

RESEARCH ARTICLE

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World Climate Change and Its Impact on the Citizens of Nankana Sahib: The Role of District Administration in the Birthplace of Guru Nanak Dev J

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Abstract:

This research, world climate change Impact on the Citizens of Pakistan narrates about the health issues. Climate change is recognized as one of the most significant threats to global public health in the 21st century. Rising global temperatures, shifting weather patterns, extreme heatwaves, floods, droughts and the degradation of air and water quality have direct or indirect effects on human health. This study will add as a case study of Nankana Sahib (Birthplace of Guru Nanak Dev J. Where environmental degradation and urban challenges have been worsening the health of local people. It also underscores the increasing threats to the city's historical and religious heritage, which attracts thousands of pilgrims annually, placing additional stress on the region's environmental resources and public services. Therefore, the study will investigate the situation of climate change Nankana sahib Punjab (Pakistan) and its impact on the older as well as kids in the city. This research aims to identify sources of climate change to assess the impacts on the health of elderly and kids also investigate the current policies and processes regarding health. It suggests ways to reduce climate change impacts on elderly and kids' citizens under the thematic analysis after data Collection of Primary and Secondary sources.

Key words: Climate Change, Global, Pakistan, Nankana Sahib, District Administration.

Introduction:

Climate Change in Global Perspectives

Climate change serves as a obvious notice of the complex and often adversarial relationship in between nature and humanity. Human advancement has historically been driven by the conquest and transformation of natural environments.

The escalation of global heating, rising sea levels and extreme weather conditions are not random natural incidences but rather reactions to human induced interferences in the Earth's climatic balance (IPCC, 2021). In this context, nature appears to be “playing back” by demonstrating the outcomes of industrial pollution, deforestation, and overconsumption. These dynamics reveal a profound irony in mankind's efforts to dominate nature have ultimately led to vulnerabilities that nature exploits through increasingly severe climate related impacts.

Climate change has shown that humans do not have full control over nature. Disasters like floods, droughts and heatwaves not only harm the environment but also affect people’s health daily lives, jobs, communities or daily life system. Poorer communities, especially in developing countries, suffer the most from these problems. There are certain ways to play nature, the effects of climate change are important to take fair and urgent action to protect everyone (UNEP, 2022). Thus, nature’s response for human beings or harm can be interpreted as a form of rebalancing or warning.

So, the climate change is projected to significantly raise the global incidence of diarrheal diseases, which remain a leading cause of death among children. Human had consistently linked various climatic conditions particularly rising temperatures to an increased risk of diarrhea. For instance, a time series study analyzing daily hospital admissions revealed that for every 1°C rise in temperature, diarrhea cases increased by 8%. Another major climate sensitive disease is cholera, a highly infectious illness transmitted through the consumption of contaminated food and water. with its spread closely tied to environmental conditions and exposure levels (Kinney, 2008) Ongoing interaction emphasizes the necessity of sustainable development and reinforces the

principle that human beings is intimately linked to the health systems of the a natural world (Gue & Elizabeth, 2017).

Climate change has proved to be a significant global problem that has dominated the globe due to its disastrous ramifications. The phenomenon has exceeded all the limits and threatened several islands and triggered global movements of people. Recognized as a major threat, climate change has now emerged as one of the most pressing matters of international issues and diplomacy. Not a single country is safe from this severe threat and Pakistan is also one of them (Waheed, Bernward Fischer & Khan, 2021)

Pakistan has faced floods shortage in 2007 due to the heavy rain systems and flood that exposed its vulnerability. The 2010 Pakistan floods were among the worst in history, affecting 20 million people. Pakistan approved the Paris Agreement to reduce greenhouse gas emissions in 2016. Climate change remains a serious threat to Pakistan's economy, food security and human settlements as well as globally same threats appears. Pakistan's climate vulnerability has emerged as a pressing concern in global politics. Overall, the politicization of climate change by developed countries has hindered global efforts at addressing the crisis. The United States and European countries have been responsible for emitting the most greenhouse gas emissions in history. Under developing countries like Pakistan have procured upsetting due to climate effects include rising sea levels, extreme floods and droughts. They bear the cost without making a minimal contribution in terms of global emissions. Climate politics have unfairly distributed the burden on poor developing nations (Kopra, 2018).

Pakistan and Climate Vulnerability

Climate change severely affects Pakistan's economy, security, and livelihoods. Glaciers melting due to rising temperatures affect water resources. Floods and droughts cause disaster to agricultural or food security. Rising sea levels threaten coastal communities and infrastructure. Water scarcity and heatwaves enhance health issues. Climate migration and displacement strain urban resources. Pakistan's vulnerability to climate change is compounded by its limited capacity to adapt and respond. The political geography surrounding the location of Pakistan, touching both India, China and Afghanistan, makes things a bit complex in relation to climate diplomacy (Ghafoor & Nawaz, 2020).

Climate change impacts are closely related to Pakistan's rural communities and the traditional forms of livelihood under threat. Climate changes can lead to diseases, social unrest, migration and even cultural disruption. Cultural heritage and the promotion of climate resilient livelihoods would be essential elements in Pakistan for social cohesion (Sheer, Shouping & Sidra, 2019).

Moreover, Climate change is forcing human migration and displacement in Pakistan, especially in rural areas. Almost 20 million people were displaced in the 2010 floods. Climate migration will keep accelerating, which means more pressure on urban resources and infrastructure. Health impacts related to climate change like lungs, kidney, Diabetes, respiratory diseases and vector-borne (malaria, dengue, yellow fever) illnesses also have a huge impact on the health sector. Economic and health costs of climate change are likely to increase further and exacerbate existing development challenges. Warming allows the growth of malaria and dengue fever cases and water-borne diseases because of extreme weather conditions. It impacts mental health too, mainly for the vulnerable group (Fahad & Wang, 2020).

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Climate change in Nankana Sahib and role of district administration

Nankana sahib is a city in Punjab Pakistan, A birthplace of Guru Nanak dev ji, which is facing serious air pollution, especially during winter. The toxic gas and black carbon fall in the air over the city. The climate change is a result of Industrial production, Harmful substances released by vehicles and crop burning from surrounding rural areas. The greatest risk is found with older individuals over 50 years of age and the kids of their body defenses are compromised and also suffered from other illnesses. They included the various factors that account for the reason of cardiovascular disease, heart disease, coronary heart disease, diabetes, kidney and respiratory Illness (Ullah & Zubair, 2021).

Climate change has emerged as a pressing global challenge with direct and indirect impacts on human health. In the context of Nankana Sahib, a district in Punjab, Pakistan. Rising temperatures, increased frequency of heatwaves, irregular rainfall patterns and deteriorating air quality have contributed significantly to health related issues. The agricultural nature of the region makes its citizens vulnerable to climate sensitive diseases including heat-related illnesses, vector borne infections such as dengue and malaria and waterborne diseases due to flooding and contaminated drinking water (Watts et al., 2018). Furthermore, increased exposure to ultraviolet radiation due to ozone layer depletion is linked to higher risks of skin cancers and eye problems, particularly among those working outdoors.

Air pollution, exacerbated by vehicular emissions, crop residue burning, and industrial activities in nearby urban centers like Lahore and Faisalabad has further intensified respiratory conditions in Nankana Sahib. Citizens frequently report cases of asthma, chronic bronchitis and other pulmonary diseases, particularly among the elderly and children (Iqbal et al., 2020). These health impacts are compounded by a lack of adequate healthcare infrastructure and limited public awareness regarding climate adaptation strategies. The prevalence of smog during the winter months leads to increased hospital admissions and loss of productivity further straining local health system.

WHO has already been identified about air pollution is one of the leading environmental risks to the health of human because over 7 million deaths annually to related health problems, including neurological, cardiovascular or lungs and kidney problems (WHO, 2023). There is a complex relationship between climate change and health outcomes. Air pollution comprises both naturally occurring substances and those emitted through human activities.

Climate change is also amplifying the frequency, intensity, and duration of extreme weather events. Since 1960, the incidence of heat waves has tripled in regions. There has been a notable rise in hospital admissions for respiratory and cardiovascular conditions, as well as increased cases of skin infections, urinary tract infections, lungs, kidney and diabetes. Furthermore, temperature fluctuations have been linked to a broader spectrum of health challenges, including under nutrition, infectious diseases, and mental health disorders (IPCC, 2023). Mental health challenges are emerging as a hidden consequence of climate disasters. Displacement due to

floods or crop failures, food insecurity or economic instability are associated with anxiety, depression and post-traumatic stress among the rural population (Palinkas & Wong, 2020). As climate change intensifies, its health burden will disproportionately affect marginalized communities in Nankana Sahib who lack the resources to adapt. There is a critical need for integrated climate health policies, community-based adaptation programs, and early warning systems to protect public health in this vulnerable district (Singh, 2023)

In this way, focusing on Nankana Sahib Study explains how the issues of climate change are intertwined with the citizen's health local systems of governance, specific policies and the economy in short. It also reveals how do the policies get implemented? The study will evaluate the following question:

- Understand the global context of climate change and its specific manifestations in Pakistan.
- Analyze the health impacts of climate change in the people of Nankana Sahib.
- Explore the socio-economic vulnerabilities of the citizens of Nankana Sahib due to climate shifts.
- Examine the role and response of the district administration in climate adaptation and disaster risk reduction.
- Appreciate the cultural and spiritual significance of Nankana Sahib in the context of environmental protection Global crisis of the 21st century

Literature Review

Iqbal, H., (2016) Climate change is, to some extent, an existential threat to Pakistan, but it sends out next to nothing in terms of carbon, and this is because of the excessive consumption of resources on the part of global elites. This is a highly devastating social, political and economic reality for Pakistan. However, existing responses are not effective enough because there are gaps in lack of recognition as a serious threat, insufficient funding, failure to prioritize climate security, uneven focus on national security and limited global awareness. The defects shall be filled by transformative actions. These include a shift towards renewable energy, climate resilience policies and sound water management, achieving the goals set in the Paris Agreement, enlightenment of

global elites, and climate justice for vulnerable countries. The areas of a cities such as Lahore, Nankana Sahib, where the industries are rapidly increasing that contaminate the soil and the water.

Fahad & Wang (2020) observes that the environmental rights for further climate justice have been thrived significantly. Especially in developing countries the situation is more worsen. For example in Pakistan, it is highly weak to serious climatic shock wave due to the environmental degradation and for a host of health crises. The Study suggests that climate change worsens the heath life of poor people and marginalized communities and health its victims. The role of such environmental attentions is clear that how woefully those policies are ineffectually implemented and imposed.

Rasul & Ahmad (2012) Today, Climate change is increasingly recognized not only as an environmental crisis but as a multifaceted global health issue and political problems. Climate change politics encompass complex interactions among the countries. Where geopolitical interests, economic goals and social pressures converge is seen. So the study highlights how international climate discussions often reflect wider political conflicts. In this context that the developing world one of the largest emitters that demands the equal rights and resource utilization against climate effects. Smith revealed that the climate change is indeed a politicize phenomenon that brought about by factors such as reliance on fossil fuel sources.

Shouping, L. (2019) Climate change is elaborated a network of international environmental laws, contracts and agreements to combat global warming. These laws are preserve biodiversity and support sustainable development in world. The United Nations Agenda for Resolution on Climate Change (UNFCCC) considered as act as the legal underpinning of these efforts in the world. That has been researched by the scholars and their roles in coordinating global climate challenges and actions while keeping in view either national interests or global responsibilities. So the tension consequently represents the insistent struggle towards the creation of effectiveness, comprehensive and practical international environmental law.

Siddique, I. (2022) Climate change poses an important danger to Pakistan, which increases the risks of disasters, aggravates economic uncertainty and insecurity, increases famine and generates social anarchy. There are specific interests attached to agricultural economies and the population's health system or lifestyle. Gaps exist in extant research, such as a serious dearth of empirical

studies using contemporary data, sparse comparative study, no theory framework as applied and weak relevant policy response. To bridge the gaps, the study intends to conduct empirical research by using the latest available data, comparative analysis, development of a theoretical framework, qualitative/quantitative methods, analysis of earlier policies and evidence-based adaptations through stakeholder engagement from grassroots to policy levels, informing effective policy measures to mitigate climate change impacts in Pakistan.

This special issue explores domestic and international climate policy, with a focus on institutions, interest and networks as drivers of outcomes. It addresses proportionality in policy and under/overreactions. Importantly, the literature has not conducted comparative analyses on climate policy proportionality and impact of institutions, interests, and networks. To fill this gap, future research should apply comparative analyses and develop proportionality frameworks, integrating institutional, interest based, and network perspectives to balance policy benefits and costs (Ciechanowicz & Nyka, 2010).

Research Methodology

A qualitative approach has been taken to analyze the implications of climate change on world especially on the human's health challenges regarding Pakistan and its cities like (Nankana Sahib). This study has relied more on primary as well as secondary sources, such as reports, academic articles, policy papers, and government documents. Case study analysis of Pakistan's experiences with climate change has been conducted. Thematic and content analysis has been used to analyze data. The study aims to answer research questions on the implications of climate change on world politics and Pakistan's experiences especially Nankana Sahib the birth Place of Guru Nanak Dev ji. It has provided a comprehensive understanding of the challenges and opportunities arising from climate change for Pakistan. Relevant data has been collected from reputable sources, ensuring the validity and reliability of the study.

Analyzing Climate change

Climate change describes a shift in global temperatures and weather patterns. While natural factors like changes in solar activity influenced the climate in the past. The current trend of rapid warming temperature, melting glaciers and extreme weather events, all of which pose serious risks to ecosystems and human life mainly because of the burning of fossil fuels (Louis & Hess, 2008).

Fossil fuels and gas releases gases into the air that trap the sun's heat and warm the Earth, like a blanket. The main gases causing this problem are carbon dioxide and methane. Driving cars, heating buildings, and cutting down trees all release carbon dioxide. Farming and oil or gas work also release methane. Big sources of these gases include energy production, industry, transport, buildings, farming and land use. Climate change is happening now is one of the biggest threats to all of us.

The main gases are causing this problem like carbon dioxide. Driving cars, heating buildings and cutting down trees all release carbon dioxide. Big sources of these gases include energy production, industry, transport, buildings, farming, and land use, climate change is happening now one of the biggest threats to all of us. It must act together quickly to reduce emissions and protect our future (Lemmin & Amouroux, 2013).

These changes in the environment put pressure on food and water resources that is main cause to increase the diseases and deepen social and economic inequalities around the world. Climate change stands as one of the greatest challenges of our era. In Pakistan, it has worsened both environmental problems and social hardships, affecting millions of lives and health system. Day by day climate change making the cities like (Nankana sahib the birth place of Gru Nanak Dev Ji) are being more vulnerable to extreme weather and environment hazards (Ali, Shaikh, Sethi & Surani, 2024).

Climate Change impacts human health/ elderly and kids. (Diseases)

Climate change greatly influences the spread and intensity of many diseases, particularly those affected by temperature, humidity and water supply. Rising global temperatures and changing weather patterns create ideal conditions for the transmission of illnesses like malaria, dengue, and respiratory diseases. Warm climates enable disease carrying insects such as mosquitoes and ticks to survive in new areas, exposing populations that were previously not at risk to these infections. As a result, communities around the world especially in vulnerable and low resource regions are facing increased threats to their health due to the shifting patterns of climate sensitive diseases (Watts et al., 2018).

Climate change is primarily caused by human activities and this impact is often described as playing with nature and now the nature and nature is playing with the human. This warming

leads to various changes in weather patterns and other environmental impacts that are now significantly affecting human societies. The phrase "playing with nature" highlights the idea that human activities have disrupted the natural balance of climate system in Nankana Sahib. The consequences of this disruption are now being felt through more extreme weather. Scientists agree that human actions are the primary cause of these changes and that mitigating climate change requires significant changes in human behavior and a global effort to reduce greenhouse gas emissions (World Health Organization, 1987).

Greenhouse gases, such as carbon dioxide, methane and nitrous oxide, play a key role in regulating the Earth's temperature by absorbing some of the infrared radiation emitted from the planet's surface. Instead of allowing this heat to escape into space, these gases trap it within the lower atmosphere, creating a "greenhouse effect. The natural process helps keep the Earth warm enough for people, animals, and plants to live. On the other hand human activities especially burning coal, oil and cutting down forests have added too many greenhouse gases to the air. That traps more heat, causing global warming. As a result, temperatures are rising, glaciers are melting, sea levels are going up and extreme weather like floods, storms, heatwaves are happening more often around the world to cause of diseases (Jacob & Winner, 2009).

Cultural Tourism under Threat

Nankana Sahib, the birthplace of Guru Nanak Dev Ji, holds immense religious and cultural significance for Sikhs worldwide, attracting thousands of pilgrims and cultural tourists annually. However, the escalating impacts of climate change such as rising temperatures, irregular rainfall, and extreme weather events pose a growing threat to the sustainability of cultural tourism in the region. Heatwaves and poor air quality, often intensified by smog, reduce the comfort and safety of visitors, discouraging tourism activities during peak seasons. Additionally, the degradation of natural landscapes and infrastructure caused by environmental stress weakens the overall tourist experience, potentially diminishing the area's attractiveness as a spiritual and cultural destination (Ali et al., 2022

Climate change affects the preservation of historical and religious sites in Nankana Sahib. Unpredictable weather patterns, heavy monsoons and increased humidity contribute to the physical deterioration of heritage structures, threatening their long term viability. This deterioration not

only endangers sacred monuments but also impacts the local economy, which relies heavily on religious tourism for livelihoods and business. Without proactive climate adaptation strategies, the cultural tourism sector in Nankana Sahib could suffer irreversible damage, undermining both heritage conservation and community development. It is crucial for local authorities and policymakers to implement sustainable tourism practices, climate resilient infrastructure to safeguard this spiritually significant region for future generations (Khan & Ahmad, 2023)

Climate resilient policies

Climate resilient policies are essential strategies designed to help societies anticipate, absorb and adapt to the adverse impacts of climate change, while promoting sustainable development. These policies integrate climate risk assessments into planning processes at all levels local, national and global to reduce vulnerability and build adaptive capacity in both human and natural systems. Key components include disaster risk reduction, infrastructure resilience, early warning systems, water resource management and climate-smart agriculture. For developing countries like Pakistan, where climate induced hazards such as floods, droughts, and heatwaves are becoming more frequent, climate resilient policies play a vital role in protecting lives, ecosystems and economic stability (IPCC, 2022)

So, climate change has posed a broader threat to human health by exacerbating existing health conditions and straining healthcare systems, rising heat levels contribute to respiratory and cardiovascular stress, air pollution often worsened by climate change and triggers asthma and chronic lung conditions in human bodies. Climate change troubles to food production and clean water access for human beings and lead to starvation or digestive diseases in human bodies. It has impacted on the mental health of elders or disaster trauma face anxiety, depression. These consistent effects determine the serious need for global climate actions and the combination of climate resilience into public health planning system (Watts et al., 2018).

The role of the district administration in responding to these challenges through strategic planning, emergency management, and community engagement. It highlights efforts such as disaster preparedness, water resource management, climate awareness campaigns, and infrastructure development aimed at reducing environmental risk (McMichael, 2013). The integration of environmental ethics from the teachings of Guru Nanak Dev Ji serves as a unique and powerful catalyst for community participation in sustainability and resilience efforts.

Climate change is a huge challenge for Pakistan's economic stability, environmental sustainability and social cohesion. Pakistan has to address the challenge through multi approaches. Divergence of energy, climate resilient agriculture and improvement of disaster risk reduction frameworks must be done. Climate education and awareness, international cooperation and green infrastructure investments are important. It will require strong institutions, good governance and coordination to implement the same. Pakistan should focus on climate smart water management to advocate for climate justice in the global scenario. The above will make Pakistan a climate resilient and sustainable state, addressing climate change can save people, economies and the environment in Pakistan. This discussion conclude attempt to cast a nuanced light upon how climate change and health issue merge in Pakistan's situation in Global scenario (Keohane, 2015)

Conclusion:

Climate change is a critical health risk in Pakistan especially Nankana sahib through heat stress, respiratory conditions and vector-borne illnesses. Warmer temperatures promote the spread of malaria and dengue fever while extreme weather events lead to diseases (WHO, 2018). Climate change also affects mental health, especially in vulnerable groups. Most importantly, Climate change affects Pakistan's energy sector. The increased temperatures also raise the demand for energy for cooling, straining the national grid. Resilient infrastructure in the climate will help mitigate these impacts. Climate change impacts Pakistan's social fabric, particularly in rural areas where traditional livelihoods are threatened the health and daily life. Climate related stressors can lead to social unrest, migration and cultural disruption. Preserving cultural heritage and promoting climate resilient livelihoods and health of people are essential for Pakistan's social cohesion. These challenges threaten not only the livelihoods and health of local populations but also the cultural integrity of religious sites. In this perspective, we can reduce vulnerability in Pakistan and other developing countries to climate change. This demands concerted or sustained efforts by governments, international organizations and civil societies.

Recommendations:

The study recommending about the formulation of policies, strategies, promotion of green infrastructure to safeguard the heritage sites through climate-resilient planning. Nankana Sahib is serving as a critical case study by demonstrating about the local governance, cultural values and environmental hazards. That can collectively strengthen resilience in the face of global climate change.

The study offers some helpful strategies and recommendation:

1. Government of Pakistan should implant the environmental protection strategies at the top of the policies and frameworks to counter rapid environmental deprivation and challenges facing by Pakistan and Nankana sahib.
2. To encounter rapid environmental hazards it is important to address this links to develop local policies along with measures to alleviate the health risks posed by metal pollution in Nankana Sahib City.
3. Developed countries can play a vital role in supporting developing countries like Pakistan by providing financial assistance and transferring climate-friendly technologies.
4. The government needs to support in education and climate awareness through initiatives such as developing climate knowledge curricula, conducting mass awareness programs literacy programs. UNESCO is cooperating with Pakistan on climate education promotion.
5. Pakistan has developed countries like support through strong climate change governance. Pakistan can be helped by its friends in developing the country's climate policies, laws, and institutions.
6. Education and climate awareness through initiatives such as developing climate knowledge curricula, conducting mass awareness programs, and literacy programs. UNESCO is cooperating with Pakistan to aware people about climate change.
7. Cooperation with and diplomacy of the rich country is of highest priority to solve this global issue.
8. By adopting all these stringent measures, developed countries could help play a crucial role to assist Pakistan, and other developing countries, with respect to tackling the challenges posed by climate change.
9. It is essential to effectively address the challenges posed by climate change in Nankana Sahib the revered birthplace of Guru Nanak Dev Ji
10. The district administration should adopt climate-resilient policies to tailor to the region's unique socio-cultural and environmental context.
11. Another solution is to collaborate with environmental experts and provincial authorities is vital to integrate green technologies, reforestation programs, and climate-adaptive urban planning into local development.

12. Religious tourism centered on Guru Nanak Dev Ji's birthplace must be managed sustainably to prevent environmental degradation and promote responsible travel practices.
13. These above mentioned measures will not only safeguard the health of the citizens but also reserve the blessedness of this sacred heritage site.

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