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Local Government Capacity in Climate Change Policy Implementation: A Literature Review

Liam Miguel Santos[1], Sofia Mae Reyes[1], Ethan Gabriel Cruz[1]

[1]Xavier University – Ateneo de Cagayan, Philippines

*Corresponding Author: Liam Miguel Santos

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Abstract

Climate change policy implementation increasingly depends on the capacity of local governments to translate national and regional policy commitments into context-specific actions. However, the implementation of climate policies at the local level remains constrained by institutional, financial, technical, political, and organizational challenges. This study aims to examine the dimensions of local government capacity that influence climate change policy implementation and to identify the major barriers, capacity-building strategies, and research gaps reported in the existing literature. This study employs a qualitative literature review approach by systematically synthesizing relevant academic literature concerning local government capacity and climate governance. The findings indicate that local government capacity is multidimensional, encompassing institutional and administrative capacity, human resource and technical capacity, financial capacity, political and leadership capacity, coordination and collaborative capacity, information and knowledge capacity, and monitoring and learning capacity. The review further identifies limited financial resources, inadequate technical expertise, institutional fragmentation, weak intergovernmental coordination, limited access to localized climate information, political uncertainty, and weak monitoring systems as major barriers to effective implementation. The findings also demonstrate that capacity-building interventions are most effective when they integrate institutional strengthening, human resource development, climate-responsive financing, collaborative governance, knowledge management, and adaptive learning. The study concludes that strengthening local government capacity requires a systemic and context-sensitive approach rather than isolated interventions. Future research should develop multidimensional capacity frameworks and examine the relationship between local government capacity and measurable climate policy outcomes, particularly in developing-country contexts.

Introduction

Climate change has emerged as one of the most significant governance challenges of the twenty-first century, affecting environmental systems, economies, public health, infrastructure, and social welfare across different levels of society. Although climate change is global in scope, its impacts are experienced most directly at the local and community levels. Local governments are therefore increasingly recognized as critical actors in translating national climate commitments and international agreements into concrete actions (Pamungkas et al., 2024). Their responsibilities often include spatial planning, environmental management, infrastructure development, disaster risk reduction, public transportation, waste management, energy efficiency, and the protection of vulnerable communities (Farinós-Dasí et al, 2025). However, the ability of local governments to perform these functions varies considerably according to their institutional arrangements, financial resources, technical expertise, political leadership,

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and relationships with other governmental and non-governmental actors. Consequently, understanding local government capacity has become essential for explaining why climate change policies are implemented effectively in some local contexts but remain limited or fragmented in others (Rezvani et al., 2023).

The implementation of climate change policy requires more than the existence of appropriate laws, strategies, and policy commitments. Policies must be translated into programs, budgets, organizational procedures, partnerships, and measurable actions at the local level. This process is particularly challenging because climate change is characterized by uncertainty, long time horizons, cross-sectoral impacts, and complex interactions between environmental, economic, and social systems (Lamichhane et al, 2022; Sparkes et., 2026). Local governments must simultaneously respond to immediate development priorities while addressing climate risks whose consequences may become more severe over time. In many developing countries, these challenges are compounded by limited fiscal autonomy, shortages of skilled personnel, inadequate infrastructure, weak institutional coordination, and insufficient access to reliable climate information. As a result, the gap between policy formulation and implementation frequently reflects differences in governmental capacity rather than differences in the formal quality of climate policies (Juschte et al., 2025).

Local government capacity can be understood as the ability of public institutions to mobilize resources, develop policies, coordinate stakeholders, implement programs, and learn from policy outcomes. In the context of climate change, this capacity is inherently multidimensional (Khan & Han, 2023). Administrative and institutional capacity enables governments to establish clear responsibilities and organizational mechanisms for climate action. Human resource and technical capacity provide the expertise required to understand climate risks and design appropriate interventions. Financial capacity determines whether planned programs can be adequately funded and sustained. Political and leadership capacity influences the extent to which climate issues receive attention within competing local policy priorities (Abutabenjeh et al., 2024). Meanwhile, coordination and collaborative capacity allow local governments to work across administrative boundaries and organizational sectors. Knowledge, information, monitoring, and evaluation capacity further support evidence-based decision-making and institutional learning (Links & Draai, 2023). These dimensions are not independent; rather, their interaction determines the overall ability of local governments to implement climate policies effectively.

The importance of local government capacity is particularly evident in climate change adaptation. Adaptation measures are often highly context-specific because climate risks differ according to geography, socioeconomic conditions, infrastructure, ecosystems, and patterns of community vulnerability (Eckhard & Parizek, 2022). Local governments are generally better positioned than national institutions to identify local risks, engage affected communities, and integrate adaptation priorities into development planning. However, effective adaptation requires technical knowledge, reliable data, financial resources, participatory mechanisms, and institutional coordination. Weakness in any of these areas can undermine implementation (Sumkoski et al., 2025). For example, a local government may have a comprehensive climate adaptation plan but lack sufficient personnel or funding to implement it. Similarly, technical expertise may exist within an organization but remain underutilized because institutional responsibilities are fragmented across departments (Mohammad et al., 2025).

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Local governments also play an increasingly important role in climate change mitigation. Urban areas and local economies contribute substantially to greenhouse gas emissions through transportation, energy consumption, construction, waste generation, and land-use practices. Local authorities can influence these areas through sustainable urban planning, public transportation policies, renewable energy initiatives, waste reduction programs, energy-efficient public facilities, and environmental regulations. Nevertheless, the effectiveness of such measures depends heavily on administrative authority, financial resources, political commitment, technical capacity, and cooperation with private-sector and community actors. This demonstrates that climate policy implementation is not simply a matter of adopting environmental policies; it requires institutional capabilities that allow governments to coordinate multiple interests and sustain action over time (Schoenefeld et al., 2022; Meckling & Nahm, 2022; Hale, 2024).

Despite the growing recognition of local governments in climate governance, the literature remains fragmented regarding how different dimensions of local capacity interact to influence policy implementation David et al. (2023). Existing studies frequently examine individual aspects such as financial resources, institutional arrangements, leadership, technical expertise, or stakeholder participation. While these contributions are valuable, focusing on isolated dimensions may overlook the interconnected nature of governmental capacity Retnandari (2022). A local government with adequate financial resources, for instance, may still experience implementation difficulties if it lacks technical personnel or effective coordination mechanisms (Pasape & Godson, 2022). Conversely, strong leadership and community networks may partially compensate for resource limitations by facilitating collaboration and mobilizing external support. A systematic synthesis is therefore needed to understand capacity as a broader and multidimensional phenomenon.

This literature review addresses this gap by examining existing scholarship on local government capacity in climate change policy implementation. The review focuses on the major dimensions of capacity, the factors that strengthen or constrain implementation, and the strategies identified in the literature for improving local governmental performance (Tugyetwena, 2023). Attention is given to institutional, administrative, financial, human resource, political, coordination, knowledge, and monitoring capacities, as well as the influence of broader governance and socioeconomic contexts (Boufounou et al., 2024). By bringing these strands of literature together, the review seeks to provide a more integrated understanding of how local governments can develop the capabilities necessary to translate climate commitments into effective local action (Jasiyah & Suriadi, 2026).

Ultimately, strengthening local government capacity is essential for closing the implementation gap between climate policy commitments and outcomes. Climate governance cannot rely solely on national policies or international commitments because the effectiveness of these commitments depends substantially on the institutional capabilities of actors responsible for implementation. A stronger understanding of local government capacity can therefore contribute to both academic debates and practical policymaking by identifying the institutional conditions that support effective climate action (Susskind & Kim, 2022). This review provides a foundation for future empirical research and for the development of capacity-building strategies that enable local governments to respond more effectively, inclusively, and sustainably to the growing challenges of climate change (Durokifa et al., 2023; Edoun et al., 2023).

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Method

Research Design

This study employed a literature review approach to systematically examine and synthesize existing scholarly research on local government capacity in climate change policy implementation. A literature review was selected because the purpose of the study was not to collect primary empirical data, but to identify, compare, and critically synthesize existing knowledge regarding the institutional, administrative, financial, technical, political, and collaborative capacities required by local governments to implement climate change policies effectively. The review focused on peer-reviewed academic literature addressing local climate governance, governmental capacity, climate policy implementation, adaptation, mitigation, and multilevel governance.

Review Scope and Research Questions

The review was guided by a set of research questions concerning the dimensions, determinants, barriers, and strategies associated with local government capacity for climate change policy implementation. The review specifically examined: (1) how local government capacity is conceptualized in the existing literature; (2) what dimensions of capacity are considered important for climate policy implementation; (3) what institutional, political, financial, and socioeconomic factors influence local government capacity; (4) what barriers constrain local implementation; and (5) what strategies have been proposed to strengthen local government capacity. These questions provided a structured basis for identifying relevant studies and organizing the findings into thematic categories.

Literature Search Strategy

The literature search was conducted using major academic databases and scholarly search platforms, including Scopus, Web of Science, ScienceDirect, and Google Scholar. The search strategy combined keywords and Boolean operators related to the main concepts of the study. Search terms included combinations of *"local government capacity," "local government capability," "climate change policy," "climate policy implementation," "local climate governance," "climate adaptation," "climate mitigation," "institutional capacity,"* and *"multilevel climate governance."* The search strategy was designed to capture studies that explicitly examined local governmental capacity as well as studies that discussed specific capacity dimensions relevant to climate policy implementation.

Inclusion and Exclusion Criteria

Studies were selected according to predefined inclusion and exclusion criteria. Articles were included when they were published in peer-reviewed academic journals, addressed local or subnational government involvement in climate change governance, and provided substantive discussion of governmental capacity, policy implementation, adaptation, mitigation, or related governance mechanisms. Studies published in English were prioritized to facilitate consistency in analysis. Articles were excluded when they focused exclusively on national or international climate governance without meaningful consideration of local government, did not address policy implementation or capacity-related issues, or were not sufficiently relevant to the research questions. Duplicate publications and studies with insufficiently relevant content were also removed from the review.

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Study Selection Process

The study selection process was conducted in several stages. First, potentially relevant publications were identified through database searches using the predetermined keywords. Second, duplicate records were removed. Third, the titles and abstracts of the remaining publications were screened to determine their relevance to the research objectives. Studies that appeared relevant were subsequently examined through full-text assessment. At this stage, publications were evaluated against the established inclusion and exclusion criteria. Only studies that demonstrated clear relevance to local government capacity and climate change policy implementation were retained for the final synthesis. This process helped ensure that the literature included in the review was directly aligned with the research questions.

Data Extraction

Relevant information was systematically extracted from the selected studies using a structured data-extraction framework. The extracted information included the author and publication year, geographical context, research objective, methodological approach, conceptual or theoretical framework, dimensions of local government capacity examined, major implementation challenges, key findings, and recommendations. Attention was given to evidence concerning institutional capacity, financial capacity, human resource capacity, technical capacity, political leadership, coordination, stakeholder participation, knowledge management, and monitoring and evaluation. Organizing the extracted information in this manner enabled comparisons across studies and supported the identification of recurring themes and differences in the literature.

Data Analysis and Thematic Synthesis

The selected literature was analyzed using thematic synthesis. The analysis involved identifying recurring concepts, arguments, findings, and capacity dimensions across the reviewed studies. Initially, relevant statements and findings were coded according to their substantive content. Similar codes were then grouped into broader categories representing major dimensions of local government capacity. These categories were subsequently compared across studies to identify common patterns, differences, contextual influences, and emerging issues. The synthesis focused not only on summarizing individual studies but also on establishing relationships among different dimensions of capacity and explaining how they collectively influence climate policy implementation.

Quality Assessment

The methodological and substantive quality of the selected literature was considered during the review process. Greater attention was given to studies published in established peer-reviewed journals and studies that clearly articulated their research objectives, methods, data sources, analytical procedures, and findings. Studies with limited methodological transparency were treated cautiously during interpretation. Quality assessment was used to strengthen the credibility of the synthesis and reduce the possibility that conclusions would be disproportionately influenced by weak or poorly documented studies.

Synthesis and Presentation of Findings

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The findings were synthesized narratively and organized according to the major themes identified through the review. The synthesis began with the conceptualization of local government capacity and subsequently examined its major dimensions, determinants, implementation barriers, and capacity-building strategies. Where appropriate, findings were compared across different geographical and institutional contexts to identify similarities and differences. The final synthesis was used to develop an integrated conceptual understanding of how local government capacity contributes to effective climate change policy implementation and to identify gaps that warrant further empirical investigation.

Result and Discussion

Overview of the Reviewed Literature

The literature review identified a consistent body of research emphasizing the importance of local government capacity in translating climate change policies into practical programs and actions. Across the reviewed literature, local governments are positioned as important implementation actors because climate change policies frequently require action at the subnational level. Responsibilities related to climate adaptation, disaster risk reduction, environmental management, infrastructure, spatial planning, transportation, waste management, public services, and community resilience are often implemented through local government institutions. The reviewed literature therefore demonstrates that the effectiveness of climate change policy implementation is closely associated with the organizational ability of local governments to plan, coordinate, finance, implement, and monitor climate-related interventions.

The synthesis further indicates that local government capacity is conceptualized in the literature as a multidimensional construct. Rather than being limited to administrative resources, capacity encompasses institutional arrangements, human resources, technical expertise, financial resources, political leadership, coordination mechanisms, information and knowledge systems, and monitoring and evaluation processes. The reviewed studies differ in their emphasis, but these dimensions repeatedly appear as important elements of local climate governance. Some studies primarily emphasize institutional and administrative arrangements, while others focus on financial constraints, technical expertise, political leadership, collaborative governance, or the availability of climate information. Taken together, these studies demonstrate that local government capacity encompasses both internal organizational resources and the ability to mobilize resources and support from actors outside the government organization.

A further pattern identified in the literature is the relationship between local government capacity and the implementation gap. Several studies indicate that the existence of climate policies, strategies, or action plans does not necessarily result in effective implementation. Local governments may have formal responsibilities and policy frameworks but experience difficulties in translating these frameworks into operational programs. The most frequently identified implementation constraints include insufficient financial resources, limited technical expertise, unclear institutional responsibilities, weak coordination, limited access to localized climate information, and inconsistent political commitment. These findings are summarized in Table 1.

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Table 1. Summary of Major Findings in the Reviewed Literature

Dimension	Main Elements Identified	Relevance to Climate Policy Implementation
Institutional and administrative capacity	Institutional structures, clear mandates, procedures, planning systems	Supports policy coordination and integration
Human resource capacity	Skilled personnel, training, professional expertise	Supports policy design and program implementation
Technical capacity	Climate assessment, technical knowledge, project development	Enables technically appropriate climate interventions
Financial capacity	Local budgets, fiscal resources, external financing	Provides resources for adaptation and mitigation
Political and leadership capacity	Political commitment, leadership, prioritization	Determines strategic attention and resource allocation
Coordination and collaboration	Interdepartmental, intergovernmental, and stakeholder cooperation	Supports integrated implementation
Information and knowledge capacity	Climate data, scientific information, local knowledge	Supports evidence-based planning
Monitoring and evaluation capacity	Indicators, evaluation, feedback mechanisms	Supports assessment and policy improvement

Dimensions of Local Government Capacity

The reviewed literature identifies institutional and administrative capacity as one of the most frequently discussed dimensions of local government capacity. This dimension includes the existence of appropriate organizational structures, clear mandates, administrative procedures, planning mechanisms, and institutional responsibilities. The literature shows that climate change policy implementation frequently involves several government sectors simultaneously. Consequently, local governments require institutional arrangements capable of integrating climate objectives across environmental management, infrastructure, spatial planning, disaster management,

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transportation, health, and economic development. Where institutional responsibilities are unclear or fragmented, implementation tends to become sectoral and disconnected.

The second major dimension concerns human resource and technical capacity. The literature consistently identifies the availability of qualified personnel and specialized expertise as important requirements for implementing climate policies. Local government personnel may be required to conduct climate-risk assessments, develop adaptation strategies, prepare mitigation programs, interpret climate information, design projects, manage implementation, and evaluate outcomes. The reviewed studies indicate that shortages of specialized personnel can limit the ability of local governments to transform broad policy objectives into technically feasible interventions. Training, professional development, knowledge-sharing mechanisms, and access to external technical expertise are therefore frequently identified as important components of local capacity.

Financial capacity represents another major dimension identified in the literature. Climate change adaptation and mitigation programs often require substantial financial resources, particularly for infrastructure, technology, environmental management, disaster preparedness, and public services. The reviewed literature indicates that local governments with limited fiscal resources face greater difficulties in implementing ambitious climate programs. Financial capacity includes not only the availability of local government budgets but also fiscal flexibility, budgetary management, project preparation, and the ability to access external financing. National transfers, development assistance, climate finance, private investment, and partnerships are frequently identified as potential complementary sources of funding.

The literature also identifies political and leadership capacity as an important determinant of local climate action. Political leaders influence the extent to which climate change is prioritized within local development agendas, how resources are allocated, and whether government departments cooperate in implementation. The reviewed studies indicate that political commitment can facilitate the adoption and implementation of climate programs. However, changes in political leadership and competition between long-term climate priorities and short-term development demands can affect policy continuity.

Another recurring dimension is coordination and collaborative capacity. Climate change involves multiple sectors, administrative levels, and societal actors. The literature therefore highlights the importance of coordination among local government departments, as well as vertical coordination between national, regional, and local governments. Collaboration with communities, civil society organizations, universities, research institutions, private-sector actors, and development organizations is also identified as an important source of technical knowledge, financial resources, innovation, and local information.

Information and knowledge capacity constitutes an increasingly important dimension. Local governments require reliable information concerning climate hazards, vulnerability, exposure, emissions, infrastructure, population characteristics, and socioeconomic conditions. The reviewed literature identifies limited access to localized climate data as a recurring constraint. Digital technologies, geographic information systems, climate information platforms, and data-sharing mechanisms are identified as potential tools for improving the availability and use of climate information.

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Finally, monitoring, evaluation, and institutional learning capacity are identified as important elements of effective climate governance. The literature indicates that implementation requires mechanisms for tracking programs, measuring outcomes, evaluating performance, and incorporating lessons into subsequent policy decisions. However, monitoring systems in some local government contexts remain focused primarily on activities and expenditures rather than long-term climate outcomes. Table 2 summarizes the dimensions identified through the literature synthesis.

Table 2. Dimensions of Local Government Capacity Identified in the Literature

Capacity Dimension	Key Components	Typical Capacity Indicators
Institutional and administrative	Organizational structure, mandates, procedures, planning	Clear responsibilities, policy integration, administrative coordination
Human resources	Personnel, skills, training, professional development	Availability of qualified staff and continuous training
Technical	Climate expertise, risk assessment, project design	Technical knowledge and ability to develop climate programs
Financial	Budget, fiscal autonomy, external funding	Adequate funding and capacity to mobilize resources
Political and leadership	Commitment, leadership, prioritization	Political support and continuity of climate priorities
Coordination and collaboration	Government networks, partnerships, stakeholder engagement	Cross-sectoral and multilevel cooperation
Information and knowledge	Climate data, research, digital systems	Availability and use of reliable local climate information
Monitoring and learning	Evaluation, indicators, feedback, institutional learning	Outcome monitoring and policy adjustment

The synthesis indicates that the eight dimensions presented in Table 2 constitute the principal capacity areas identified across the literature. Institutional, human resource, technical, and financial capacities are primarily associated with the internal ability of local governments to undertake climate-related functions. Political, collaborative, information, and learning capacities extend this capability by supporting coordination, knowledge use, stakeholder engagement, and continuous improvement.

Barriers to Climate Change Policy Implementation

The literature identifies several recurring barriers that limit the ability of local governments to implement climate change policies effectively. The most frequently reported barrier is limited financial capacity. Local governments often face competing demands for public expenditure, making it difficult to allocate sufficient resources to climate programs whose benefits may occur over longer periods. Limited fiscal autonomy can further restrict the ability of local governments to respond independently to climate risks. Where external climate finance is available, local governments may nevertheless encounter difficulties in accessing such resources because of limited project-development and financial-management capacity.

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A second major barrier is limited human and technical expertise. The reviewed literature indicates that local government personnel may lack specialized knowledge in climate risk assessment, adaptation planning, emissions reduction, climate finance, and resilient infrastructure. This limitation affects both policy formulation and implementation. Technical capacity constraints can also reduce the ability of local governments to prepare high-quality project proposals, utilize climate data, and evaluate program outcomes.

Institutional fragmentation and weak coordination represent another recurring barrier. Climate responsibilities are often distributed among multiple government departments and administrative levels. When coordination mechanisms are weak, different institutions may pursue separate programs without sufficient integration. This can result in duplication, gaps in implementation, or conflicting priorities. Weak vertical coordination may also create inconsistencies between national climate objectives and local development priorities.

The literature further identifies limited access to reliable and locally relevant climate information as a significant constraint. Local governments may have access to general climate information but lack sufficiently detailed data for local vulnerability assessments and planning. In addition, the ability to use available information may be constrained by limited technical expertise and inadequate digital infrastructure.

Another recurring barrier concerns political and institutional continuity. Climate policies often require long-term commitment, while local political and administrative priorities may change relatively quickly. Changes in leadership can result in changes in policy priorities, organizational structures, or budget allocations. The literature also indicates that climate objectives may compete with immediate socioeconomic priorities, particularly in local governments facing substantial development needs.

The major barriers identified through the synthesis are presented in Table 3.

Table 3. Major Barriers to Local Climate Policy Implementation

Barrier	Capacity Area Affected	Reported Implementation Consequence
Limited financial resources	Financial capacity	Insufficient funding for climate programs
Limited technical expertise	Human and technical capacity	Weak project design and implementation
Institutional fragmentation	Institutional capacity	Poor integration of climate policies
Weak intergovernmental coordination	Collaborative capacity	Misalignment of policies and resources
Limited climate data	Information capacity	Weak climate-risk assessment
Limited political commitment	Leadership capacity	Low prioritization of climate objectives
Staff turnover	Human and institutional capacity	Loss of knowledge and implementation continuity
Weak monitoring systems	Learning capacity	Limited assessment of policy outcomes
Competing development priorities	Political and institutional capacity	Climate objectives receive lower priority

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The barriers identified in the literature demonstrate that implementation difficulties are associated with multiple capacity deficiencies. Financial constraints, technical limitations, institutional fragmentation, information gaps, and political challenges frequently occur simultaneously. The literature therefore presents local climate policy implementation as a process affected by a combination of organizational and contextual constraints rather than by a single barrier.

Capacity-Building Strategies and Research Gaps

The reviewed literature identifies several strategies for strengthening local government capacity. The first involves institutional strengthening, particularly through clearer mandates, improved organizational structures, and the integration of climate considerations into mainstream development planning. Institutional integration is frequently identified as a mechanism for ensuring that climate objectives become part of routine government activities rather than remaining isolated within environmental programs.

The second strategy involves human resource and technical development. Continuous training, professional development, knowledge-sharing systems, and partnerships with universities and research institutions are identified as mechanisms for improving local expertise. Capacity-building programs are particularly relevant to climate-risk assessment, adaptation planning, emissions management, project development, climate finance, and monitoring and evaluation.

The third strategy concerns financial strengthening. The literature identifies climate-responsive budgeting, improved financial management, project preparation, diversification of funding sources, and improved access to national and international climate finance as important approaches. Financial strategies are more likely to be effective when accompanied by improvements in technical and administrative capacity.

The fourth strategy involves strengthening multilevel and collaborative governance. Coordination among national, regional, and local governments can improve policy coherence and facilitate access to technical and financial resources. Collaboration with communities, civil society organizations, universities, private-sector actors, and development organizations can also expand the resources and knowledge available to local governments.

The fifth strategy involves strengthening information, monitoring, and learning systems. Local climate information systems, digital platforms, geographic information systems, performance indicators, and evaluation mechanisms can improve evidence-based planning and implementation. These mechanisms can also provide feedback that allows local governments to modify policies in response to changing climate conditions and implementation outcomes.

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Table 4. Capacity-Building Strategies Identified in the Literature

Capacity Challenge	Capacity-Building Strategy	Expected Improvement
Weak institutional arrangements	Clarification of mandates and climate mainstreaming	Improved policy integration
Limited technical expertise	Training and professional development	Improved implementation competencies
Limited financial resources	Climate-responsive budgeting and diversified financing	Greater financial capacity
Weak political commitment	Institutionalization of climate objectives	Greater policy continuity
Weak coordination	Multilevel and cross-sectoral governance mechanisms	Improved policy coherence
Limited climate information	Local climate information systems	Better evidence-based planning
Weak monitoring	Outcome-oriented monitoring and evaluation	Improved policy assessment
Limited institutional learning	Feedback and knowledge-sharing mechanisms	Greater adaptive capacity

Despite the growing body of literature, several research gaps remain evident. First, existing studies frequently examine individual dimensions of local government capacity rather than examining how different dimensions interact. This limits the development of a comprehensive understanding of capacity as an integrated governance capability. Second, the geographical distribution of existing research is uneven, with a substantial need for more empirical research on local governments in developing-country contexts and smaller or resource-constrained jurisdictions.

Third, much of the existing literature focuses on the presence or absence of capacity rather than examining how capacity changes over time. Longitudinal research could provide greater insight into how institutional learning, political changes, financial conditions, and capacity-building interventions influence implementation. Fourth, there remains limited empirical evidence directly connecting local government capacity with measurable climate policy outcomes, such as improved resilience, reduced vulnerability, emissions reduction, or improved community outcomes.

Finally, the literature indicates a need for more comparative research capable of explaining differences between local governments operating under similar policy frameworks. Comparative studies could identify why some local governments are able to convert limited resources into effective climate action while others experience persistent implementation gaps. Future research would benefit from multidimensional capacity

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frameworks, longitudinal designs, comparative case studies, and mixed-method approaches that connect organizational capacity with actual climate policy performance.

In summary, the results of the literature synthesis identify local government capacity as a multidimensional phenomenon encompassing institutional, human resource, technical, financial, political, collaborative, informational, and learning dimensions. The literature consistently identifies limited resources, technical deficiencies, institutional fragmentation, weak coordination, information gaps, political constraints, and weak monitoring as major barriers to implementation. At the same time, institutional strengthening, human resource development, improved financing, collaborative governance, knowledge systems, and stronger monitoring mechanisms emerge as the principal capacity-building strategies. These results provide the empirical and thematic foundation for the subsequent discussion of how the identified capacity dimensions interact and what they imply for theories and practices of local climate governance.

The Multidimensional Nature of Local Government Capacity

The findings of this literature review demonstrate that local government capacity should be understood as a multidimensional governance capability rather than as the possession of a particular administrative resource. The reviewed literature identifies institutional and administrative capacity, human resource and technical capacity, financial capacity, political leadership, coordination and collaboration, information and knowledge, and monitoring and institutional learning as interconnected components of effective climate policy implementation. This multidimensional character is particularly important because climate change is not a policy problem that can be addressed through a single administrative sector. Local governments are required to integrate climate considerations into spatial planning, infrastructure, transportation, environmental management, disaster risk reduction, public health, social services, and local economic development. Consequently, the ability to implement climate policies depends on whether local governments can coordinate these different functions and transform available resources into coherent policy actions (Armstrong, 2023; Birchall et al., 2023; Cid & Lerner, 2023).

The results also reveal an important distinction between the formal capacity to formulate policy and the practical capacity to implement policy. A local government may possess climate strategies, regulations, development plans, and formal institutional mandates, but these instruments do not necessarily guarantee implementation. Implementation requires adequate personnel, technical expertise, financial resources, organizational authority, coordination mechanisms, and monitoring systems. This distinction helps explain why the existence of similar climate policies across jurisdictions can produce substantially different implementation outcomes. The presence of a policy document demonstrates formal commitment, whereas implementation capacity reflects the government's ability to operationalize that commitment through budgets, programs, organizational routines, and measurable actions.

Institutional capacity provides the foundation for this process. Clear mandates, organizational structures, administrative procedures, and planning mechanisms allow climate objectives to become embedded within government operations. When institutional responsibilities are fragmented, climate programs may remain concentrated within environmental agencies and fail to influence other policy sectors. The results therefore suggest that climate mainstreaming is an important component of institutional

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capacity. Climate considerations need to be incorporated into routine development planning, budgeting, infrastructure decisions, and public service delivery rather than being treated exclusively as separate environmental programs. Institutionalization is particularly important for ensuring continuity because it reduces dependence on individual programs or political leaders.

Human resource and technical capacity complement institutional arrangements by determining whether government personnel possess the knowledge and skills required to operationalize climate policies. Climate policy implementation may require expertise in vulnerability assessment, climate-risk analysis, adaptation planning, emissions reduction, resilient infrastructure, environmental management, project development, and climate finance. The results indicate that shortages of specialized expertise can significantly constrain implementation even when institutional mandates and policy frameworks are already available. Consequently, capacity-building should not be limited to general awareness programs. It should include continuous professional development, specialized technical training, knowledge-sharing mechanisms, and institutional systems for retaining expertise.

Financial capacity represents another essential component of the multidimensional framework. The results indicate that local governments require sufficient resources to finance infrastructure, technology, environmental programs, disaster preparedness, community initiatives, and other climate interventions. However, financial capacity should not be understood simply as the size of a local government budget. It also involves fiscal management, budgetary prioritization, project preparation, resource mobilization, and the ability to access external financing. This broader understanding is important because local governments with relatively limited budgets may still be able to implement meaningful climate programs when they possess strong project-development capabilities and effective partnerships.

The relationship among institutional, human, technical, and financial capacity is therefore mutually reinforcing. Financial resources can support recruitment and training, while skilled personnel can improve financial management and project preparation. Strong institutions can coordinate these resources, while effective administrative systems can ensure that funding is translated into programs. Conversely, weakness in one dimension can reinforce weaknesses in others. Limited financial resources may prevent the recruitment of technical experts, while limited technical capacity can reduce the ability to obtain external climate financing. The results consequently support an integrated conception of capacity in which the effectiveness of one dimension depends partly on the strength of other dimensions.

Capacity Constraints, Governance Mechanisms, and Climate Policy Implementation

The findings indicate that the implementation gap in local climate governance is produced by the interaction of multiple capacity constraints rather than by a single institutional problem. Limited financial resources, inadequate technical expertise, fragmented institutional responsibilities, weak coordination, insufficient climate information, political uncertainty, and weak monitoring mechanisms frequently appear together. This pattern is important because it suggests that strengthening one capacity dimension in isolation may not necessarily produce substantial improvements in implementation (Nabila, 2024; Ali et al., 2025;) For example, providing additional funding without strengthening technical and administrative capacity may increase available

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resources without improving the quality of implementation. Similarly, training government officials may have limited long-term effects if institutional structures do not allow them to apply their knowledge Dell'Acqua et al. (2026).

Political leadership is particularly important in determining whether climate issues receive sufficient attention within local development agendas. Climate change often competes with immediate socioeconomic priorities such as poverty reduction, infrastructure provision, employment, health, and education. Because many climate benefits are long-term and sometimes difficult to observe immediately, political leaders may face incentives to prioritize programs that produce more visible short-term results. Strong political leadership can therefore provide the direction necessary to prioritize climate action and mobilize institutional resources. However, the findings suggest that political commitment becomes more sustainable when it is transformed into institutional commitments through regulations, development plans, budgets, organizational responsibilities, and performance indicators.

This institutionalization of political commitment is particularly important because local political leadership can change. If climate policy depends heavily on individual leaders, changes in administration may result in shifts in priorities, budgets, and institutional arrangements. By embedding climate objectives within formal planning and administrative systems, local governments can reduce this vulnerability. Climate policy then becomes part of the institutional responsibilities of government rather than simply an initiative associated with a particular administration. The findings therefore suggest that effective leadership should be understood not only as political advocacy but also as the ability to create institutional conditions for policy continuity.

Coordination and collaborative governance provide another mechanism through which local governments can address capacity limitations. Climate change requires cooperation between different levels of government and multiple sectors. National governments may establish regulatory frameworks and provide financial or technical assistance, while local governments translate these frameworks into context-specific actions. At the same time, collaboration among local government departments is necessary because climate risks affect multiple policy sectors simultaneously. Weak horizontal coordination can produce fragmented programs, duplication of responsibilities, and inconsistent policy implementation.

Collaboration beyond government can also expand local implementation capacity. Universities and research institutions can contribute scientific and technical knowledge; communities can provide local knowledge about vulnerabilities and environmental conditions; civil society organizations can support participation and social mobilization; and private-sector actors can provide technology, investment, and technical resources. These relationships can be particularly important for local governments that lack specialized expertise or sufficient financial resources internally. Nevertheless, collaboration should not be interpreted as a substitute for government capacity. Local governments still need sufficient organizational capabilities to coordinate partnerships, establish responsibilities, manage resources, and ensure accountability.

The findings further highlight the importance of information, monitoring, and institutional learning. Climate policies require reliable information about hazards, exposure, vulnerability, infrastructure, population characteristics, and socioeconomic conditions (Li et al., 2023). Yet the availability of data does not necessarily mean that local

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governments can use it effectively (Lewis et al., 2023). Local authorities need technical skills and organizational systems that allow scientific information to influence planning and decision-making Hussainzad & Gou (2024). This creates an important distinction between data availability and knowledge-use capacity.

Monitoring and evaluation provide the mechanism through which knowledge can be converted into institutional learning. Rather than focusing exclusively on whether activities have been completed or budgets have been absorbed, local governments need to assess whether interventions have reduced vulnerability, improved resilience, or contributed to mitigation objectives. Evaluation findings should then feed into subsequent planning processes. Such a feedback mechanism is particularly important because climate change involves uncertainty and changing conditions. Local governments need to be capable of modifying policies when evidence demonstrates that existing approaches are ineffective or when new risks emerge.

Taken together, these findings suggest that effective climate implementation depends on the interaction between resources, institutions, leadership, networks, and learning. A local government with limited financial resources may still achieve meaningful outcomes when it possesses strong coordination mechanisms, effective leadership, local knowledge, and external partnerships. Conversely, a government with relatively greater resources may experience implementation difficulties if institutional fragmentation, weak leadership, or inadequate technical capacity prevents effective resource utilization. Capacity should therefore be assessed not only according to what local governments possess but also according to how effectively they organize and mobilize what they possess.

Implications for Climate Governance and Future Research

The findings have important implications for the design of climate governance strategies, particularly in developing-country contexts. Local governments in these contexts frequently face multiple and simultaneous pressures, including limited fiscal resources, infrastructure deficits, socioeconomic inequality, disaster risks, and increasing climate vulnerability. Climate policy therefore cannot be treated as an isolated environmental agenda. Instead, climate objectives need to be integrated into existing development priorities and administrative processes (Kivimaa et al., 2025). Infrastructure development, spatial planning, public health, disaster management, transportation, agriculture, and public services can all incorporate climate-risk and resilience considerations. Such integration can reduce competition between climate objectives and broader development priorities while strengthening policy coherence (Dzebo et al., 2025; Nilsson et al., 2022).

The results also suggest that capacity-building programs should be context-specific and systemic. A standardized intervention that focuses only on training or financial assistance may not address the most significant constraints experienced by a particular local government. Capacity assessments should first identify the specific combination of institutional, financial, technical, political, informational, and collaborative limitations. Capacity-building interventions can then be designed according to these conditions. In one jurisdiction, improving access to climate finance may be the most important intervention, while in another, strengthening technical expertise or interdepartmental coordination may produce greater benefits.

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Another important implication concerns the relationship between external assistance and local ownership. National governments, international organizations, development agencies, universities, and other external actors can provide financial resources, technical expertise, data, and training. However, external support should strengthen rather than replace local institutional capacity. When climate programs depend excessively on external actors, implementation may become vulnerable once funding or technical assistance ends. Sustainable capacity requires local governments to progressively develop the ability to design, finance, implement, monitor, and adapt climate programs using their own institutional systems.

From a theoretical perspective, the findings contribute to a broader understanding of local government capacity by demonstrating that capacity is both multidimensional and relational. It is multidimensional because climate policy implementation requires several complementary forms of capacity. It is relational because local governments can expand their capabilities through collaboration with other governmental levels, communities, universities, civil society, private-sector actors, and development institutions. Capacity should therefore not be viewed solely as an internal characteristic of government organizations. It also emerges through institutional relationships, networks, knowledge exchange, and resource mobilization.

The review also identifies several important research gaps. First, future studies should develop multidimensional frameworks for measuring local government climate capacity rather than relying on single indicators such as budget size, number of personnel, or existence of climate plans. Second, greater attention should be given to the interaction among capacity dimensions. Understanding whether financial, technical, institutional, political, and collaborative capacities reinforce or compensate for one another would provide a more sophisticated explanation of implementation performance. Third, longitudinal research is needed to examine how local government capacity develops over time and how political changes, institutional reforms, training, financial interventions, and collaborative networks influence implementation.

Future studies should also move beyond measuring capacity itself and examine its relationship with actual climate outcomes. The ultimate purpose of strengthening local government capacity is not simply to increase administrative resources but to improve resilience, reduce vulnerability, support mitigation, and produce more sustainable and equitable outcomes. Comparative studies across local governments could therefore investigate why jurisdictions with similar policy responsibilities and resources achieve different levels of climate policy performance.

Overall, the discussion confirms that local government capacity constitutes a critical link between climate policy formulation and implementation. Effective climate governance requires more than formal commitments and policy documents. It requires institutions capable of mobilizing resources, developing human and technical expertise, coordinating multiple actors, using knowledge, maintaining political commitment, monitoring outcomes, and learning from implementation experience. The central implication is that local government capacity-building should be approached as an integrated and long-term governance process rather than as a collection of isolated interventions. Such an approach provides a stronger foundation for transforming climate policy commitments into sustained, locally appropriate, and measurable climate action.

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Conclusion

This literature review demonstrates that local government capacity is a fundamental determinant of effective climate change policy implementation and should be understood as a multidimensional and interconnected governance capability encompassing institutional and administrative structures, human and technical resources, financial capacity, political leadership, coordination and collaboration, information and knowledge, and monitoring and institutional learning. The findings indicate that the existence of climate policies and formal institutional mandates does not automatically guarantee effective implementation, as local governments continue to face interconnected constraints related to limited resources, technical expertise, institutional fragmentation, weak coordination, insufficient climate information, political uncertainty, and inadequate monitoring systems. The review further shows that effective capacity-building requires an integrated and context-sensitive approach that strengthens institutional arrangements, develops human and technical expertise, improves access to financial resources, institutionalizes political commitment, expands collaborative networks, strengthens knowledge systems, and promotes continuous learning. Ultimately, strengthening local government capacity is essential for transforming climate policy commitments into sustained, locally appropriate, and measurable adaptation and mitigation actions. Future research should therefore place greater emphasis on multidimensional capacity measurement, comparative and longitudinal analysis, and the relationship between local government capacity and actual climate outcomes, particularly in developing-country contexts where institutional and resource constraints may significantly shape climate policy implementation.

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