- Syihabuddin, Muhammad, and Neni Ruhaeni. “Emisi Gas Rumah Kaca Berdasarkan the Kyoto Protocol of 1997 Dan Implementasinya Di Indonesia.” *Bandung Conference Series: Law Studies*, 2022.
- Tramontin, Vittorio, Claudia Loggia, and Martina Basciu. “Passive Design and Building Renovation in the Mediterranean Area: New Sensitive Approach for Sustainability.” *Journal of Civil Engineering and Architecture* 4, no. 36 (2010).
- Trogrlić, RobertŠakić, Lydia Cumiskey, Annisa Triyanti, Melanie J Duncan, Nuha Eltinay, Rick J Hogeboom, Mansi Jasuja, Chinaporn Meechaiya, Christina J Pickering, and Virginia Murray. “Science and Technology Networks: A Helping Hand to Boost Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030?” *International Journal of Disaster Risk Science* 8, no. 1 (2017). <https://doi.org/10.1007/s13753-017-0117-x>.
- Trombetta, Maria Julia. “Environmental Security and Climate Change: Analysing the Discourse.” *Cambridge Review of International Affairs* 21, no. 4 (2008): 585–602.
- ul Haq, Shamsheer, Pomi Shahbaz, Azhar Abbas, Bader Alhafi Alotaibi, Nasir Nadeem, and Roshan K Nayak. “Looking up and Going down: Does Sustainable Adaptation to Climate Change Ensure Dietary Diversity and Food Security among Rural Communities or Vice Versa?” *Frontiers in Sustainable Food Systems* 7 (2023). <https://doi.org/10.3389/fsufs.2023.1142826>.
- Ullah, Asad, Sayyed Iftekhhar Ahmad, Rafi Ullah, Atta Ullah Khan, Sikandar Khan, Waheed Ullah, and Abdul Waris. “Climatic Changes and Their Effect on Wildlife of District Dir Lower, Khyber Pakhtunkhwa, Pakistan.” *Journal of Atmospheric Science Research* 3, no. 4 (2020): 38–43.
- UNFCCC. “Pakistan’s Intended Nationally Determined Contributions,” 2016.

- . “What Is the Kyoto Protocol? | UNFCCC.” *United Nations Climate Change*, 2019.
- Vater, J J. “The Indus Waters Treaty: Prospects for India-Pakistan Peace,” 2021.
- Vaughn, Bruce, Nicole T Carter, Pervaze A Sheikh, and Renée Johnson. *Security and the Environment in Pakistan*. Congressional Research Service, 2010.
- Waheed, Abdul, Thomas Bernward Fischer, Sajida Kousar, and Muhammad Irfan Khan. “Disaster Management and Environmental Policy Integration in Pakistan — an Evaluation with Particular Reference to the China–Pakistan Economic Corridor Plan.” *Environmental Science and Pollution Research* 30, no. 48 (2023). <https://doi.org/10.1007/s11356-023-29310-1>.
- Williams, Paul D. *Security Studies: An Introduction*. Routledge, 2012.
- Williams, Paul D, and Matt McDonald. “An Introduction to Security Studies.” In *Security Studies*, 2018. <https://doi.org/10.4324/9781315228358-1>.
- Woetzel, Jonathan, Dickon Pinner, and Hamid Samandari. “Climate Risk and Response: Physical Hazards and Socioeconomic Impacts,” 2020.
- Xiuhui, Jiang, and Muhammad Yousaf Raza. “Delving into Pakistan’s Industrial Economy and Carbon Mitigation: An Effort toward Sustainable Development Goals.” *Energy Strategy Reviews* 41 (2022). <https://doi.org/10.1016/j.esr.2022.100839>.
- Zahoor, Maham. “ENVIRONMENTAL INSECURITY IN PAKISTAN: CONTEMPORARY CHALLENGES AND RESPONSES.” *American International Journal of Humanities, Arts and Social Sciences* 4, no. 1 (2022): 1–6.
- Zala, Benjamin. “Contemporary Security Studies.” *Medicine, Conflict and Survival* 26, no. 4 (2010). <https://doi.org/10.1080/13623699.2010.535393>.
- Zarrabeitia-Bilbao, Enara, Rosa María Rio-Belver, Izaskun Alvarez-Meaza, and Itziar Martínez de Alegría-Mancisidor. “World Environment Day: Understanding Environmental Programs Impact on Society Using Twitter Data Mining.” *Social Indicators Research* 164, no. 1 (2022). <https://doi.org/10.1007/s11205-022-02957-y>.