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Climate Change Policy and Government Preparedness in Developing Economies

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ABSTRACT

Climate change presents a multidimensional governance challenge for developing economies because it intensifies natural hazards while interacting with poverty, weak infrastructure, fiscal limitations, rapid urbanization, food insecurity, and institutional fragmentation. Although many developing countries have adopted national climate policies, Nationally Determined Contributions, disaster-risk-reduction strategies, and adaptation plans, the existence of policy documents does not necessarily indicate operational preparedness. Government preparedness depends on institutional coordination, reliable climate information, early-warning systems, resilient public infrastructure, trained personnel, inclusive local participation, adequate financing, and the integration of climate risk into routine development planning. This article examines the relationship between climate change policy and government preparedness in developing economies through a qualitative review of international policy frameworks, institutional evidence, and recent studies from Pakistan, South Asia, Africa, and other low- and middle-income regions. It argues that the central challenge is no longer merely the absence of climate policy but the persistent gap between policy formulation and implementation. Limited administrative capacity, fragmented responsibilities, dependence on external finance, insufficient local-government authority, weak monitoring systems, and unequal public participation frequently prevent national commitments from producing measurable resilience. The article proposes a preparedness-oriented policy framework based on legally defined institutional mandates, climate-responsive public budgeting, multi-hazard early-warning systems, resilient infrastructure, adaptive social protection, locally led planning, nature-based solutions, transparent monitoring, and stronger international cooperation.

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Introduction:

Climate change has moved from being a long-term environmental concern to becoming an immediate public-policy, economic-development, and human-security challenge. Rising temperatures, changing rainfall patterns, floods, droughts, heat waves, cyclones, wildfires, coastal erosion, and water shortages increasingly affect agricultural production, public health, infrastructure, employment, migration, education, and fiscal stability. The Intergovernmental Panel on Climate Change emphasizes that climate-resilient development requires the integration of adaptation and mitigation with sustainable development, supported by coordinated institutions, inclusive governance, finance, knowledge, and international cooperation. Developing economies are particularly exposed because climate hazards interact with existing structural vulnerabilities. These include widespread poverty, informal employment, dependence on climate-sensitive agriculture, inadequate housing, unplanned urban settlements, limited public-health services, weak water-management systems, and restricted fiscal capacity. The effects of a climatic event are therefore determined not only by the physical intensity of the hazard but also by the level of social vulnerability, institutional preparedness, and government capacity to anticipate and manage the resulting disruption. International frameworks provide an important policy foundation. The Paris Agreement requires countries to communicate progressively ambitious climate actions through Nationally Determined Contributions and recognizes both emission reduction and adaptation as central components of national climate policy. The Sendai Framework for Disaster Risk Reduction similarly encourages governments to understand disaster risk, strengthen governance, invest in resilience, and improve preparedness. Together, these frameworks support the integration of climate policy, disaster-risk reduction, and sustainable development. Nevertheless, there is a substantial difference between policy adoption and actual preparedness. A government may publish an adaptation plan while lacking the budget, personnel, data, legal authority, institutional coordination, or local implementation arrangements necessary to execute it. Preparedness must therefore be assessed through practical capabilities: whether risks are mapped, warnings reach vulnerable communities, infrastructure standards reflect future climate conditions, emergency institutions are operational, local governments have resources, and public budgets protect priority adaptation programmers. This article uses a qualitative policy-review approach to examine climate preparedness in developing economies. It draws upon international climate and disaster-risk frameworks, multilateral reports, and research on institutional capacity, public participation, nature-based adaptation, and multi-level governance. Pakistan is used as an important illustrative case because it combines high climate exposure with significant governance, infrastructure, agricultural, urban, water, and fiscal challenges. The central argument is that effective preparedness requires climate considerations to be embedded throughout government rather than confined to environmental ministries.

Climate Vulnerability and the Policy Context of Developing Economies:

Climate vulnerability in developing economies is produced by the interaction of exposure, sensitivity, and adaptive capacity. Exposure refers to the presence of people, infrastructure, economic activities, and ecosystems in hazard-prone areas. Sensitivity concerns the degree to which these systems are affected, while adaptive capacity refers to their ability to anticipate, absorb, respond to, and recover from climate impacts. Low-income households generally have fewer savings, weaker insurance protection, insecure employment, and limited access to public services, making recovery slower and more unequal. Agriculture illustrates this vulnerability. Farmers in developing economies frequently depend on rainfall, small landholdings, informal credit, and limited extension services. Drought, flooding, changing growing seasons, heat stress, and pest outbreaks can reduce yields and household income. These effects spread beyond farms by increasing food prices, reducing rural employment, weakening exports, and raising government expenditure on relief and food assistance. Similar relationships exist in fisheries, water supply, public health, hydropower, transport, and urban housing.National climate policies commonly address these risks through adaptation plans,

emission-reduction targets, sectorial strategies, and disaster-management frameworks. However, policy objectives are frequently broad, with limited detail regarding responsible institutions, measurable indicators, funding sources, implementation schedules, or enforcement mechanisms. Climate policy may also be developed separately from economic planning, infrastructure investment, agricultural policy, urban development, public health, and social protection. Pakistan's Country Climate and Development Report, for example, treats climate resilience as an economy-wide development challenge involving agriculture and food systems, cities, energy, transport, human capital, social protection, governance, and climate finance. This approach demonstrates that climate policy cannot be effective when treated as an isolated environmental responsibility.The policy context is also shaped by competing development priorities. Governments must finance education, health, energy, employment, security, debt servicing, and infrastructure while responding to immediate political pressures. Adaptation investments may be postponed because their benefits are often preventive and become visible only when future losses are avoided. Political incentives can therefore favor short-term relief and highly visible construction projects over long-term risk reduction, maintenance, environmental restoration, or institutional reform.A preparedness-oriented climate policy should establish clear legal mandates, identify priority risks, define financing arrangements, and connect national goals to sectorial and local implementation. Policies should specify how ministries, disaster-management agencies, meteorological institutions, provincial authorities, municipalities, private organizations, researchers, and communities will cooperate. Without these operational arrangements, ambitious climate commitments may remain disconnected from the institutions responsible for implementation.

Institutional Capacity, Coordination, and Multi-Level Governance:

Institutional capacity is one of the strongest determinants of government preparedness. It includes legal authority, administrative competence, trained personnel, financial resources, technical knowledge, data systems, organizational continuity, and the ability to coordinate across departments. Climate change challenges traditional administrative structures because its effects cross jurisdictional and sectorial boundaries. Responsibilities for climate adaptation are usually distributed among environmental ministries, disaster-management authorities, finance departments, planning commissions, agricultural agencies, municipal governments, water authorities, health departments, and infrastructure regulators. When institutional mandates overlap or remain unclear, agencies may duplicate work, delay decisions, compete for resources, or assume that another institution is responsible.Research on public institutions in Punjab, Pakistan, found important limitations in financial, physical, and human-resource capacity for climate adaptation and agricultural risk-management support. The study also examined climate knowledge, training, coordination, and resource availability, demonstrating that formal institutional existence does not necessarily translate into operational capacity. Multi-level governance is equally important. National governments may develop climate policies, but many preparedness functions are implemented locally. Municipalities regulate land use, drainage, building safety, waste management, roads, local health services, water supply, emergency shelters, and community communication. However, local governments in developing economies frequently have insufficient revenue, limited technical expertise, outdated risk information, and restricted authority.Evidence from Saint-Louis, Senegal, shows that climate adaptation requires coordination across national and local levels, as well as cooperation between public agencies and communities. Gaps between formally prescribed governance arrangements and actual implementation can reduce the effectiveness of flood-risk management and urban resilience. Governments should establish permanent inter-ministerial climate-resilience structures with clearly defined responsibilities. Such structures need authority to review public investment proposals, coordinate sectorial plans, resolve institutional conflicts, and monitor implementation. Climate focal persons should not be isolated junior officials; they should be connected to senior decision-making, budget preparation, planning, and

performance-management systems.Institutional continuity must also be protected from frequent political and administrative changes. Climate adaptation requires long-term planning extending beyond electoral cycles. National climate legislation, medium-term budget commitments, professional civil-service units, independent technical assessments, and publicly available performance indicators can reduce the disruption caused by changing governments.

Early-Warning Systems, Resilient Infrastructure, and Emergency Preparedness:

Multi-hazard early-warning systems are among the most practical components of government preparedness. An effective system includes risk knowledge, observation and forecasting, warning communication, and the capacity of institutions and communities to act. A warning has limited value when it is issued too late, uses inaccessible language, fails to reach remote communities, or is not connected to evacuation routes, shelters, emergency services, and public trust. The World Meteorological Organization reported in 2025 that 119 countries, representing approximately 60 percent of all countries, reported having a multi-hazard early-warning system. Nevertheless, significant gaps remained, particularly among small island developing states, while Africa continued to record the lowest overall system scores despite substantial progress.Developing economies should invest in meteorological observation, hydrological monitoring, satellite services, forecasting models, emergency communication, mobile alerts, community radio, sirens, and locally understandable warning messages. Systems must cover multiple risks, including floods, droughts, heat waves, cyclones, landslides, wildfires, glacial-lake outburst floods, and disease outbreaks. Preparedness also depends on the resilience of public infrastructure. Roads, bridges, schools, hospitals, power systems, irrigation networks, drainage systems, water facilities, and telecommunications should be designed using future climate projections rather than historical averages alone. Infrastructure that cannot withstand extreme heat, heavier rainfall, flooding, or water scarcity may create repeated fiscal liabilities.Governments should require climate-risk screening for major public investments. Environmental-impact assessments should be expanded to include climate vulnerability, lifecycle resilience, maintenance requirements, and potential maladaptation. Building codes, zoning rules, floodplain regulations, drainage standards, and urban-development plans must be enforced rather than merely adopted. Nature-based solutions can complement engineered infrastructure. Wetlands can absorb floodwater, mangroves can reduce coastal exposure, forests can stabilize slopes and watersheds, and urban green spaces can reduce heat. A systematic assessment of adaptation interventions in developing countries found particularly strong positive effects associated with nature-based solutions in agricultural and coastal contexts.Emergency preparedness should include regularly updated contingency plans, trained response teams, emergency stockpiles, evacuation exercises, health-surveillance systems, resilient shelters, and arrangements for protecting women, children, older persons, persons with disabilities, migrants, and other vulnerable groups. Preparedness exercises should test real coordination among agencies instead of remaining ceremonial activities. Recovery planning is equally important. Post-disaster reconstruction should follow a “build back better” approach, using improved construction standards and updated hazard information. Rebuilding the same vulnerable infrastructure in the same exposed locations reproduces risk and increases future losses.

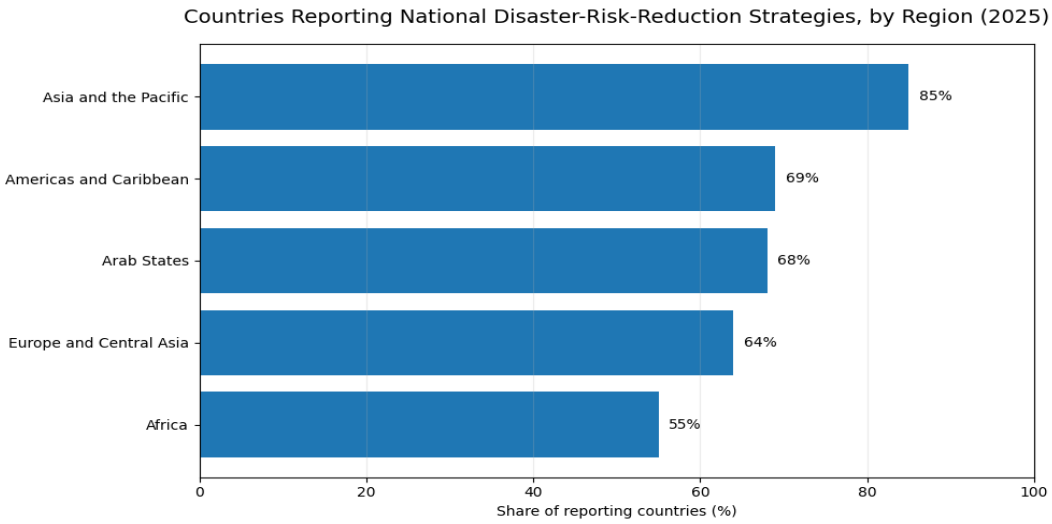
Climate Finance, Public Budgeting, and the Implementation Gap:

The shortage and structure of climate finance remain major barriers to preparedness. UNEP estimated that developing countries could require approximately US$310–365 billion annually for adaptation by 2035, while international public adaptation finance reaching developing countries was approximately US$26 billion in 2023. This difference illustrates the scale of the adaptation-finance gap. External finance is important, but government preparedness cannot depend entirely on international grants or temporary donor projects. Donor-dependent programmers may be fragmented, geographically limited, administratively complex, and difficult to sustain after external funding ends. Governments should therefore integrate climate resilience into domestic taxation, public expenditure, debt management, development planning, and

financial regulation.Climate-budget tagging can identify adaptation and mitigation expenditure across ministries. However, tagging should not become an accounting exercise that labels conventional development spending as climate finance without demonstrating additional resilience benefits. Expenditure should be linked to measurable outcomes such as reduced exposure, improved warning coverage, resilient infrastructure, protected water supply, lower disaster mortality, or increased household adaptive capacity. Finance ministries should apply climate-risk analysis to medium-term expenditure frameworks, public-investment management, fiscal-risk statements, state-owned enterprises, and infrastructure procurement. Contingent liabilities from disasters should be estimated, and governments should establish emergency reserves, insurance arrangements, catastrophe financing, or pre-arranged credit facilities where appropriate. Transparent procurement is essential because emergency and infrastructure spending can be vulnerable to inefficiency, political influence, and corruption. Public disclosure of project selection, contractors, budgets, implementation progress, and resilience indicators can improve accountability. Independent audits and parliamentary oversight should assess not only whether money was spent but whether the expenditure reduced climate risk. The distribution of finance also matters. National institutions frequently retain a large share of adaptation funding even though local governments and communities implement many preparedness activities. Clear fiscal-transfer mechanisms should provide municipalities with predictable resources based on exposure, vulnerability, population, poverty, and infrastructure deficits.Pakistan's climate-resilient WASH challenges demonstrate how fragmented governance, infrastructure weaknesses, and dependence on donor finance can restrict preparedness. Recent policy research recommends stronger national coordination and community-led approaches to improve the resilience of water, sanitation, and hygiene systems.

A Policy Framework for Strengthening Government Preparedness:

A comprehensive preparedness framework for developing economies should be built around prevention, readiness, response, recovery, and institutional learning.First, climate resilience should be established as a whole-of-government responsibility. National climate legislation should define the responsibilities of ministries, provincial authorities, municipalities, regulators, and disaster-management agencies. Climate goals should be incorporated into national development plans, sectorial strategies, annual budgets, and public-sector performance agreements.Second, governments should develop integrated national risk-information systems. These systems should combine meteorological, hydrological, environmental, demographic, health, agricultural, infrastructure, and socioeconomic data. Risk maps must be updated regularly and made accessible to planners, local governments, researchers, businesses, and the public.Third, preparedness should be decentralized with adequate resources. Local authorities require legal authority, technical staff, reliable transfers, training, and access to climate information. Decentralization without resources merely transfers responsibility without increasing capacity.Fourth, public participation should move beyond consultation. Communities should participate in identifying risks, selecting adaptation priorities, monitoring projects, and evaluating outcomes. Research from coastal South Asia indicates that participation can improve community cohesion and adaptation outcomes, but it can also be undermined by elite capture, externally controlled processes, token consultation, and unclear responsibilities.Fifth, governments should prioritize nature-based and hybrid adaptation measures where evidence demonstrates their effectiveness. Ecosystem restoration should be treated as infrastructure investment because healthy watersheds, forests, wetlands, coastal vegetation, and urban green spaces provide measurable protection and development benefits.Sixth, preparedness should be linked to social justice. Climate risks are unevenly distributed, and adaptation policies can unintentionally transfer costs to vulnerable groups. Relocation programmers, water pricing, carbon taxation, infrastructure construction, and conservation measures should include social-impact assessment, compensation, livelihood restoration, and grievance mechanisms.



Source: UNDRR, 2025 Global Status of National Disaster Risk Reduction Strategies. Percentages reflect countries reporting through the Sendai Framework Monitor.

Summary:

Climate change policy and government preparedness are closely connected but not identical. Climate policies establish goals, priorities, and institutional direction, whereas preparedness reflects whether governments possess the practical capacity to anticipate hazards, protect people, maintain essential services, respond effectively, and recover without reproducing vulnerability.Developing economies have made substantial progress in adopting climate policies, disaster-risk strategies, adaptation plans, and international commitments. Nevertheless, implementation remains constrained by limited finance, fragmented institutions, insufficient local capacity, weak infrastructure, inadequate data, unequal participation, and short-term political incentives. Consequently, the most significant policy challenge is frequently not the complete absence of plans but the inability to convert plans into funded, coordinated, and measurable action. Effective preparedness requires climate risk to be integrated into economic planning, public budgeting, infrastructure regulation, land-use management, agriculture, health, water governance, education, and social protection. National governments must provide strategic direction, but local governments and communities require resources and authority because climate impacts occur in particular places and affect groups differently. Early-warning systems, resilient infrastructure, nature-based solutions, adaptive social protection, institutional coordination, and transparent climate finance should form the operational foundation of preparedness. Policies must also protect vulnerable communities from maladaptation, exclusion, displacement, and unequal financial burdens.

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