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ENVIRONMENTAL INSECURITY IN PAKISTAN: CONTEMPORARY CHALLENGES AND RESPONSES

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ABSTRACT

This study investigates the contemporary environmental risks of air pollution and heat waves, their causes, and their impacts in Pakistan. The research aims to find out the reasons behind the response challenges despite introducing policy programs such as National Climate Change Policy Framework and initiatives like The Billion Tree Tsunami. This study has used a qualitative research approach by adding a case study analysis and an environmental expert's opinion. The key findings have revealed that compared to the past, the nature of causes behind rising air pollution and intense heat waves has changed. Heavy traffic flow, stop-and-go traffic phenomenon, uncontrolled emissions, and rapid shifts in rainfall are the principal factors that harm Pakistan's environment. From the expert's point of view, the study also reveals that the response mechanism is facing hurdles due to institutional dissonance and lack of capacity building. Further, the findings suggest that a multi-layered approach involving policymakers, experts, academicians, and individuals through a community-driven approach can offer practical solutions. As the study has included the example of an individual-level digital response to current environmental threats, this research would provide a platform to make similar budget-friendly and technology-oriented approaches in the future.

INTRODUCTION

Pakistan is an environmentally challenged country that has witnessed many disasters over the past few years. Previous studies have revealed that although environmental issues in Pakistan are not recent, they are the most triggered issues of this decade (Chakrabarty, 2012). As the country lies in a semi-arid region, it faces rapid climate change patterns and weather shifts causing intense heat waves and air pollution (Mustafa, Baig, & Straquadine, 2021). Pakistan's environmental outlook further worsened when the Global Climate Change Index ranked Pakistan at fifth highly sensitive position in the 2020 yearly report (Fahad & Wang, 2020). Also, in the view of geological experts, Pakistan's geographic design is comprised of three strikingly different zones- the Indus River Plain, the Northern Peaks, and the Plateau which make it environmentally vulnerable to disasters. The overall scenario is also facing the hurdles of institutional, governance, and administrative dissonance regularly causing delays in timely responses (Field & Baros, 2014). This paper has attempted to find the gaps in the knowledge regarding contemporary environmental concerns of air pollution and heat waves. The paper has primarily focused on the current causes, particular impacts as well as individual, institutional and technology-oriented responses catering to these risks. Also, the consultation with the country's environmental experts during this research has contributed to giving a conducive approach as a solution to these climate challenges. Being recent research, this study will provide a platform for both government and communities to look into quick solutions in relevance to the present-day scenario, help academicians and researchers in making pragmatic policy frameworks, and motivate individuals for investing in tech-savvy measures after the success of a few initiatives mentioned in the paper.

LITERATURE REVIEW

Environmental insecurity brings the risk of damaging the biodiversity levels necessary for human life along with deteriorating the basic needs to survive. This phenomenon is linked to the fears of ecological hazards directly impacting global development (Gore, Lute, Ratsimbazafy, & Rajaonson, 2016). The related challenges of food and water insecurity may also cause competition over the resources leading to future threats of offensive activism and ecological movements

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(Spadaro, 2020). In the view of ecological movements relevant to the seriousness of the environmental challenges, there is not much expressed about the contesting perceptions of Deep Green and Bright Green Environmentalism. These two schools of thought carry a debate where Deep Greens securitize the environmental concerns by highlighting the haunts of environmental threats such as endangered species and climate change patterns. On the other hand, Bright Greens focus more on positive solutions with innovations such as introducing green technologies, renewable energy setups, and recycling (Sessions, 2014). Such debates are causing hindrance in shaping the local and international governance policies. Also, recently, Covid-19 and the health crisis have greatly influenced green efforts. States and institutions have shifted their priorities toward economic and health sector recovery (Qadeer et al., 2022).

Particularly, in the case of Pakistan, environmental insecurity and climate change have a more perilous effect than in any other country present in South Asia. The reason for this is the nature of the country's economic landscape which is agrarian and forms not only 21% of the annual GDP but also contributes 43.7 percent to the employment rate (Abid, Scheffran, Schneider, & Elahi, 2019). The severity of climate risks for such a developing country multiplies due to poor management and the absence of timely warnings (Anjum et al., 2021). Thus, concurrent heat waves, the accelerated melting of glaciers, and alterations in rainfall patterns have stressed the water and food sector causing a decline in annual crop production (Khan, 2019). Further, uncontrolled population growth, massive urbanization, and brutal use of environmental assets such as rapid forest cutting are destabilizing the natural ecosystem putting pressure on air quality and weather patterns. (Khwaja & Khan, 2005).

RESEARCH METHOD

The research is a qualitative study which follows exploratory methods to find solutions and reach conclusion. The primary data was collected through personal interviews with environmental experts. Secondary data was collected from related publications such as articles and books authored by known research analysts. These include Pakistan's State Department official documents available on the official websites and archives of the Ministry of Climate Change, handbook of National Climate Change Policy 2012 and two short case-study analysis. Furthermore, the research incorporates secondary online data from the World Meteorological Department and the European Environment Agency. Finally, the analytical framework is used to make better understanding of the current scenario, find gaps and provide suitable measure for the future studies.

THEORETICAL FRAMEWORK

The Copenhagen School has remained a successful approach in the arena of international relations. After the end of the Cold War, Barry Buzan laid the foundation for the most known traditionalist versus non-traditionalist view of security debate (Buzan, 1997). Buzan sees security as a holistic notion expanded to five principal areas. According to him military might and political superiority should not be the only concerns for states to survive. Opposite to the traditional conceptualization of risks, securitization must also be viewed through the lens of societal, economic, and environmental concerns (as cited in Stone, 2009).

AIR POLLUTION IN PAKISTAN

Major Causes of Industrial Waste, Traffic, and Cross-Border Pollution from India

The World Health Organization (WHO), reveals that among all the countries, the air in India, Pakistan and Bangladesh contains the highest number of pollutants up to the levels of PM 2.5. In the case of Pakistan, the winters have seen an immense upsurge of toxicants in the air increasing the smog levels. As per the report by a well- known medical journal, The Lancet, it is evident that 22 percent of annual deaths in Pakistan are due to the extraordinary rise in air pollution, (Rehman, 2018). Air pollution is the existence of harmful substances and chemical composites of organic or inorganic nature, which are otherwise not found in the components of air and so are responsible for poisonous effects to the living beings surrounded by it (Vallero, 2014). Though Pakistan's Industry carries a small share in its economy as this country is mostly agrarian, it escalates the levels of air pollution to 40% (Sánchez, Enriquez, Afzal, Nakawaga, & Khan, 2014). From a case study analysis, the Sugar Mills in Pakistan's Punjab region are the biggest contributors to air pollution. The study showcased that 91 percent of the people living in the area know that their life is at risk due to harmful industrial waste fumes in the air. Around 83 percent of the respondents expressed that industrial smoke halts their daily life causing serious respiratory issues to them (Gull et al., 2013). The massive flow of traffic on the highways of Pakistan is the second biggest generator of air toxicants in Pakistan. The most common reason behind this is the dependence on gasoline for small cars and on diesel for heavy vehicles. Surplus release of emissions that carry hydrocarbons multiplies pollutant content. A study on the flow of heavy traffic on the major highways of Pakistan revealed that the heavy diesel engine vehicles moving on these highways generate a massive amount of nitrous oxides, ozone-depleting gas molecules, smog elements, and cancer-causing toxicants. Moreover, they are a cause of solid particulate suspension in the air as well. Another striking fact is the release of extra harmful emissions in the air by the traffic during the process of "stop and go" time of vehicles when they remain stranded in traffic jams while engine's idle (Ali & Athar, 2008). In a recent report published by the New York Times, Pakistan's higher authorities claimed a suspicion that India is to be blamed for its massive air pollution hazard. The issue was raised under the alarming situation of smog in Lahore, the second largest and most polluted city in Pakistan. Lahore shares the border with the Indian Territory and thus Pakistan's Ministry of Climate Change claims the neighboring activities as a transnational cause following the news that Delhi is the most contaminated city in the world. The most probable reason could be the burning of crops by bordering Indian farmers causing the polluted air to travel into Pakistan triggering Lahore's smog. However, this is seen as mere blame by the citizens of Lahore who consider ignorance of the political authorities as a major reason behind this challenge. Resultantly, the citizens have asked for more active and less verbal measures from the government (Habib & Masood, 2019).

Case Study of Lahore

Lahore is the second largest city in Pakistan and is currently suffering from high-level air pollution hazards. This fact gained attention after the 2017 publication of Lahore's Air Quality Index. This AQI was generated by the informal efforts of the citizens and expressed that the air pollution levels in Lahore reach their extreme levels, especially in the winter when farmers close to the areas of Lahore do heavy combustion of wasted crops which converts directly into smog. Following the same trend, November 2019 came out to be the smoggiest month in Lahore compared to the same season in previous years (Tabinda et al., 2019).

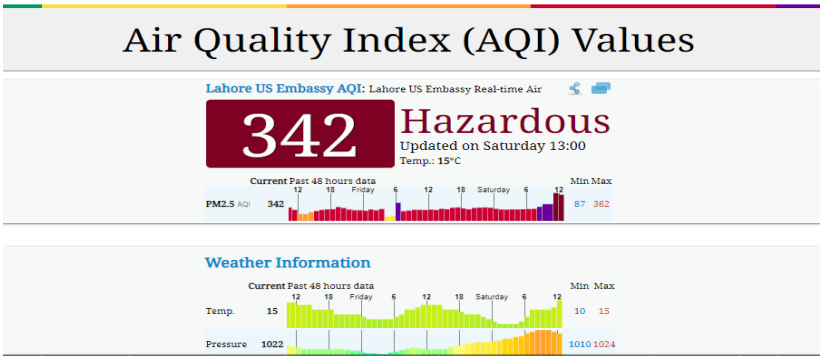

Figure 1. Air Quality Index Values
Source: IQAir, 2022

Other factors contributing to air pollution in Lahore are emissions from vehicles, brick kiln combustion, and general waste from homes. As a result, Lahore also topped the list of the most polluted cities in the air quality report with PM 2.5 waste residue suspended in its air. Observing the highly unfavorable concerns on air pollution, a young entrepreneur developed a mechanism for checking air quality by starting the Pakistan Air Quality Initiative (Omer, 2018). This step was based on gathering the real-time air quality check for the citizens through the use of a digital application to ensure awareness and timely control measures.

Impacts

Pakistan has an agricultural landscape and air pollution causes maximum damage to its crops especially wheat production leading to food insecurity. Rice and wheat fields make the two most important staple crops for consumption in Pakistan. A study reveals that a heavy loss of around 42 percent in rice and winter wheat production in Pakistan is witnessed due to the harm caused by polluted air over the fields (Devrajani, Qureshi, Imran, & Nisa, 2020). Air pollution is harming the rainfall patterns too, which has a direct impact on crop harvesting seasons. This hazard has continued to bring health risks for the citizens of Pakistan most notably the declining life expectancy rate among children and increased cases of diseases like cancer, bronchitis and asthma (Shi, Bilal, Ho, & Omar, 2020).

HEAT WAVES IN PAKISTAN

According to a report by CNN, the menace of heat waves took the life of 65 people last year in Karachi. This happened because of the drastic rise in temperature during the month of May from 35 degrees Celsius to 44 degrees Celsius coupled with heat blow (Saifi & McKirdy, 2015). A heat wave refers to a span when the earth's weather experiences an extremely hot temperature along with rising humidity levels (Robinson, 2001). The reason behind this horrendous heat blow was the dry year due to the imbalanced shift of the monsoon season. The strongest heat wave in Pakistan which reached an extreme temperature and grabbed global attention was the heat wave of 2015. This heat wave expanded over the sub-continent covering the Indian land as well. This heat wave spelled over April, May, and June and left approximately 2500 people in Pakistan and around 1100 in India dead (Masood, Majid, Sohail, Zia, & Raza, 2015).

Heat Index	Health Effects
27°C – 32°C (300.15 - 305.15 K)	Fatigue possible with prolonged exposure and/or physical activity.
32 – 41 °C (305.15 - 314.15 K)	Heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
41 – 54 °C (314.15 - 327.15K)	Heat cramps or heat exhaustion likely and heatstroke possible with prolonged exposure and/or physical activity.
> 54 °C >327.15 K or higher	Heatstroke highly likely with continued exposure.

Figure 2. Heat Index and Impacts
Source: Zahid & Rasul, 2010

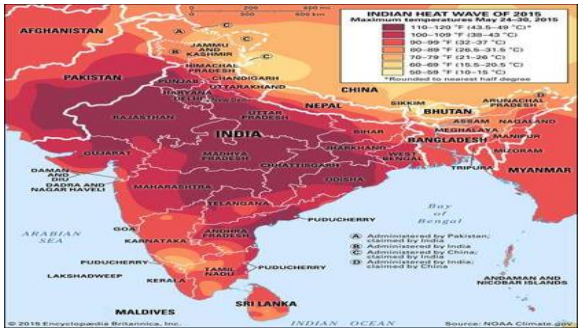

Figure 3. Map Showing 2017 Heat Wave
Source: Khan, Shahid, Ismail, Ahmed, & Nawaz, 2019

The heat wave of 2017 started a month earlier in April with temperatures rising to 51 degrees Celsius and expanding over the southern parts of Pakistan. This was the first time in the history of the country that the April temperature went that high. The most affected cities by this heat wave were Larkana, Sibi, and Mohenjo Daro in the Sindh province, and Lahore in the province of Punjab. This heat wave was disastrous for the wheat and rice crops of Pakistan as well. The third heat wave of this scale was recorded in the summer of 2019.It expanded from May to June 2019 and hit the boundaries of India and Pakistan similar to the heat wave back in 2015. The hottest temperatures during this period reached the heights of 50-52 degrees Celsius in the cities of Churu, Rajasthan and Bihar of India, and Larkana, Sibi, and Multan in Pakistan. Strikingly, this heat wave remained for 32 consecutive days, the longest recorded to date (Khan, Shahid, Ismail, Ahmed, & Nawaz, 2019).

Impacts

The impact of the heat waves is more authentic if they are supported by the Heat Index, a scale calculating the temperature increase and rise in moisture in the layers of earth's atmosphere (Delworth, Mahlman, & Knutson, 1999). In the case of Pakistan, the Heat Index displayed sensitivity levels to the various health conditions of the people living in the heat wave-affected areas. The most common impacts recorded are heat stroke, heat fever, sunburn, nausea, and heat collapse leading to paralysis or even death (Rasul & Ahmad, 2012).

ENVIRONMENTAL POLICY AND ACTION FRAMEWORK IN PAKISTAN

A Viewpoint of the Environmental Expert

The National Climate Change Policy of Pakistan was prepared after the heavy flooding of 2011 and was subsequently published in 2012 by Ministry of Climate Change Pakistan. This was the most formidable step toward identification and policy measures on environmental protection in Pakistan. This policy proved as an indicator that Pakistan contributes minimally to the release of greenhouse gases and focuses considerably on the legislative framework and clean technology programs (Mumtaz, 2018). In a personal interview with one of the known environmentalists and activists of Pakistan, Dr. Ghulam Rasul, a great deal of information was collected on the different phases and progress of the environment sector in Pakistan. Quoting the latest information on environmental security perspective, he shared that Pakistan currently stands in seventh place as the most vulnerable country to be affected by climate change as it faces challenges like heatwaves, melting glaciers, air pollution, and smog. The history of policy response to environmental problems in the post-independence period can be divided into four phases-environmental neglect (1947-1957), period of ad-hocism (1958-1973), institutional and legislative policy making (1972-2000), and environmental monitoring (2000-till now) (G. Rasul, Personal Interview, January 18, 2021). The action framework accelerated with Pakistan's Prime Minister Mr. Imran Khan's speech at the UN Assembly session in 2019 where he brought immense global attention to global climate change (Qazi, 2019). The government has also shaped the programs such as the Billion Tree Tsunami and Clean Green Environment Program to handle the risks of extreme temperature rise and elevated air pollution (Hussain et al., 2020).

ANALYSIS

Pakistan is a developing country and so there is a contention between funds generation and allocation to the respective environmental sectors. There is a huge gap regarding information transparency among the various institutions bringing hurdles to working coherently for environmental protection. This leads to a lack of vision and proper clarity over the seriousness of the issue. The Pakistani government as well as local and international bodies working for environmental conservation are deficient in the capacity of creating short-term goals and rely more upon long-term policies. Even if a short-term goal is made, there is a lack of time to check on it which later on becomes a delay excuse challenging the timely response mechanism. Also, during the time of a national calamity, all the local and international environmental bodies become active and announce several programs but at the time of no big disaster, the pace of such activities slows down, where funds are stopped and the action framework becomes dormant. To handle this situation, there is a need to have a persistent and multi-level approach by targeting the issues at a grass-root level. Further, individual-level capacity building can be a big step towards having timely and responsible solutions.

CONCLUSION

The recent environmental issues of air pollution and heat waves had the strongest impact to the country's landscape and economy in comparison to the past, subsequently resulting in the highest level of harm. Pakistan's industry sector, heavy traffic flow, and especially the stop and go traffic phenomenon have escalated the amount of particulate matter in the air causing a historical increase in smog levels. In addition, Pakistan has witnessed repeated heat blows since 2015 due to irregular monsoon patterns and aberrant urbanization. These heat waves have taken the lives of many and causing a huge economic loss. This research has revealed that despite the extreme seriousness of rapid environmental degradation, the authorities in Pakistan have expressed very limited concern making it a part of low politics. Although the announcement of policies like the Green Clean Program, National Conservation Strategy and The Billion Tree Tsunami have made a difference, the action mechanism still faces the institutional discord. The research includes the viewpoints of environmental experts according to whom Pakistan is suffering through a multifaceted environmental concern which requires a solution with a multi-layered approach involving policymakers, experts, academicians, and individuals through a community-driven approach. The research provides information about the lack of capacity building, management, planning, and technical expertise in finding possible solutions. These findings could set the stage for introducing new budget-friendly technological solutions to curb concerns of pollution and rising temperatures.

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