

ENVIRONMENTAL SECURITY CHALLENGE AND PAKISTAN'S EFFORTS TO MITIGATE CLIMATE CHANGE: AN ANALYSIS

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ABSTRACT

Climate change poses a significant threat to life on Earth and our future development. Climate change is an important global environmental challenge that disrupts economic, natural, and social systems. The impacts of greenhouse gas emissions on global climate change are several, potentially extremely big, and most likely the most significant long-term environmental problem the world is now facing. Certain countries are more in danger than others due to the unequal distribution of these repercussions. However, the repercussions of climate change will be felt by all communities and countries. Climate change is posing a significant threat to Pakistan's environmental security, affecting all sectors and intensifying weather conditions. Pakistan is facing this crisis due to recent natural disasters such as floods, droughts, heat waves, and heavy rain. The country needs to prioritize securitization of the environment at the national security policy level, as it has been overlooked due to low politics. Despite previous governments implementing policies for environmental protection, the environment still holds immense vulnerabilities for citizens, livestock, agriculture, and the food web. There is a pressing need to focus on proper mitigation and adaptation measures to survive predicted calamities in Pakistan.

Keywords: Environmental, Security Challenge, Climate Change

INTRODUCTION

Climate change poses a significant threat to life on Earth and our future development. The Earth's average temperature has increased by 0.85 degrees in the atmosphere from 1880-2012, with human-induced greenhouse gas emissions leading to fluctuating precipitation patterns, frequent floods, droughts, intense heat waves, melting glaciers, and rising sea levels (Schneiderbauer & Ehrlich, 2004). These consequences are expected to continue due to human-induced greenhouse gas emissions (IPCC, 2007). Climate change has varying impacts worldwide, with different countries having varying vulnerability and exposure. To overcome this dilemma, it is crucial to reduce carbon emissions and adapt to the changes (Stern, 2006). Pakistan, among the top 20 countries, is gravely endangered by climate change, facing severe impacts such as recurrence of floods and droughts. Effective

responses across sectors like health, social services, education, transport, energy, and infrastructure require a 'whole-of-government' approach (Hussain, Mumtaz & Mumtaz, Saniea, 2014).

Pakistan is a developing nation that relies heavily on agriculture, making it particularly vulnerable to the effects of climate change because it lacks proper mechanisms for tracking extreme weather occurrences and weather patterns. This makes creating plans for catastrophe mitigation and quick responses challenging. Research on vulnerability and effect assessments was carried out to tackle this issue in significant industries, such as forestry, agriculture, biodiversity, coastal zones, livestock, water resources, energy, and socioeconomic sectors. For 2020 and 2050, the National Study Team suggested a 0.3°C temperature change and a 1.0% precipitation change per decade, after consulting with experts

from the Intergovernmental Panel on Climate Change. Water resources and agriculture were prioritized because of the possible effects of climate change on these industries. Pakistan must prioritize strengthening its ability to adapt to climate change due to its limited institutional and financial resources. The main goals of recommended adaptation measures have to be to lessen reliance on the current climate and to implement long-term ecological and human development objectives.

According to a study on Pakistan's climatic normal (1931–1960), higher monsoon cloudiness and rainfall caused cooling throughout northern and southeast Pakistan (Kruss, P. O. et al., 1992). Pakistan contributes roughly 0.4% of the world's emissions, with almost 30 million metric tons of carbon emissions produced annually in 2003 (GOP, 2003). The nation ratified the Kyoto Protocol in 2005 and has been actively involved in international efforts to mitigate climate change since the Rio Earth Summit in 1992 (Shahid & Adnan, 2021). It is essential to comprehend adaptability and vulnerability to implement effective mitigation techniques. Improved adaptive policies and sustainable management of catastrophe risk reduction programs can be achieved by analyzing and evaluating these underlying causes (Wisner et al., 2004). Pakistan is subject to extreme weather conditions, such as highs and lows, prolonged rainstorms, and flooding. In 2010, Pakistan recorded its highest temperature at 53.5°C (128.3°F), which is the fourth-highest temperature ever recorded worldwide. Pakistan has worked hard to create accurate surface air temperature records to combat climate change (Jeff Masters, 2010).

Pakistan's Environmental Security Quandary

Environmental security concerns, such as climate change, global warming, water shortages, food scarcity, floods, and droughts, pose a significant threat to developing states like Pakistan. These issues can intensify existing conflicts and crises faced by citizens and the state, leading to new insecurities due to inter-state and intra-state conflicts over limited resources. Pakistan, while producing only 1% of global carbon emissions, ranks among the top ten states most vulnerable to climate change and natural disasters. Rising environmental uncertainties cause displacements of people, leading to intra-state

conflict and property destruction. The country has the greatest number of glaciers outside the Arctic regions, which can cause country-wide floods and destruction.

Despite numerous policies being given throughout different time periods, Pakistan has not made much practical work on addressing environmental challenges. The national policy of Pakistan has always been political and military-centric, but it has managed to formulate some environmental strategies, which have been highly praised by international organizations. However, these strategies have failed to be implemented properly due to political crises, economic disapprovals, regime change, or being ignored by leading policy actors. The United Nations claims that Pakistan is the least contributor to global efforts related to climatic changes and environmental degradation. This article aims to highlight some major environmental policies and strategies formulated by Pakistan, but the governments have failed to implement them in practical fields to have any impact.

Pakistan's Struggle with Conventional and Renewable Sources

Pakistan, the world's fifth most populous country, is dealing with a complex "polycrisis" that includes energy shortages, political unrest, growing external debt, and the worsening effects of natural disasters linked to climate change (World Bank, 2023). Standing at 150 out of 181 countries on the Notre Dame Global Adaptation Initiative (ND-GAIN) index, the nation's complex issues are further highlighted by the fact that around 62% of its population lives in rural areas that are intimately linked to the climate-vulnerable agricultural industry (Wang, 2023).

In 2007–2008, Pakistan's main energy supply was 62.88 MTOE, of which more than 99% came from conventional energy sources such as nuclear, gas, oil, and hydel. However, less than 1% of the energy was provided by micro/mini renewable energy (RE) installations. The National Institute of Silicon Technology (NIST) was founded in 1981, the Pakistan Council of Appropriate Technology (PCAT) in 1975, and the Alternate Energy Development Board (AEDB) in 2003 by the government. AEDB and PCRET are the two primary government departments responsible for renewable

energy projects that were formed in 2001 by the merger of NIST and PCAT to become the Pakistan Council of Renewable Energy Technologies (PCRET).

The output of solar and wind energy systems and mini/micro hydropower plants combined amounted to less than 3 MW at the end of the 1990s due to a lack of precise promotion instruments for renewable energy technologies. In 1992, the Pakistan National Conservation Strategy (PNCS) was announced to introduce biogas, wind power, and mini hydropower facilities. In 1997, the National Environment Action Plan-Support Programme (NEAP-SP) was signed between the government and UNDP, aiming to generate 10% of the total installed capacity from renewable energy sources by 2015.

The disastrous floods that occurred recently in 2022, which affected 33 million people and forced 8 million to relocate, highlight the direct effects of climate change. Although Pakistan's share of global greenhouse gas emissions is only 0.88%, the country's total emissions in 2020 were 443.60 MtCO_{2e}, mostly from the energy and agricultural sectors (Ali et al., 2022). In response, Pakistan has taken a number of steps to mitigate the effects of climate change, including the National Climate Change Policy (NCCP) and the Framework for Implementation of the Climate Change Policy (2014–2030) (Masud & Khan, 2023). Though the country has demonstrated its readiness to move toward sustainable practices with recent initiatives like the Electric Vehicle Policy (2019) and the Renewable Energy Policy (2019), challenges still exist in effectively putting these policies into practice. To overcome complex challenges and seek sustainable development, Pakistan has to effectively implement these policies in addition to financial contributions and international cooperation. The Pakistani energy problem is still getting worse in spite of their efforts. The country's utilization of conventional and renewable energy sources and the implementation of renewable energy projects are discussed, along with suggestions for effective dissemination of renewable energy technologies.

Education and Communication

Pakistan has prioritized climate change in its national goals and programs, indicating the importance of this issue to the nation. Nonetheless, terms like

awareness, capacity building, education, and training are used along with climate change in several government papers, including the National Climate Change Policy (2021), National Environmental Policy (2005), and Framework for Implementation of Climate Change Policy (2014–2030) (2013). While the National Education Policy Framework (2018) places a strong emphasis on sustainable development goals, education for sustainable development, and sustainable development, the National Education Policy (2017) and National Curriculum Framework (2018) only use the term "climate change" about emerging trends. The National Education Policy Framework (2018) emphasizes enhancing the skills of education professionals, implementing strategies on important issues like environmental education, raising awareness of climate change through research and development initiatives, and increasing access to education to meet international commitments. Additionally, it establishes objectives to fortify Pakistan by increasing the country's literacy rate and the general populace's involvement in decision-making at all levels.

Pakistan is working on a Single National Curriculum that will be finished in 2023. It will emphasize values and characteristics like honesty, truthfulness, tolerance, respect, peaceful coexistence, democracy, human rights, sustainable development, global citizenship, personal hygiene, and safety. Pakistan's public and private schools will all use this curriculum. The World Bank reports that the Pakistani government spent 2.5 percent of GDP on education in 2019. The education sector spending decreased by 0.4% from 2017 to 2019. The fiscal year 2020–2021 in Pakistan saw a marginal decrease in the country's environmental budget compared to the previous year. Additionally, program financing for climate change education and awareness raising accounted for 2% of the 2013–2014 budget (The World Bank, 2023).

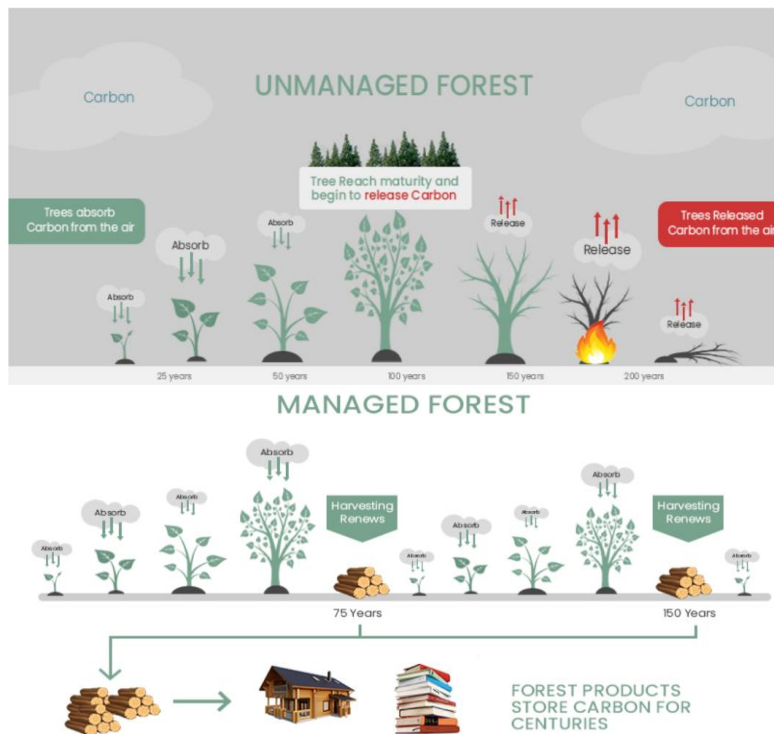
According to the 2nd National Communication (2018), Pakistan requires financing for adaptation of between \$7 billion and \$14 billion annually because there is a dearth of opportunities and investment in climate change education, as well as a shortage of competent people resources. From 2018 onward, the Green Climate Fund will provide \$35 million to improve government capacity and farmers' knowledge and abilities in climate change

adaptation, transforming the Indus Basin. In addition, the Fund has provided \$37 million for two projects centered on sustainable transportation and renewable energy to lessen the susceptibility of communities to glacial lake outburst floods, a natural hazard caused by climate change. However, there are four programs sponsored by the Global Environment Facility that do not center on teaching about climate change (Pakistan, 2018).

Pakistan's 2012 National Climate Change Policy

A significant step toward addressing climate change in Pakistan was the creation of the National Climate Change Policy in 2012 (Mumtaz, 2018). This

extensive effort sought to address climate change in several national development and planning sectors. One of the policy's notable goals was the integration of a curriculum on environmental planning and climate change, with an emphasis on disaster risk reduction, in the official education system at all levels. This project aimed to educate the future generation and lay the foundation for thinking that is climate resilient (Ahmed et al., 2020). Relevant subjects emphasizing the value of safeguarding water resources were included to school curriculum in order to put these efforts into action (Masud & Khan, 2023).



(Ahmad, 2020). <https://macropakistani.com/what-steps-has-pakistan-taken-for-climate-action/>

This proactive measure aimed to provide future experts with the knowledge and skills needed to mitigate and control climate-related disasters (Rasul & Ahmad, 2012).

Pakistan's Eco-System Restoration Initiative (ESRI)

Pakistan is among the top 10 countries most susceptible to natural disasters brought on by climate change, even though it contributes very little to

greenhouse gas emissions. During this time, 152 natural catastrophes have caused losses of almost \$3792.52 million in damages. Sustainability is

threatened by the rising frequency of these disasters, which is made worse by insufficient management and mitigating actions (Aslam, Gul, & Asghar, 2021). The creation of ESRI is a proactive measure to increase environmental sustainability and resilience in view of the mounting risks linked to climate change (Chaudhry, 2017).

Ten Billion Tree Tsunami Programme (TBTTP)

The Ten Billion Tree Tsunami Programme (TBTTP) in Pakistan is an innovative effort in the Khyber-Pakhtunkhwa region, which operated from 2013 to 2018. Federal and local forestry and climate change agencies also have an impact on the project's outcomes (Rayan, Gruehn, & Khayyam, 2021). A budget of Rs. 125.184 billion has been agreed by the Executive Committee of the National Economic Council (ECNEC) for the first phase, which aims to plant 3.29 billion plants. The program produced over 100,000 daily wage jobs and planted about 350 million trees by the end of Fiscal Year 2021 (Ehtasham et al., 2022). The TBTTP is a significant step forward for Pakistan's environmental conservation efforts, offering long-term benefits like improved air quality, less greenhouse gas emissions, and the ability to lessen the impact of natural disasters (Balzacq, Léonard, & Ruzicka, 2016).

Clean Green Pakistan

Imran Khan, the prime minister of Pakistan, launched the five-year Clean Green Pakistan (CGP) campaign with the intention of carrying out initiatives in Islamabad and instigating comparable measures at the province level. In addition to setting up a CGP secretariat in the Ministry of Climate Change and employing a CGP Manager for coordination, WaterAid Pakistan offers technical assistance for waste management and water and sanitation (WASH) components (Tribune, 2020).

Safe drinking water, solid waste management, overall sanitation and hygiene promotion, liquid waste management, and tree planting are the five pillars of the campaign design. While WASH services are entirely under the authority of the province governments to organize and carry out, CGP offers a way to enhance the sustainability and quality of services. As part of the campaign, WaterAid helps the government strategize and expands the pool of funders and supporters by

bringing in additional partners from the business and civil society sectors (Syed et al., 2022).

The campaign's political asks include developing a comprehensive behavior-centered strategy, introducing or implementing legislation/regulations associated with each clean component, and strengthening institutions and resources at each level of governance to make Pakistan an ODF country. Key activities and progress assessment include supporting the focal ministry in developing the overall strategy and five-year roadmap, providing communication and campaigning support for three campaigns, supporting the development of WASH models in Islamabad, implementing activity-based training of school children on WASH behaviors, and implementing the Clean Green campus campaign in ten universities of Islamabad (Pervaiz et al., 2019).

Citizen Engagement Program

Public participation in environmental initiatives is a significant initiative that the Pakistani government undertook under the direction of the Ministry of Climate Change. The Pakistani government has titled the program "Clean Green Champions." The goal of the program is to get individuals involved and motivated to voluntarily participate in activities related to the five pillars of the Clean Green Pakistan Index (CGPI) (Maguire, 2019). Pakistani youth in particular have shown appreciation for the program, and thus far, 120,000 volunteers have registered as champions. (Khan, 2014). The three primary categories of activities are created by MoCC, and the Green Champions (volunteers) are free to select any activity they would like to participate in:

1. The first category is devoted to self-help volunteer services in the areas of trash management, sanitation-related activities, and resolving issues with the water supply, among other areas.
2. Volunteering to assist the local government in matters pertaining to addressing complaints and difficulties raised by the public, as well as providing assistance with necessary services, falls under the second category.
3. The third category relates to aiding the government in raising public understanding of how people should behave toward the environment and how everyone's

contributions to the environment are equally necessary for the government to be able to reduce the threat level (Nadelman & Sah, 2019).

Recent Developments

Three primary objectives for the power sector were to be addressed by Pakistan's National Electricity Plan in February 2021: sustainability, energy security, and cheap energy access. The strategy placed a strong emphasis on maximizing the use of energy resources and diversifying the nation's fuel mix. Pakistan revised and submitted an updated National Development Goal (NDC) that year, pledging to reduce greenhouse gas emissions by 50% by 2030 when compared to the Basel Agreement (BAU) Marshall et al., 2021). The NDC also highlighted mitigation goals, such as putting a ban on new coal power plants, producing no electricity from imported coal, and raising the proportion of renewable energy in all electrical generation to 60% by 2030 (Mako et al., 2022, May). Pakistan committed to taking voluntary steps to cut global methane emissions by at least 30% from 2020 levels by 2030 when it joined the Global Methane Pledge at the COP26 in Glasgow, Scotland, in November 2021 (Wang, Asia Society, 2023). The National Climate Change Policy was then revised in 2022, presenting a framework for energy saving and a decrease in greenhouse gas emissions from different heavy-emitting industries. Pakistan's high reliance on imported fossil fuels exacerbated the country's energy problem in 2022, resulting in power outages and loan payments to satisfy energy demands. In order to lessen its reliance on imported fossil fuels, the Pakistani government announced framework guidelines on fast-track solar photovoltaic (PV) activities in March 2022. Nevertheless, no proposals have been received as of yet, perhaps as a result of the nation's high-risk electricity industry and political unpredictability.

Pakistan promoted the creation of a specific "loss and damage" fund at COP27 in Sharm el-Sheikh, Egypt, while serving as the G77 chair in 2022. This highlighted the critical need for financial help to confront climate catastrophes and resulted in the inclusion of loss and damage finance on the COP27 agenda for the first time. In an effort to lessen its reliance on gas imports to meet its energy demands,

Pakistan announced plans to triple its domestic coal-fired power capacity at the beginning of 2023 (Kossaify, 2023). The China-Pakistan Economic Corridor (CPEC), an ambitious multibillion-dollar project that has 90% of the nation's existing coal capacity supported by China, has been the main tool driving the country's coal boom. But because China promised to "no new coal overseas" in 2021, it is unclear how Pakistan planned to finance its coal expansion plans.

Pakistan's National Adaptation Plan (NAP), which it presented to the United Nations Framework Convention on Climate Change (UNFCCC) in August 2023, reflected the nation's priority to address climate change-related concerns, particularly in the wake of the floods in 2022 and the recurrent heat waves. The strategy highlights the critical need to secure long-term sustainable finance, involve the private sector, and bring climate financing front and center to focus development around adaptation (Wang, Asia Society, 2023).

Conclusion

Pakistan makes insufficient attempts to stop environmental damage and preserve the environment. To guarantee the safety of the environment and avoid a crisis, the nation must undertake significant labor. The Pakistani government has begun to pay attention to the environment and climate. To ensure environmental sustainability and offer citizens with environmental security and freedom, the government must invest significant time, money, and resources in environmental research and development. Pakistan's efforts, despite their delayed start, are essential to guaranteeing the future of the nation. Pakistan battles to control its debt while attempting to recover economically from floods and heat storms. To counter energy poverty and currency devaluation, significant policy adjustments are needed, with a renewed focus on developing domestic renewable energy sources among other things. In addition to solving the high cost and lack of investor interest in coal plant growth, this would promote Pakistan's National Development Goals (NDC) and help attract international financial support. Pakistan has been attempting to attract investments that are more environmentally friendly. The nation will exhibit an investment portfolio of USD 2.84 billion at the UN

Sustainable Development Goals Investment Fair in April 2023. The portfolio includes projects related to water conservation, renewable energy, and climate-resilient agriculture. The most recent IMF bailout might encourage some private investment interest in the economy, however that hasn't happened yet. In July 2023, Pakistan and Switzerland signed a bilateral cooperation agreement to collaborate on early warning systems and resistance to natural disasters, Dr. Sultan Al Jaber, the COP28 President-Designate, met with Prime Minister Shehbaz Sharif and other senior officials while in Pakistan. He stressed the need for greater cooperation and support on climate issues for developing countries that are leading the way in combating climate change during these sessions. The "caretaker" government of Pakistan is not expected to hold elections until January 2024. The UN General Assembly heard demands made by acting prime minister Anwaar-Ul-Haq Kakar to implement the Sustainable Development Goals Stimulus, increase the amount of concessional funding provided by global development banks, and address the debt issues of 59 financially distressed countries. Pakistan is expected to back the establishment of a high-level advisory council at COP28 in December in order to facilitate the effective operationalization of a robust loss and damage fund and to provide a comprehensive worldwide response to losses and damages.

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