

Climate Change and Town Planning: An Anthropological Assessment of Urban Morphology



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Abstract: *The title of the research is Climate Change and Town Planning: An Anthropological Assessment of Urban Morphology. Climate change has a significant impact on urban systems all over the world. Even said, it may be possible for humanity to work together to decrease the severity of these effects. Particularly in Islamabad, Pakistan, the population they sustain, the services they provide, and urban systems as a whole will all be significantly impacted by this. Our understanding of how to modify the urban design to accommodate climate change is the primary driving force behind this study. By highlighting the role that institutions play in the process of integrating climate change considerations into urban planning decisions and practices, the study aims to advance knowledge. Altering fuel and energy consumption patterns also has an impact on how much pollution produced by human settlements. The researcher will gather qualitative data from participants. An interview guide and a self-administered questionnaire will be used as a tool for data collection. In addition, field observation will also be utilized as a method and source of data collection. This study will investigate issues/challenges in which tools like urban planning regimes around the globe have access to and use plan-making, stakeholder interaction, development management, and design standards. The results of the key informant interviews are in line with both the current urban environment and the master plan to promote a healthy built environment. Informants emphasize that lack of resources; Infrastructure Development and low awareness of climate resilience are the main obstacles to putting sustainable urban planning into exercise.*

Keywords: Climate Change, Town Planning, Anthropological assessment, Urban Morphology

Introduction

The recent shifts in climate, resulting in various crises, are paralleled in human history due to their rapid pace, vast scale, global reach and human origins. The extensive social, economic, cultural and environmental losses, along with the depletion of natural resources are evident worldwide. These impacts have significantly increased human suffering and disrupted natural landscapes. However, throughout humanity's approximately 300,000-year history, regional and even global climates have experienced

significant and often sudden changes. For a considerable time, experts in anthropology, sociology, archeology, economics, genetics, geography and history have been investigating how these climatic shifts have influenced communities and cultures (UNDP, 2022).

Changing precipitation patterns and the rising frequency of extreme weather events due to climate change adversely affect food security and livelihood, drive displacement and contribute to land degradation. The impacts of climate change on various communities and

nations include increased average temperatures, heat waves, prolonged periods of intense heat, cyclones, typhoons and altered rainfall patterns. These climatic shifts can influence human health, agriculture, water, resources and ecosystems. The changes in precipitation patterns caused by climate change are likely to lead to more frequent and severe extreme weather events such as hurricanes, storms, floods and droughts. These events can affect ecosystems, agriculture, infrastructure and water availability. The socioeconomic implications are significant, potentially impacting public health, agriculture, aquaculture, energy production and tourism. Vulnerable populations, including the impoverished marginalized communities and indigenous peoples, are often disproportionately affected by these changes (World bank, 2019).

As Pakistan is among the top nine countries most at risk from climate disasters. Historically, Earth's climate has undergone natural warming and cooling cycles, as indicated by changes in water and air temperatures. Today, it is undeniable that the climate is changing, with clear evidence all around us. This includes global sea level rise, erratic and frequent precipitation, flash floods, extended droughts, glaciers melting, hurricanes, intense dust storms and both dry and cold spells as well as tropical cyclones.

Anthropogenic impacts such as population growth, rapid industrialization, increased reliance on fossil fuels for transportation and industry deforestation for agriculture, unplanned urbanization and a surge in energy consumption have profound effects on the environment. These activities contribute significantly to global warming, leading to a higher frequency and intensity of extreme weather events. As a result, we are witnessing more frequent flooding, prolonged droughts, soil erosion and landslides. Additionally, global warming is causing sea levels to rise, creating erratic precipitation patterns and accelerating the melting of sea ice and glaciers. These observations align with findings from the United Nations Office for Disaster Risk Reduction (UNISDR, 2015).

Strict urban planning is urgently required in

Pakistan to tackle these challenges and provide citizens with sustainable living environments. It examines the impacts of climate change and proposes practical solutions for the current urban planning issues in Pakistan. This specialized practice assists urban leaders in utilizing space as a crucial resource for development, involving diverse stakeholders to transform a vision of sustainable development into reality. This approach typically shapes the overall spatial structure of a city or metropolitan area, operating on that scale. Effective urban planning sets medium and long-term goals that harmonize a shared vision with the efficient allocation of resources needed to achieve it. By guiding investments in services and infrastructure and balancing the needs of environmental conservation and growth, it optimizes municipal budgets. Ideally, it fosters equitable economic development across cities to achieve broader societal goals (UN-HABITAT, 2013).

Pakistan is highly susceptible to natural disasters such as floods, earthquakes and cyclones. Effective town planning must integrate disaster risk reduction strategies including avoiding construction in high-risk zones, establishing evacuation routes and ensuring the structural integrity of buildings. Proper planning can reduce urban areas vulnerability to natural disasters and enhance their response and recovery capabilities. Furthermore, town planning plays a crucial role in creating cohesive communities and improving resident's quality of life. It can incorporate social amenities like schools, hospitals, community centers and recreational facilities. Well-designed neighborhoods with mixed land uses and ample public spaces foster social interaction, inclusivity and a sense of belongings among residents (IPCC, 2007). Historically, cities have often been viewed as safe havens from natural disasters and as buffers against environmental changes. However, today they are more accurately described as hotspots for catastrophes and risks, according to the United Nations for Disaster Risk Reduction.

Pakistan must take decisive measures to address the detrimental effects of climate change, given

the pressing reality of the situation. This issue has undoubtedly garnered the attention of the relevant authorities, who recognize its importance and sensitivity. Pakistan has undertaken numerous initiatives, such as formulating a climate strategy and action plans. The country enacted its first climate change laws in 2012, marking a significant milestone with the implementation of the National Climate Change Policy (NCCP). The NCCP includes over 120 policy recommendations that address a wide range of issues (Kurosaki et al., 2011).

The unique perspectives, innovative solutions and steadfast commitment of the country are invaluable contributions to the global effort against climate change. Pakistan introduced its National Climate Change Policy in 2012, refining it in 2021 to more effectively address the country's ongoing climate challenges. This policy employs a multifaceted approach that prioritizes communities, focusing on projects and sustainable agricultural practices to enhance resilience. It emphasizes mitigation and adaptation strategies, promotes renewable energy and encourages international collaboration to address the escalating climate crisis. In response to urgent climate issues, Pakistan has adopted a comprehensive approach that includes a variety of methods, such as technology-driven interventions and nature-based solutions.

Additionally, investing in climate-resistant crop research addresses both regional and global climate challenges. To enhance urban resilience, city planning integrates energy-efficient infrastructure and green spaces. Community-based adaptation strategies leverage traditional knowledge and address local vulnerabilities. Comprehensive educational programs are established to increase public awareness, promoting the adoption of sustainable practices. Pakistan is proactive in seeking international partnerships using these alliances to facilitate technology transfer and information sharing. Efforts to manage waste minimize environmental impact, while green finance strategies encourage investment in sustainable projects.

LITERATURE REVIEW:

Climate variations exert substantial impacts on human societies and economies, making climate change a critical concern in South Asia. This region, with its large population, features a landscape characterized by significant physical and ecological diversity, rendering it highly vulnerable to climate-related events such as backwater floods and rising sea levels. Positioned along river deltas and coastal areas, these nations face immediate threats. Additionally, many communities in South Asia are particularly vulnerable due to their heavy reliance on agriculture for their livelihoods (Worldbank, 2020).

Climate change is increasingly recognized as a major contributor to a range of societal and economic challenges, from disruptions in agriculture to the displacement of populations and issues related to national and international security. Anthropology provides crucial insights into the complex task of disentangling climate change from the broader social and material dynamics that shape human interactions with their environment. By examining the mechanisms within capitalist systems that drive greenhouse gas emissions, anthropologists' highlights why efforts to reduce these emissions encounter significant political and economic obstacles. Unlike temperature measurements, political institutions, interpersonal relationships and cultural interpretations are not easily quantified, yet they significantly influence human behavior. Accurately understanding these factors is essential for effective research and action (Brien et al., 2019).

Urban systems significantly contribute to climate change due to their heavy reliance on fossil fuels for numerous functions. These functions include constructing residential and commercial buildings and facilitating the transportation of goods, materials and people within cities and between urban and rural areas. Additionally, urban systems are responsible for providing essential services such as food supply, clean water, sanitation, electricity and heating all of which depend heavily on fossil fuels. As a result, the high demand for fossil fuels driven by urban systems directly exacerbates climate

change, highlighting a clear link between urban activities and environmental impact (Hammer & Malhotra, 2011)

The effects of climate change on urban areas are varied and specific to each location, including challenges such as reduced access to clean water, more frequent intense weather events like heavy rainfall and cyclones, increased flooding and inland storm surges and more frequent extreme heat events. Given the high population density and economic activity in cities, even minor climate changes can have substantial impacts, putting significant strain on urban infrastructure and services. As a result, urban systems and their residents face different levels of vulnerability. Additionally, the characteristics of urban environments can magnify these impacts, further increasing their vulnerability and potentially disrupting or endangering numerous urban functions (Cohen & Miller, 2018).

Addressing the global challenge of climate change requires a comprehensive and coordinated effort across all levels of society, including government, business and civil society. To effectively combat climate change, targeted strategies and actions tailored to various social and economic sectors are essential. This approach is known as sectoral planning. Climate change impacts a broad array of industries and sectors such as energy, transportation, agriculture, business and infrastructure. Each sector has distinct vulnerabilities to the physical effects of climate change and contributes differently to greenhouse gas emissions. Therefore, sectoral planning is crucial for reducing emissions, adapting to evolving conditions and enhancing resilience (Biesbrock et al., 2009).

To effectively address climate change, it is essential to integrate climate considerations into the planning processes of all sectors. This requires collaborations and coordination among stakeholders from government, business, academia and community organizations. By adopting a sectoral approach to planning, we can develop and implement strategies and policies tailored to the specific characteristics and challenges of each sector, while simultaneously

advancing our common goals of mitigating climate change and improving resilience. Local government entities such as municipal corporations, development authorities and provincial planning and development departments wield authority over town planning laws and regulations. These regulations aim to facilitate sustainable development and ensure the provision of essential services by governing the systematic development, construction and land usage within urban areas (Philips. E, 2007).

Incorporating climate and catastrophe risk considerations into urban planning and systems development is crucial for adapting to and mitigating the impacts of climate change. By thoughtfully addressing these factors, Pakistan can reap numerous benefits in the design and architecture of its cities. This climate-conscious strategy facilitates more efficient resource utilization, enhances service delivery and fosters the creation of resilient systems capable of withstanding weather and climate-related challenges (Le Gales, 2007).

Cities should adopt efficient urban design principles, emphasizing smart zoning and land use planning. This approach promotes compact, interconnected neighborhoods that reduce energy consumption and travel distances. Incorporating green spaces, urban parks and permeable surfaces can act as natural defenses against extreme weather, mitigating flood risks and alleviating the urban heat island effect. Additionally, peri-urban areas would be integrated into the official land management systems, subject to building regulations, zoning and land conversion controls. This integration would enhance their resilience to natural disasters and improve urban growth management (NAP,2023).

THEORETICAL PERSPECTIVE WITHIN THE ANTHROPOLOGY OF CLIMATE CHANGE

Margaret Mead advocated for the Forgarty International Centre to sponsor a new conference focused on creating a healthy atmosphere. This inaugural climate conference, titled “The Atmosphere: Endangered and Endangering”, was held at the National Institute

of Environmental Health Sciences in North Carolina in April 1975. Mead was among the few anthropologists present and possibly the only social scientist addressing a predominantly scientific audience. At the time of Mead's involvement, the anthropology of environmental change was a nascent field and although she did not explicitly promote the study of climate change among other anthropologists, the discipline of anthropology of climate change emerged in the 1990s, led by notable figures such as Steve Rayner, Brian Fagan, Carol Crumley, Mary Douglas and Carol Douglas. Four viewpoints that represent how anthropology has developed into a diversified endeavor are:

Cultural Ecological Perspective:

Many anthropologists today are exploring questions through the lens of cultural ecology, focusing on the multifaceted relationships between humans and their environments. Cultural ecology is an interdisciplinary approach that scrutinizes how human cultures interact with and adapt to their ecological surroundings. This approach delves into the ways cultures adjust to their specific environmental contexts, including their utilization of natural resources, subsistence methods and traditional environmental acknowledging that human activities can significantly influence ecosystems, potentially leading to environmental changes, degradation or sustainability. This perspective often assesses the sustainability of cultural practices and their long-term ecological impacts, considering how cultures adapt to environmental changes and how traditional practices might offer insights into resilience and sustainable living. By integrating knowledge from anthropology, sociology, ecology, geography, and other fields, cultural ecology provides a comprehensive understanding of the complex interactions between humans and their environments (Nuttall et al., 2004).

Cultural interpretive Perspective:

Many people's local knowledge or cultural interpretations of climate change often employ this perspective. This viewpoint prevails

because it builds upon earlier research by sociocultural anthropologists who focused on small communities or cultures, collecting data on individuals' emic (insider) perspective. Due to their local knowledge, many individuals, particularly those who are privileged, might be aware of climate change. However, their unique cultural perceptions can sometimes lead to minimizing or even denying the reality of climate change and the role of human actions in causing it. Therefore, it is crucial to address resistance to change that is culturally specific (Reuters, 2021).

Critical Anthropology of Climate change:

The critical anthropology of climate change draws from political ecology theory, recognizing the inherently political nature of human-environment interactions and incorporates an eco-social perspective. It explores several key issues, including the relationship between global sustainability and the capitalist mode of production, the influence of power dynamics in the creation and regulation of pollution, the inequitable and unjust distribution of climate change impacts, the contradictions inherent in green capitalism and current carbon mitigation and sustainability efforts and the various social movements opposing corporate environmental harm. This perspective argues for the establishment of a new world order that prioritizes fulfilling human needs, promoting social justice, democracy, environmental sustainability and achieving climate stability.

Applied Anthropology Perspective:

Anthropologists have been tackling sustainability issues from two distinct perspectives: Contributing to the development of environmental policies and engaging with the environmental movement that advocates for social, technological and economic transformation toward sustainable practices. It is likely that more anthropologists will become actively involved as researchers and observers in efforts to address environmental changes across local, regional, national and international scales. To achieve this, we must collaborate as consultants with national and local

governments, environmental NGOs, concerned communities and movements dedicated to

RESEARCH METHODOLOGY:

1. Research Goal

2. Design of interview guide and Selection of participants

3. Transcription of interviews

4. Identification of main themes, Synthesis and analysis

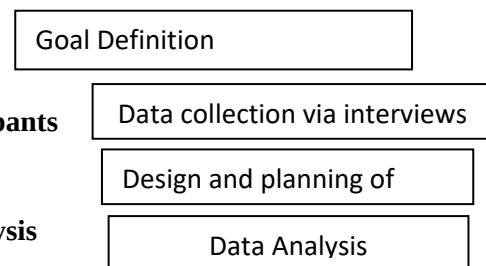
The steps shown in Figure 1 were not carried out without going back in a formal order. However, the research goal, interview guide, interview questions, and conclusions underwent a number of changes during the course of the study. The study objective and research questions were used to develop the interview guide for this project. As previously indicated, the interview guide underwent various updates, such as those made following the initial interview. The interview guide's format and question order were revised following the initial interview, resulting in the final iteration. You may locate the interview guide here. The interview guide was created around the following themes: Comprehensive Planning, Urban Design planning, Challenges of Poorly maintained infrastructure, Lack of access to information, Access of critical resources and Fragmented Governance and planning.

Qualitative Research

The aim of qualitative research is to gain a deeper insight into human behaviors, experiences, and perspectives by collecting and analyzing data that is not numerical. In order to obtain understanding of the social and cultural surroundings of a certain event, it includes acquiring information in the form of interviews, observations, or textual analysis. The perspectives, experiences, and behaviors of government officials, policy makers, urban planners, and other stakeholders can be usefully revealed through qualitative study on climate change and town planning in Pakistan. Within the context of town planning, it can assist in identifying challenges and opportunities for efficient measures for reducing climate change.

The estimated outline of the entire research project, or methodology, describes the attributes

climate action and sustainability.



of the research (including the study design or procedures, tools and instruments to be employed, and the unit of analysis and methods or software that would be used to analyze the data (Lamanauskas, 2020). Sometimes, the terms "research methodology" and "data collection procedures" are used interchangeably. However, the type of study to be conducted or the topic of interest will determine the approach. Additionally, a specific methodology displays many approaches.

For instance, when descriptive approach is applied in a qualitative research project, it advises using the following techniques: Observation, Interview even though survey could also be utilized as a technique to speak with respondents for the first time in the field (Lamanauskas, 2020). There are various types of research methods, including descriptive, explanatory, exploratory, and ethnographic. Methodology is sometimes misunderstood and confused with approaches. However, the major contrast is that techniques refer to the procedures and equipment used to collect data, whereas methodology outlines an entire research plan.

In terms of the study question, the researcher used descriptive methodology. The goal of the descriptive study is to identified the challenges that prohibits human settlements from adapting climate change. This research is primarily concerned with what happened rather than how or why it occurred. As a result, technologies like observation and survey are routinely used to collect data. In order to examine and characterize human experiences, this project uses qualitative research methods (Bryman, 2016). The suggested study looks on the experiences of urban planners who have faced human settlements in adapting to climate change. Qualitative research is also regarded in

social science as a technique that offers more in-depth details about the subject under investigation and is helpful in describing the social reality (Bryman, 2016). The study technique for this work is demonstrated by the project, which uses primary data obtained through semi-structured interviews with open-ended questions done with urban planners.

RESULTS AND ANALYSIS:

Adapting human settlements to climate change poses numerous challenges, but addressing them effectively is crucial for building resilience and ensuring the well-being of communities.

Limited Resources

Through the interview, it was possible to assess how human settlements, especially in developing countries, face resource constraints that hinder their ability to invest in climate adaptation measures. Governments, international organizations and local communities should prioritize resource allocation for adaptation projects, provide financial assistance and explore innovative financing mechanisms such as public-private partnerships and climate funds. One of participants provided insights into the challenges:

“We advocate for national climate change policies that recognize the critical importance of adapting human settlements to climate change while acknowledging the constraints of limited resources. By prioritizing inclusive, innovative and cost-effective strategies, we can build resilient cities that protect vulnerable populations and promote sustainable development in the face of climate uncertainty.”

Lack of Awareness and Capacity

In this research, the experiences that urban planners were examined. Inadequate knowledge and awareness about climate change and its impacts can hinder effective adaptation efforts. Governments, educational institutions and civil society organizations should invest in public awareness campaign, capacity building programs and training initiatives to empower communities with the knowledge and skills needed to adapt to climate change. A respondent

claimed that:

We recognized the critical importance of integrating climate change adaptation into national policies. However, we also acknowledge the significant barriers posed by a lack of awareness and capacity within human settlements. By prioritizing education, capacity-building and inclusive decision-making processes, we can empower communities to effectively adapt to climate change, ensuring the resilience and sustainability of our cities.”

Fragmented Governance and Planning

It also found that one of the main issues facing human settlements by adapting climate change that fragmented governance structures and lack of coordination among government agencies, stakeholders and sectors can impede integrated and holistic adaptation planning. Governments should adopt multisectoral and participatory approaches to urban and regional planning, strengthen institutional coordination mechanisms and promote collaboration and knowledge sharing among relevant stakeholders. An interviewee respond that:

“We advocate for cohesive and integrated governance frameworks within national climate change policies. Fragmented governance and planning hinder our collective ability to effectively address the challenges of climate change in human settlements. By fostering collaboration, coordination and alignment across governmental departments, levels of government and sectors, we can develop holistic and resilient strategies that enhance the adaptive capacity of our communities and ensure sustainable urban development in the face of climate change.”

Vulnerability of Informal Settlements

Informal settlements, which are frequently found in hazardous places and lack basic infrastructure and services, are particularly vulnerable to the effects of climate change, as was revealed during the interview. Upgrading and formalizing informal settlements, expanding access to essential services like water, sanitation, and healthcare, and putting policies in place to make them more resilient to climate-

related risks should be top priorities for governments. A participant provided insights into the vulnerability of informal settlements:

We emphasize the urgent need for national climate change policies to address the vulnerability of informal settlements. These communities often marginalized and lacking basic infrastructure, are disproportionately affected by climate change impacts. By prioritizing inclusive and participatory approaches, investing in resilient infrastructure and providing support for community-led adaptation initiatives, we can enhance the adaptive capacity of informal settlements and ensure that no one is left behind in our collective efforts to build climate-resilient cities."

Infrastructure Deficits

According to the findings of interviews, one of the main issue is that aging Infrastructure and inadequate investment in resilient infrastructure pose significant challenges for adapting human settlements to climate change. Governments should prioritize investments in climate resilient infrastructure, retrofit existing infrastructure to withstand extreme weather events and incorporate nature-based solutions and green infrastructure into urban development plans. An interviewee addresses the infrastructure deficits:

"We emphasized the urgent need for national climate change policies to address infrastructure deficits in human settlements. Insufficient or outdated infrastructure exacerbates the vulnerability of communities to climate change impacts. By prioritizing investments in resilient infrastructure, such as green infrastructure, flood defenses, and sustainable transportation systems, we can enhance the adaptive capacity of our cities and safeguard the well-being of residents. It is imperative that national policies recognize and address these deficits to ensure a sustainable and climate-resilient future for all."

Social Inequalities

Through the interview, it was possible to access that climate change exacerbate existing social inequalities and disproportionately affects vulnerable and marginalized groups, including

women, children, the elderly and people with disabilities. Adaptation strategies should be inclusive, equitable and socially just taking into account the needs, priorities and perspective of all community members and ensuring that vulnerable groups are not left behind. A respondent claimed that:

"We urge national climate change policy to address the pressing issue of social inequalities that exacerbate vulnerability in human settlements. Marginalized communities bear disproportionate burdens from climate impacts due to historical injustices, lack of resources and limited access to decision-making processes. By prioritizing equity, inclusion and justice in policy formulation and implementation, we can ensure that adaptation efforts benefit all residents, particularly those most vulnerable, fostering resilient, cohesive and sustainable communities in the face of climate change."

Land Use Change and Urbanization

An interviewee observed that rapid urbanization, land use change and unplanned development can increase exposure and vulnerability to climate change impacts. Governments should promote compact, sustainable and resilient urban development patterns, enforce use planning regulations and integrate climate considerations into land use planning and zoning decisions.

"We recognize the critical role of land use change and urbanization exacerbating climate change impacts on human settlements. National climate change policies must lead responsible urban development and encourage sustainable land use practices in order to address these issues. Through the integration of smart growth, compact development, green infrastructure, and mixed land use principles, it is possible to both promote vibrant and livable communities that are climate resilient and to reduce the negative consequences of urbanization on that resilience"

Ecosystem Degradation

Through the interview, researcher found the experiences of interviewers regarding the issues or barriers of adapting climate change so one of

the main issue is that degradation of natural ecosystems such as forests, wetlands and coastal areas reduces their ability to provide critical ecosystem services and increases the risk of climate-related disasters. Governments should prioritize ecosystem restoration and conservation efforts, protect natural habitat and promote nature-based solutions such as ecosystem-based adaptation and green infrastructure.

We advocate for national climate change policies that prioritize the protection and restoration of ecosystems to enhance the resilience of human settlements. Ecosystem degradation exacerbates the impacts of climate change, compromising the well-being of communities and their ability to adapt. By integrating nature-based solutions, such as preserving green spaces, restoring wetlands and promoting biodiversity, we can bolster the adaptive capacity of cities and foster sustainable development. It is crucial that national policies recognize the interconnectedness between ecosystems and human settlements and support initiatives that promote the coexistences of thriving ecosystems and resilient communities in the face of climate change.

Problems in Implementing the Climate Change Policy

Coordination barriers

At the provincial level, there isn't yet a climate change council that can connect to the federal council to coordinate a shared mandate. It is unclear who has the formal power to enforce provincial climate change policy mandates. It would be futile to establish a federal climate change authority since it would merely replicate the efforts of disaster risk management authorities.

Lack of common understanding on how to govern climate change related actions

It takes time and resources twice to develop climate change policies at the provincial level. To strengthen sectoral cohesions, there is no linkage between the flood risk management plan of the disaster management authorities and the national disaster protection plan.

Issues of differing Federal and Local priorities and knowledge gaps:

Coordination issues are not presently being caused by federal and provincial priorities. Inadequate technical capability to tackle climate change challenges at the provincial level has led to problems with the issue's prioritizing. It is challenging to advance the climate change agenda locally because it is a new topic, particularly when it is federally driven.

Analysis of loopholes in Pakistan's climate change policy

One of the main shortcomings of Pakistan's climate change policy is the disregard for plans and strategies for adaptation. While mitigation strategies aim to reduce greenhouse gas emissions, adaption strategies focus on enhancing resilience and adapting to the effects of climate change. However, there are insufficient and disjointed plans for adaptation that take into account the particular vulnerabilities and needs of numerous sectors and businesses. In order to effectively address climate change, Pakistan needs robust adaptation strategies that take into account the diverse socio-economic and ecological conditions of the country.

A little attention paid to green power and mitigating measures

Another shortcoming of Pakistan's unique climate change plan is its lack of focus on mitigation and renewable energy. However, comprehensive strategies and policies to promote energy efficiency and renewable energy are absent. To address this gap, Pakistan must give priority to developing and utilizing renewable energy sources, such as hydropower, wind, and solar energy. Legislative and regulatory frameworks that are supportive, financial incentives for investments in renewable energy, and encouragement of the expansion of clean energy technology research and development are all required to accomplish this.

Weak enforcement mechanisms and monitoring systems:

One more weakness in Pakistan's innovative

approaches to combating climate change is the absence of efficient protocols for oversight and implementation. Even when laws and regulations are in place, their ability to be implemented and followed is compromised by a lack of effective enforcement mechanisms. Lack of funding, corruption, and poor institutional competence all make this problem worse. Tracking progress, assessing the effectiveness of policy initiatives, and identifying areas that require more attention all depend on having a robust monitoring and evaluation system in place.

Poor sectoral planning incorporation of climate change

The poor integration of climate change concerns into sectoral strategies is a basic weakness of Pakistan's climate change policy. Climate change is a cross-sectoral issue that affects several industries, such as agriculture, water resources, urban architecture, and health. Sectoral policies, plans, and strategies must incorporate both adaptation and mitigation measures for the effects of climate change in order to achieve this. Similar to this, green spaces, climate-friendly infrastructure, and energy-efficient buildings should be prioritized in urban development rules. Pakistan may make sure that its sectoral policies are more cogent and well-coordinated by including climate change into them.

Ineffective international cooperation and collaboration

A further weakness in Pakistan's climate change policy is the lack of fruitful international engagement and relationships. Global issues such as climate change demand worldwide cooperation and cooperative action. Funding from outside, investment, technology transfer, and information sharing can all help Pakistan's efforts to become more resilient to climate change and lessen its effects. To close this gap, Pakistan needs to get more involved in global climate change forums like the UNFCCC and fortify its ties with developed countries, non-governmental organizations, and international organization.

In summary, in order to effectively reduce

emissions and prepare for them, a number of shortcomings in Pakistan's climate change strategy must be addressed. These shortcomings include the following: weak monitoring systems, inadequate attention to renewable energy and mitigation techniques, inadequate plans and strategies for adaptation, and insufficient integration of climate change into sectoral policies.

CONCLUSION

As Pakistan's environmental trends continue to deteriorate, the country's sustainability concerns have become more pressing. Because of the lack of technology and financial resources, capacity issues, unsustainable production and consumption, population growth, poverty, and inequality, there is a good chance that the gravity will worsen. The challenge of climate change is the most significant issue to have surfaced recently. In light of the growing number of symptoms, such as droughts and floods, dealing with climate change has become an imperative for the nation. The large range of possible effects of climate change that have been identified are expected to have an impact on all aspects of development, spanning numerous sectors and ecosystems.

All in all, the government, the commercial sector, significant organizations, and civil society are called upon to take action in response to environmental concerns, whether they are related to climate change or not. With little funding, the government will have to concentrate on enlisting the private sector, enhancing laws, and promoting decentralization and power devolution. It must also work to improve collaboration on matters of global concern, like climate change. Through innovation, investments in environmental projects, and operationalizing environmental issues, the private sector will need to take on a more proactive role in the environment. Major groups and informed citizens must play a critical role as change agents through involvement, advocacy, collaboration, and communication. Pakistan's environmental future hinges on governmental policy and institutional reforms. Innovations will remain scarce without a supportive incentive system and favorable

policy environment. High costs will deter the replacement of current technologies with cleaner alternatives unless international technology transfer is facilitated. The country's environmental trajectory depends on the implementation of policies and reforms by the government. Policymakers must price environmental assets and finite natural resources more accurately to enhance their efficient use. Additionally, it is essential for policymakers to eliminate environmentally harmful subsidies, clearly define property rights, and increasingly privatize the provision of water supplies, sanitation, waste treatment, protected area management, and transportation infrastructure. These privatized services should be funded by user fees that progressively reflect the long-term cost of supply.

RECOMMENDATION

The use of urban planning as a strategy for climate change adaptation and mitigation is growing in importance. Experts predict that risks associated with climate change, including landslides, floods, droughts, and extreme weather, would worsen due in part to rising sea levels and global temperatures. Multidisciplinary and preventive land management approaches are required to be ready for these calamities in the future. Disaster risk reduction is largely dependent on urban planning, specifically as it relates to the growth of urban areas.

Addressing climate change mitigation and adaptation requires long-term, sustainable urban planning that incorporates several key strategies: conducting studies to assess future expansion needs of existing towns, identifying optimal sites for urban development and climate-resilient areas, regulating land use and development through building codes and land use laws, retrofitting and constructing communities to withstand climate-related disasters (e.g., elevating buildings), relocating urban populations at risk from climate change, updating urban energy and transportation systems, and implementing engineering measures for climate-resilient infrastructure. Given the complex interplay between urbanization and climate change, collaboration

across various administrative levels (international, national, regional, local) and sectors (government, public, municipal, private) as well as interdisciplinary cooperation (land management, water management, housing, energy supply, industry, transport) is crucial. In this context, the International Federation of Surveyors (FIG) emphasizes the role of surveyors in responding to climate change by contributing to climate-resilient infrastructure development, enhancing political relationships at both national and international levels, and promoting economic, social, and environmental sustainability.

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