Policy Brief

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Promoting Community Leadership for Strengthening Climate Change Resilience in Pakistan

Contents

Executive Summary

Climate change, driven by a complex interplay of factors is creating serious environmental and development challenges for Pakistan. The country is currently dealing with various climate-related challenges ranging from accelerated glacial melt, prolonged droughts, flash floods, and heatwaves to increasingly erratic weather patterns. These issues have profound and far-reaching implications for Pakistan's agricultural productivity, water resources, and overall economic stability. As climate change continues to intensify, Pakistan's vulnerability to these problems is likely to grow, putting millions of livelihoods at risk and deepening social and economic inequalities.

The communities hit hardest by climate-related disasters face not only the immediate damage to their surroundings but also long-term socio-economic repercussions that undermine their resilience. In this challenging context, the promotion and strengthening of community leadership emerge as critical components in addressing the multifaceted challenges posed by climate change. Empowering local communities to design, develop, and implement solutions tailored to their specific needs and vulnerabilities is essential for effective climate adaptation and mitigation. However, this empowerment cannot occur in isolation; it requires robust government support, including financial and technical support, to keep these local efforts going.

Government intervention is particularly crucial in ensuring that resources are allocated in a way that meets local needs, allowing communities to address their most urgent challenges and opportunities. This approach not only helps create sustainable solutions but also makes climate resilience efforts more effective by ensuring that they are rooted in local knowledge and experience. Additionally, including community leaders in policymaking is essential for building a sense of ownership and responsibility at the grassroots level. This engagement is vital for the success of any climate adaptation and mitigation strategies, as it ensures that policies are not only implemented but embraced by those most affected.

Addressing the complex challenges of climate change in Pakistan requires a collaborative approach that connects local knowledge with broader policy goals. By investing in community-driven initiatives and ensuring resources are distributed fairly and according to local needs, Pakistan can build resilience against the growing impacts of climate change. This strategy will not only mitigate the immediate and long-term effects of climate change but also pave the way for a more sustainable and resilient future for communities across the country. Through these efforts, Pakistan can turn its vulnerabilities into strengths, setting an example of how empowered communities can lead the way in climate adaptation and sustainable development.

Introduction

Climate change is a global phenomenon with far-reaching consequences, and Pakistan is among the most vulnerable nations facing its impacts. According to the 2020 Inform Risk Index, Pakistan ranks 18th out of 191 countries for disaster risk, making it one of the highest-risk nations worldwide.[1] With a population of 231.4 million, Pakistan is the world's fifth most populous country, and it has experienced a marked increase in the frequency and intensity of extreme weather events over recent decades, including floods, storms, and extreme temperatures. The country's climate is predominantly arid in the southern coastal regions, with monsoon and Mediterranean influences in the northern uplands.[2] The catastrophic floods of 2022, which submerged one-third of the country, had devastating effects on Pakistan's economy and the lives of millions of people.[3]

Pakistan's economy is heavily reliant on climate-sensitive sectors, particularly agriculture, which contributes 22% to the national GDP and employs approximately 38% of the total workforce.[4] According to the World Bank's Country Climate and Development Report (CCDR), the risks posed by severe climate-related disasters, air pollution, and environmental degradation are projected to reduce Pakistan's GDP by 18-20% by 2050, significantly hindering progress toward poverty alleviation and economic development.[5]

Even under the most optimistic emissions scenarios, global average temperatures are expected to rise by approximately 3.7°C by 2080–2099.[6] Although droughts are predicted to become more frequent, there is limited knowledge regarding changes in Pakistan's hydrological regimes and water supply. The increasing frequency and severity of extreme weather events are anticipated to exacerbate disaster risks, particularly for underprivileged and marginalized communities. The direct impacts of climate change on these communities underscore the need for community-based solutions and localized adaptation strategies. Vulnerable groups, including women and children who depend heavily on natural resources, are disproportionately affected by climate change. The events of recent years have highlighted the urgent need for comprehensive action to enhance the resilience of these vulnerable populations, particularly in mountainous regions. The concepts of climate change adaptation and resilience-building at the community level are gaining prominence, and community engagement and leadership are essential to fostering local resilience. Promoting community-based solutions and local initiatives is critical, as they offer tailored responses to the diverse adaptation needs of communities. The importance of community leadership in addressing

[1] World Bank Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability.
[2] World Bank Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability.
[3] Sands, B. L. (2022, August 30). Pakistan floods: One third of country is under water - minister. Retrieved from https://www.bbc.com/news/world-europe-62712301
[4] World Bank Open Data. Retrieved from https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=PK
[5] World Bank Group. (2022, November 10). Pakistan Urgently Needs Significant Investments in Climate Resilience to Secure its Economy and Reduce Poverty. World Bank. Retrieved from https://www.worldbank.org
[6] ibid

climate change was also recognized at COP 27, where the Global Center on Adaptation awarded Adaptation Champion titles for such efforts.[7]

Pakistan's Climate Challenges

The World Bank Group's Country Climate and Development Report (CCDR) highlights the devastating impact of the 2022 floods in Pakistan, which resulted in over 1,700 deaths and displaced approximately 8 million people.[8] The economic losses and damages exceeded $30 billion, with significant destruction of infrastructure, assets, crops, and livestock.[9] With over 20% of the population living below the poverty line—63% of whom reside in rural areas—the impact of climate change is particularly severe on these communities, necessitating community-based solutions. Pakistan's primary climate-related hazards include floods, extreme temperatures, storms, and diseases, accounting for more than 60% of the country's annual catastrophic events between 1980 and 2020.[10]

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The country is also prone to other significant hazards such as landslides and droughts. Between 1980 and 2000, Pakistan experienced 12 flood years, followed by 16 more between 2001 and 2020. Between 2008 and 2022, Pakistan reported 107 disaster events, with floods displacing 23.6 million people. Despite contributing less than 0.30% to global carbon dioxide emissions, Pakistan suffers disproportionately from the disastrous effects of climate change, with frequent extreme weather events threatening income, shelter, food security, and overall safety.

The gravity of this situation demands urgent and decisive action from the Pakistani government to mitigate the adverse effects of climate change. Pakistan experiences considerably higher average temperatures than the global average, with projections indicating an increase of 1.3°C to 4.9°C by the 2090s compared to the baseline of 1986-2005.[11] The country frequently records some of the world's highest maximum temperatures, with an average monthly maximum of approximately 27°C and an average June temperature of 36°C. Many regions experience annual temperatures exceeding 38°C, leading to prolonged heatwaves that severely impact public health. Pakistan witnessed 126 heatwaves between 1997 and 2015, averaging seven per year, with an increasing trend.

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[7] The Global Center on Adaptation. (2023, March 24). Community-led initiatives for climate change adaptation recognized at COP27 - Global Center on Adaptation. Retrieved from

[8] Open Knowledge Repository. Retrieved from https://openknowledge.worldbank.org/handle/10986/38277

[9] Eckstien, D., Kunzal, V., & Schafer, L. (2021, January). GLOBAL CLIMATE RISK INDEX 2021. Who Suffers most from Extreme weather Events? Weather Related Loss Events in 2019 and 2000-2019. GermanWatch. Retrieved from https://www.germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_2.pdf

[10] World Bank Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability

[11] Chaudhry, Q. U. Z. (2017). CLIMATE CHANGE PROFILE OF PAKISTAN. Asian Development Bank. Retrieved from https://www.adb.org/sites/default/files/publication/357876/climate-change-profile-pakistan.pdf

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The current annual probability of a heatwave occurring in any given location in Pakistan is approximately 3%. During the 2015 heatwaves alone, over 65,000 people were hospitalized due to heatstroke, highlighting the vulnerability of a significant portion of the population.[12]

As a lower-middle-income country, Pakistan's economy is predominantly agrarian, with food and nutrition security heavily dependent on climate-sensitive land, water, and forest resources. Approximately 42% of the population relies on agriculture as a primary source of income, and nearly 90% of agricultural land is irrigated by the River Indus and its glacier-fed tributaries.[13] The increasing rate of glacier melt due to climate change has raised the risk of glacier lake outburst floods (GLOF) and downstream mudslides. Rising temperatures are altering the flow of the River Indus, changing seasonal patterns, accelerating glacier melt, and causing erratic rainfall—all of which are poised to significantly affect agriculture, food production, and human livelihoods. With 39% of the population already living in poverty, this percentage is expected to rise as loss of livelihood becomes increasingly common during climate-related disasters. [14]Factors such as heat exhaustion, malnutrition, the spread of vector-borne diseases like dengue fever, and an increase in waterborne infections will further undermine people's ability to work and sustain themselves. In addition, smog is a severe issue in Pakistan's industrialized eastern Punjab region, particularly in Lahore, where smoke pollution is pervasive during the winter months.

As the climate continues to change, millions of underprivileged people will face serious challenges, including extreme weather, health impacts, social protection, economic instability, mobility issues, water insecurity, threats to cultural heritage, and other dangers.[15] Global patterns of inequality are closely linked to climate change, with vulnerable communities suffering the most despite contributing the least to the crisis. The groups most susceptible to the effects of climate change include migrants, internally displaced people, and members of religious and ethnic minorities, who often reside in high-risk areas and have limited access to healthcare due to low incomes from informal work. Climate change is likely to exacerbate social issues such as child marriages, early childbirth, and domestic violence. Decreased food production will heighten the risk of malnutrition, particularly among women and children. The repercussions of climate change are increasingly severe, with natural disasters and their impacts on health, food security, socioeconomic stability, and cultural identity presenting disproportionate challenges for millions of vulnerable people. These individuals' financial, socioeconomic, cultural, gendered, and geographic circumstances contribute to their vulnerability, along with their access to justice, healthcare, and decision-making processes. Moreover, Pakistan hosts over 3.7 million refugees from war-torn Afghanistan, and the ongoing effects of climate change are exacerbating the region's already severe refugee crisis.

[12] World Bank Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability

[13] Agriculture Statistics | Pakistan Bureau of Statistics. (n.d.). Retrieved from https://www.pbs.gov.pk/content/agriculture-statistics

[14] Climate Change and its impacts in Pakistan. (2022, June 17). Retrieved from https://www.pakistantoday.com.pk/2022/06/17/climate-change-and-its-impacts-in-pakistan/

[15] Pakistan Case Study. Climate Refugees . Othering & Belonging Institute at UC Berkely. Retrieved from

Role of Community Leadership in Climate Action

Communities are the foundation of society, and their active engagement is essential for building resilience within local environments. In Pakistan, known for its diverse cultural fabric, harnessing the potential of community leadership is more crucial than ever. Involving communities in climate action enables the customization of solutions to local needs, taking into account unique cultural and regional differences.[16] The latest report from the Intergovernmental Panel on Climate Change (IPCC) underscores the importance of integrating various forms of knowledge—including scientific, Indigenous, and local knowledge—in building climate resilience.

Innovations in climate finance architecture can provide marginalized communities and individuals with access to advanced policy, technical, and financial support, leading to development outcomes that are both successful and locally relevant. Communities bring unique perspectives, expertise, and knowledge that are vital for addressing the challenges of improving resilience and combating climate change. It is imperative that communities assume leadership in resilience-building initiatives, participating actively not only as beneficiaries but as leaders and decision-makers. Community leaders have the capacity to set objectives, take ownership, and design and manage investment programs that cater to their specific needs. The indigenous knowledge that communities possess significantly enhances the efficiency and sustainability of development efforts.

Community leadership fosters ownership and empowerment within Pakistan's local communities. Through active engagement, communities are empowered to take responsibility for their futures, thereby promoting sustainability. This leadership allows for the tailoring of solutions to the geographic, social, and cultural needs of the community, ensuring that problem-solving approaches are community-specific. In a society as diverse as Pakistan, social cohesion can be strengthened through collaboration, which is critical for effective climate action. Local communities have the capability to effectively implement projects, adapt to local conditions, and overcome administrative obstacles, ensuring the successful execution of local initiatives.[17]

By assuming leadership in building sustainable communities that are resilient to climate change, communities can develop solutions to regional disparities and cultural variations across Pakistan's varied landscapes. Their extensive local expertise enhances development initiatives by increasing both efficiency and sustainability.

Role of Youth

Climate change poses a significant threat to Pakistan, but it also provides an opportunity for young people to unite and take action. With approximately 64% of Pakistan's population under

[16] Arshad, T. (2023, October 31). Community engagement and social responsibility: Grassroots approaches to the SDGs in Pakistan – Institute of International Peace Leaders. Retrieved from https://internationalpeaceleaders.com/community-engagement-and-social-responsibility-grassroots-approaches-to-the-sdgs-in-pakistan/

[17] Climate Change leadership. Johnson Institute for Responsible Leadership. Retrieved from https://www.johnsoninstitute.pitt.edu/research/climate-change-leadership

thirty, this demographic holds immense potential for driving climate action.[18] Youth can actively engage in climate change adaptation and mitigation initiatives through various means, such as community mobilization, raising awareness, advocating for environmentally friendly policies, and promoting innovative solutions.

The youth of Pakistan have the ability and potential to take on leadership roles within their communities. Although many young people are already involved in grassroots-level initiatives, there is a need to accelerate these efforts. Pakistan must invest in building the capacity of its youth to develop tomorrow's climate change leaders. Bottom-up approaches are particularly crucial for Pakistan, as top-down climate action initiatives have often proven ineffective. Youth-led approaches are more likely to succeed because they are more responsive to the specific needs of their communities.

Interdisciplinary collaboration among youth across different sectors is key to addressing climate change. A comprehensive and multidisciplinary strategy is required, involving civil society, industry, and government. Youth can play a significant role in bridging these sectors and facilitating collaboration. Moreover, young people can contribute to developing international cooperation in the fight against climate change by sharing knowledge and experiences. Pakistan's youth must lead climate action by advocating for and implementing community-based solutions to climate change.

Women as Agents of Change

Pakistan is one of the most vulnerable countries to the effects of climate change, with significant cross-sectional impacts that disproportionately affect women compared to men. Women make up approximately 50% of the country's population and possess extensive knowledge of local natural resources, yet they are often excluded from decision-making processes related to climate action.[19] While progress has been made, with more women taking on leadership roles, there is still much work to be done.

The government must promote inclusive policy discourse, capacity building, and pilot initiatives for women by emphasizing gender equality as a fundamental principle and integrating women into policy formulation and program development at both local and national levels. The Ministry of Climate Change, Government of Pakistan, with financial assistance from the Green Climate Fund, has adopted the Climate Change Gender Action Plan (ccGAP). This plan aims to incorporate gender equality and women's empowerment into climate change discussions and actions in Pakistan.[20]

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[18] [18] United Nations. (2018, July 24). Unleashing the potential of a young Pakistan. Retrieved from https://hdr.undp.org/content/unleashing-potential-young-pakistan#:~:text=Currently%2C%2064%20percent%20of%20the%20nation%20is%20younger,to%20continue%20to%20increase%20until%20at%20least%202050.

[19] TRADING ECONOMICS. Pakistan - population, female (% of total) - 2024 data 2025 forecast 1960-2022 historical. Retrieved from https://tradingeconomics.com/pakistan/population-female-percent-of-total-wb-data.html#:~:text=Population%2C%20female%20%28%25%20of%20total%20population%29%20in%20Pakistan,of%20development%20indicators%2C%20compiled%20from%20officially%20recognized%20sources

[20] IUCN and MoCC launch Pakistan's First-ever Climate Change Gender Action Plan. Retrieved from https://www.iucn.org/news/202207/iucn-and-mocc-launch-pakistans-first-ever-climate-change-gender-action-plan

Beyond discourse inclusivity, it is essential that women lead community-based efforts in their areas, given their deep understanding of local, cultural, and gender contexts. Women-led grassroots initiatives can play a crucial role in building the capacity of local women to withstand the natural calamities associated with climate change.

Case Studies of Successful Community-led Climate Initiatives

Local Initiatives:

Chitral Valley's Small Hydropower Plants:

Rural communities in the Chitral Valley have successfully developed and operated small hydropower plants and are now assisting other communities in implementing new plants to meet their electricity demands.[21] Major investors have historically neglected the Chitral Valley due to its lack of grid connection. However, the local population, with the support of the Aga Khan Rural Support Program (AKRSP), has been generating hydropower for decades. Recognizing the success of these efforts, the Khyber Pakhtunkhwa government has entrusted the community with implementing over 50 micro hydropower plants in the valley. Local communities play a significant role in supplying electricity from these plants to households, educational institutions, commercial areas, and government offices, including police stations and Chitral force cantonments.[22]

Gilgit Baltistan's Integrated Irrigation Systems and Hydropower Plants:

The communities of Gilgit-Baltistan have established integrated irrigation systems and community-run hydropower plants to meet local energy demands. The Gilgit-Baltistan region, known as the "water bank" for Pakistan, is facing the brunt of global warming. The accelerated melting of snow and glaciers has led to more frequent summer floods, including Glacier Lake Outburst Floods (GLOF), which impact community-based hydropower plants. Power is required to pump water and initiate "plasticulture" for high-value vegetable and fruit production during both winter and summer, addressing water shortages in steep terrains. This necessitated the development of hydropower to provide electricity at a reasonable tariff, compensating for the lack of water during high-demand periods. Developing grid systems for isolated irrigation schemes in rugged terrain was deemed unnecessary. Instead, integrated irrigation and micro hydropower systems were pursued. At the Mountain Agriculture Research Centre (MARC), Trout Farming Station in Juglote, a water plan was created to raise trout and generate hydropower.[23] The hydropower system provides all the electricity needed for the station, including the incubator and lab equipment. The technique

[21] Baigal, P. M. (2020, October 1). Chitral pioneers community hydropower schemes. Dialogue Earth. Retrieved from https://dialogue.earth

[22] Sarfaraz, H., & Ahmed, S. (2016, May). Case Studies on Best Practices in Climate Change Adaptation in Pakistan. Rural Support Programmes Network (RSPN), and International Centre for Integrated Mountain Development (ICIMOD). Retrieved from https://www.rspn.org/wp-content/uploads/2020/01/Best-Practices-in-climate-change.pdf

[23] ibid

is simple enough for Gilgit-Baltistan communities to manage, especially when combined with irrigation and small hydropower efforts.

Global Initiatives

Sri Lanka: Nature-Based Flood Mitigation: Sri Lanka has been increasingly affected by severe weather patterns, leading to recurrent flooding and significant economic and social damage. In response, the country has implemented nature-based flood mitigation solutions aimed at reducing climate and disaster risks. The ACTION initiative, in collaboration with the Disaster Management Centre, Mayfield Tea Estate, World Vision, local government, and disaster management committees, has been instrumental in providing flood protection and prevention in Hatton, Sri Lanka. This initiative focuses on developing a local Disaster Risk Reduction (DRR) plan, which includes improving drainage, river restoration, and green infrastructure to protect against floods and landslides.

Implementing nature-based flood mitigation solutions involves the active participation of local communities and stakeholders, providing effective flood control while delivering additional benefits such as improved water quality, increased biodiversity, and enhanced livelihood resilience. These efforts not only address immediate climate-related dangers but also promote sustainable and environmentally friendly practices that safeguard local biodiversity and enhance ecosystem services. By integrating these approaches into flood control programs, Sri Lankan communities can bolster their resilience to climate-related risks and encourage behaviours that contribute to long-term climate change adaptation.[24]

South Africa: Local Government Climate Change Support Program: South Africa's cities and towns are at the forefront of the country's efforts to reduce emissions and develop a low-carbon, climate-resilient economy. Recognizing the critical role of local governments, the national government launched the Local Government Climate Change Support Program (LGCCSP), a comprehensive capacity-building initiative aimed at enhancing the ability of provinces and municipalities to effectively address climate change. Led by the South African Department of Environment, Forestry and Fisheries (DEFF), this collaborative initiative involves various stakeholders and serves as a model of multi-level climate collaboration.

The LGCCSP has been instrumental in developing knowledge and capacity that continue to shape South Africa's climate policy framework. By equipping local governments with the tools and expertise needed to implement climate actions, this program ensures that climate change mitigation and adaptation efforts are both effective and sustainable, with a focus on empowering local authorities to take leadership in their communities.[25]

[24] Amarnath, G., Mweemba, C., & Manishimwe, E. (2022). Locally Led Climate Action for Sustainable Community Resilience. CGIAR Initiative on Climate Resilience. Retrieved from https://www.iwmi.cgiar.org/Publications/Other/PDF/locally_led_climate_action_for_sustainable_community_resilience.pdf

[25] Case Studies on Collaborative Climate Action from V-LED – Partnership for Collaborative Climate Action. Retrieved from https://collaborative-climate-action.org/case-studies-on-collaborative-climate-action-from-v-led/

Appraising Climate Change-Related Policies Concerning Community Leadership in Pakistan

National Adaptation Plan 2023 The National Adaptation Plan (NAP) 2023 emphasizes the importance of local solutions and the need for capacity building at the community level.[26] It highlights the necessity of equipping communities with knowledge and training related to climate disaster management and emphasizes the role of local leaders, health professionals, teachers, and community volunteers in raising awareness about climate change and disaster relief actions.[27] However, the NAP's capacity-building measures are largely focused on enhancing community resilience in post-disaster scenarios, rather than promoting community leadership in pre-disaster adaptation efforts. The plan acknowledges the importance of developing locally-tailored solutions through the engagement of community representatives but falls short in actively supporting community-led initiatives.

National Climate Change Policy 2021 The National Climate Change Policy (NCCP) 2021 outlines the vulnerabilities across various sectors, including water resources, agriculture, forestry, coastal areas, biodiversity, and fragile ecosystems. It proposes actions for international cooperation, technology transfer, institutional development, capacity building, and disaster preparedness.[28] The policy emphasizes the expansion of district and tehsil authorities' capacity to support community groups in promoting Disaster Risk Management (DRM) activities. It also calls for the establishment of new community organizations focused on DRM, where none exist, to adopt best practices for climate change adaptation.

The NCCP underscores the need to strengthen the skills and expertise of community organizations' leaders in areas such as financial management, resource mobilization, and social interactions. It highlights the importance of linking Community-Based Organizations (CBOs) with relevant local agencies to enhance disaster preparedness.[29] Furthermore, the policy acknowledges the gender dimension of climate change, noting that women and marginalized communities are disproportionately affected and have fewer resources to adapt. The policy calls for gender-sensitive adaptation measures and recognizes the increased burden on rural women involved in agriculture due to climate change.[30]

However, like other climate-related policies in Pakistan, the NCCP primarily focuses on post-disaster relief and recovery, with insufficient emphasis on resilience-building measures before disasters occur. There is a pressing need for policies that promote proactive, community-led solutions to climate change challenges.

[26] Ministry of Climate Change, Government of Pakistan. (2023). National Adaptation Plan of Pakistan 2023. Retrieved from https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf
[27] ibid
[28] Ministry of Climate Change, Government of Pakistan. (2021). National Climate Change Policy. Retrieved from https://mocc.gov.pk/SiteImage/Policy/NCCP%20Report.pdf
[29] https://policy.asiapacificenergy.org/node/4283
[30] Ministry of Climate Change, Government of Pakistan. (2021). National Climate Change Policy. Retrieved from https://mocc.gov.pk/SiteImage/Policy/NCCP%20Report.pdf

Strategies for Promoting Community Leadership in Pakistan

Mitigation and adaptation to climate change require participation at multiple levels, with local communities serving as the focal points for adaptation activities. Community leadership is crucial for maintaining the flow of knowledge between governments and communities, fostering opportunities for experimentation, learning, and the development of sustainable practices. Grassroots movements and bottom-up approaches are essential for creating innovative and context-specific adaptation strategies.[31]

Engaging local communities in leadership roles allows for the co-creation and implementation of climate solutions that are tailored to the unique cultural, social, and environmental contexts of Pakistan. By promoting community leadership, Pakistan can harness the extensive local knowledge and expertise that communities possess, leading to more effective and sustainable climate actions that resonate with the needs and aspirations of the people.

Capacity Building

The UN Framework Convention on Climate Change underscores the significance of *"education, training, public awareness, public participation, and public access to information"* as essential elements for both adapting to and mitigating the impacts of climate change.[32] Enhancing public knowledge about the causes and consequences of climate change is a crucial strategy for motivating citizens to engage with and address climate-related challenges. As Pakistan stands at the forefront of climate change impacts, it is imperative for the government to ensure widespread access to climate education and information. To achieve this, climate change should be integrated into the curricula at primary, secondary, and tertiary education levels, accompanied by the development of instructional materials and the training of educators.

The United States provides a model through its federal agencies, such as the Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA), which have implemented programs to advance environmental education and train educators. The EPA's initiatives support educators in teaching environmental topics, establish standards for certification and accreditation, and facilitate access to educational resources.[33] Similarly, the Federal Directorate of Education in Pakistan has initiated climate change learning sessions in government schools in Islamabad, but such efforts need to be scaled up, particularly in communities and areas that are most vulnerable to climate change effects.

To foster resilience at the grassroots level, community leaders and youth must be trained, with specialized programs aimed at building their capacity to spearhead community-based solutions. Non-governmental organizations (NGOs) and civil society coalitions should collaborate with stakeholders and the government to strengthen the leadership abilities of

[31] How small communities respond to environmental change: patterns from tropical to polar ecosystems patterns from tropical to polar ecosystems on JSTOR. (n.d.). www.jstor.org. Retrieved from https://www.jstor.org/stable/26270171

[32] Action for Climate Empowerment. United Nations Climate Change. Retrieved from https://unfccc.int/topics/education-and-youth/big-picture/ACE

[33] Environmental Education (EE) , US EPA. (2024, May 23). Retrieved from https://www.epa.gov/education

community leaders, thereby promoting resilience. These organizations can also play a crucial role in providing mentorship on technical matters to communities.

Public Awareness and Participation

Community participation is key to the effective exchange of climate expertise and knowledge between governments and communities. It is essential for the Government of Pakistan to establish effective channels for informing communities about the urgency of resilience planning. Building trust between the public and the government is vital to ensuring that information is received and acted upon. Awareness campaigns are necessary to educate communities about the impacts of climate change and the available mitigation strategies. Although communities may not fully understand the underlying causes or anticipate the long-term effects of the changes they are experiencing, they are often aware of climate-induced shifts in their environment. Education can bridge this gap by integrating expert knowledge into community-based adaptation initiatives.[34]

Well-informed communities are better equipped to anticipate local impacts, and disseminating knowledge can help mitigate the risk of elite capture of public investments. Community involvement and leadership are essential for strengthening grassroots environmental perspectives and social networks, facilitating the dissemination of ecological and scientific knowledge, and garnering broader support for conservation initiatives.[35] In this context, engaging local community leaders in public awareness campaigns is crucial, as they are best positioned to implement these initiatives within their communities.

Communities must be directly engaged in designing mitigation strategies to adapt to the effects of climate change. Public participation should be encouraged through workshops, seminars, and interactive platforms, with a strong emphasis on valuing the input of community leaders. Such engagements will not only enhance their understanding of technical and sustainability-related aspects of local initiatives but also empower them to more effectively implement community-based solutions.

Resource Allocation

Access to educational and financial resources is foundational to the success of community-based solutions. Creating enabling conditions for communities to actively participate in decision-making processes instils a sense of ownership and control over outcomes. Participatory budgeting and planning, which have evolved over the past three decades, provide a framework for governments and communities to collaboratively determine the allocation of resources and planning priorities. This approach, which originated in Porto Alegre, Brazil, in 1989, has since been adopted by municipalities worldwide and is particularly well-suited for addressing climate action at the local level.[36]

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[34] [34] Ayers, J., & Forsyth, T. (2009). Community-Based adaptation to climate change. Environment, 51(4), 22–https://doi.org/10.3200/env.51.4.22-31

[35] [35] Jimenez, M. F., Pejchar, L., & Reed, S. E. (2021). Tradeoffs of using place-based community science for urban biodiversity monitoring. Conservation Science and Practice, 3(2). https://doi.org/10.1111/csp2.338

[36] Gordon, V., Osgood, J., & Boden, D. (2016). Participatory budgeting in the United States. Routledge eBooks. https://doi.org/10.4324/9781315535296

Participatory budgeting empowers communities to influence government efforts on climate resilience by involving them in financial decision-making processes. For example, in Metz, France, community groups have successfully utilized participatory budgeting to launch significant climate initiatives. This approach enables the development of hyper-local actions that reflect a community's specific perceptions of risk and vulnerability, thereby fostering the creation of effective and sustainable interventions.

In addition to participatory budgeting, the allocation of grants, subsidies, and low-interest loans for climate resilience projects should be prioritized based on local needs. The government should also facilitate access to these resources for community-led projects, ensuring that technical and financial assistance is readily available to support local initiatives.[37]

Policy and Institutional Support

Policies addressing climate change must incorporate the perspectives of the general public and relevant constituencies. Local policies and programs should lead environmental innovation, with community leadership driving systemic reforms. Policy frameworks must be designed with a focus on fostering a culture rooted in ethical and sustainable principles. Governments should integrate local knowledge into their adaptation programs and policies, ensuring that communication channels between individuals, communities, and international organizations are robust and effective.

Incorporating local knowledge into planning processes allows for the identification of key local actors who need to be mobilized to secure broader community support. Engaging stakeholders at all stages of planning and implementation promotes individual and community ownership of initiatives, reduces resistance, and increases the likelihood of achieving desired outcomes.[38] Community input is particularly crucial in designing solutions that prioritize the protection of livelihoods, minimize property risks, and respect the cultural values of the community.

However, genuine community engagement requires more than just the dissemination of information. It demands deepened participation, where communities are fully aware of the hazards posed by climate change and are recognized as equal partners in mitigation and adaptation planning. True participation involves not only consultation but also active involvement in decision-making, implementation, and management of solutions. This can be achieved through direct community action or in collaboration with government agencies, universities, NGOs, and other stakeholders.

Institutional support is necessary to facilitate collaborations between the private sector, NGOs, INGOs, and community initiatives, thereby strengthening community leadership and enabling local solutions to combat climate change.[39]

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[37] Cohen, T. (2012). Can participatory emissions budgeting help local authorities to tackle climate change? Environmental Development, 2, 18–35. https://doi.org/10.1016/j.envdev.2012.03.016

[38] Ebi, K. L. (2009). Facilitating Climate Justice through Community-Based Adaptation in the Health Sector. Environmental Justice, 2(4), 191–195. https://doi.org/10.1089/env.2009.0031

[39] Restrepo-Mieth, A., Perry, J., Garnick, J., & Weisberg, M. (2023). Community-based participatory climate action. Global Sustainability, 6. https://doi.org/10.1017/sus.2023.12

Conclusion

Pakistan stands at a critical juncture, facing the severe and far-reaching impacts of global climate change. As one of the most vulnerable countries in the world, Pakistan is regularly afflicted by flash floods, droughts, heatwaves, and coastal erosion. These climate-induced disasters wreak havoc on local communities, leading to the degradation of agricultural lands, pollution of water sources, and the destruction of livelihoods. The repercussions extend beyond immediate physical damage, forcing communities into climate-induced migration as they lose their homes and face profound financial instability.

In this challenging landscape, community-based local solutions and initiatives are not just beneficial—they are essential for building resilience and equipping communities to adapt to the rapidly changing environment. Local-level adaptation and mitigation efforts empower the most vulnerable populations to respond proactively to the challenges posed by climate change, thereby reducing their reliance on external aid and enhancing their ability to sustain themselves in the face of adversity. Pakistan's potential for grassroots resilience is immense. However, this potential can only be fully realized through concerted efforts that integrate community-based initiatives with support from the private sector, non-governmental organizations (NGOs), and international organizations. These collaborations are crucial for scaling up local solutions, providing the necessary resources, and ensuring that resilience-building efforts are both sustainable and effective. Unfortunately, a significant gap remains in Pakistan's climate-related policies and adaptation plans. These frameworks predominantly address post-disaster responses, with insufficient emphasis on pre-disaster preparedness and proactive community engagement.

To truly protect its people and environment, Pakistan must adopt inclusive policies that actively involve local community leaders in the decision-making process. These leaders, who are often the first responders in times of crisis, possess invaluable local knowledge and can drive initiatives that are culturally relevant and contextually appropriate. Youth and women, in particular, hold the potential to be transformative agents of change within their communities. Their leadership is vital for fostering resilience, yet their ability to lead is contingent upon receiving adequate support, training, and opportunities from the government.

Education and awareness are foundational to these efforts. The government's role in promoting grassroots initiatives begins with ensuring that communities are well-informed about the causes, impacts, and potential solutions to climate change. Capacity-building programs are essential to equipping community leaders with the skills and knowledge needed to spearhead local initiatives. Additionally, facilitating collaborations between communities, government agencies, NGOs, and international partners is crucial for creating a robust support system that enables these initiatives to thrive. Ultimately, fostering a culture of community leadership in Pakistan is not just about responding to climate change but about transforming how communities engage with and address the challenges they face. It requires a paradigm shift from reactive to proactive approaches, with a strong emphasis on local empowerment and participatory governance. By investing in education, capacity building, and collaborative networks, Pakistan can lay the groundwork for a resilient future—one in which communities are not just surviving but thriving in the face of climate change.

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