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Making Cities Resilient 2030 (MCR2030): A Multidimensional Framework for Urban Resilience Governance and Climate Policy Integration

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ABSTRACT

Cities are exposed to the interacting impacts of climate change, natural hazards, and growing urban pressures, highlighting the need for integrated approaches to urban resilience. The Making Cities Resilient 2030 (MCR2030) initiative, led by the United Nations Office for Disaster Risk Reduction (UNDRR), provides local governments with tools for risk assessment, planning, capacity development, and resilience implementation. This study critically examines the role of MCR2030 in connecting disaster risk reduction, climate change adaptation, and sustainable urban development. A critical review-analytical design was adopted, combining document analysis, qualitative content analysis, conceptual framework development, and comparative analysis. The study develops a Context–Structure–Output model and examines MCR2030 through a matrix-based analysis of implementation barriers, stakeholder roles, and six dimensions of urban resilience, together with a comparison of two city cases: Batu City, Indonesia, and Venâncio Aires, Brazil. The findings indicate that MCR2030 provides a useful structure for risk assessment, institutional learning, capacity development, and coordination with the Sendai Framework, Sustainable Development Goal 11, the Paris Agreement, and the New Urban Agenda. However, important gaps remain in implementation capacity, sustainable financing, data availability, cross-sectoral coordination, and the participation of private-sector and community actors. Physical-infrastructural and institutional dimensions show stronger documented coverage than socio-cultural, economic, and environmental dimensions. The cases demonstrate that similar frameworks may encounter different barriers depending on local governance, hazard characteristics, and operational resources. Overall, MCR2030 functions as a facilitating framework whose practical contribution depends on the institutional, financial, knowledge, and social conditions of the cities where it is implemented.

Keywords:

Making Cities Resilient 2030 (MCR2030), Sendai Framework, Sustainable Development Goal 11 (SDG 11), Urban Resilience Scorecard, multilevel governance, Context-Structure-Output model

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1. Introduction

The accelerating pace of urbanization, coupled with the intensifying consequences of climate change, has made urban resilience one of the most critical issues on the sustainable development policy agenda. According to United Nations estimates, more than 57% of the world's population currently lives in urban areas, a share projected to reach approximately 68% by 2050 (United Nations, 2024). Owing to their concentration of population, infrastructure, economic activity, and critical services, cities are highly vulnerable to the impacts of climate change (UN-Habitat, 2022).

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) shows that the increasing frequency and intensity of heatwaves, extreme precipitation, floods, droughts, storms, and sea-level rise, particularly in urban areas, have caused economic losses, disruptions to infrastructure services, threats to public health, and the deepening of social inequalities (IPCC, 2022). Under these conditions, the shift from reactive management toward proactive and integrated risk governance has become doubly important.

In response to these challenges, the concept of urban resilience has, over the past two decades, become a central concept in urban planning and disaster risk management. Nevertheless, despite its widespread adoption, the concept continues to suffer from considerable conceptual ambiguity and operational challenges (Sharifi, 2020). Urban resilience refers to a city's capacity to anticipate, prepare for, absorb, cope with, adapt to, and recover from hazards, in a manner that preserves essential functions while also strengthening long-term learning and transformative capacity (Meerow et al., 2016; OECD, 2023).

In 2010, the United Nations Office for Disaster Risk Reduction launched the "Making Cities Resilient" campaign under the slogan "My City is Getting Ready" (UNDRR, 2010). This initiative was redesigned in 2020 under the name Making Cities Resilient 2030 and evolved into a global multi-stakeholder partnership to support local governments (MCR2030, 2021). The MCR2030 program provides local governments with tools such as the Disaster Resilience Scorecard for Cities, the Resilience Roadmap, learning networks, and technical support.

The concept of resilience was first introduced by Holling in the field of ecology, referring to a system's capacity to absorb disturbance while maintaining its essential functions (Holling, 1973). In contemporary literature, urban resilience extends beyond a mere return to a prior state to encompass anticipation, adaptation, and transformation (Meerow et al., 2016). However, Sharifi (2020) emphasizes that many existing definitions focus excessively on physical infrastructure while paying insufficient attention to institutional dimensions, governance, social justice, and learning capacity. From the OECD's (2023) perspective, urban resilience emerges from the interaction of governance, investment, social participation, sustainable infrastructure, knowledge management, and evidence-based decision-making. Guidance for local governments similarly emphasizes the importance of local leadership and institutional capacity in translating resilience principles into practical action (Gencer, 2017), consistent with recent research emphasizing the role of governance in shaping urban resilience (Abdillah et al., 2025). This paper regards resilience as a fundamentally political and social concept, one whose meaning is constituted within processes of resource and power allocation.

Climate change has dramatically increased urban risks. According to the IPCC (2022), climate hazards frequently manifest as compound and multi-hazard risks, requiring cross-sectoral cooperation and integrated approaches to manage effectively. Recent research also emphasizes the value of integrative approaches that connect urban resilience strategies with climate change vulnerability reduction (Lv & Sarker, 2024). The concept of Climate Resilient Development Pathways emphasizes coordination among sustainable development, disaster risk reduction, climate change adaptation, greenhouse gas emission reduction, and social justice. The World Cities Report 2022 (UN-Habitat, 2022) shows that a significant gap exists between global policies and their practical implementation at the local level—a gap that is particularly important in developing countries. Evidence from a systematic review of governance for urban resilience in developing-country contexts further indicates that the existence of governance structures does

not necessarily ensure inclusive participation in formal decision-making processes (Rivero-Villar & Vieyra Medrano, 2022).

Over the past two decades, the international community has developed several frameworks and agreements aimed at reducing urban vulnerability. The Sendai Framework (UNDRR, 2015; Aitsi-Selmi et al., 2015) emphasizes four core priorities: understanding disaster risk, strengthening risk governance, investing in disaster risk reduction, and enhancing preparedness for effective response and "Build Back Better" recovery. Sustainable Development Goal 11 (United Nations, 2015) focuses on reducing disaster-related losses, developing resilient infrastructure, and strengthening urban planning capacity. The Paris Agreement (UNFCCC, 2015) identifies climate change adaptation as one of the central pillars of climate action, while the New Urban Agenda (UN-Habitat, 2016) emphasizes integrating resilience, risk management, and climate adaptation into urban development policy.

The Making Cities Resilient 2030 program was launched in 2020 by UNDRR as a continuation of the earlier global Making Cities Resilient campaign. The program aims to support local governments in risk assessment, planning, capacity-building, investment, and inter-city experience exchange (MCR2030, 2021). Unlike some international frameworks that are primarily policy-oriented, MCR2030 provides cities with a set of operational tools, including the Disaster Resilience Scorecard and related action-planning guidance (UNDRR et al., 2023). Nevertheless, the effectiveness of these tools depends on the quality of local governance, technical capacity, access to reliable data, stakeholder participation, and sustainable financial resources (UNDRR et al., 2024).

The program operates through a multilevel and participatory structure comprising four main tiers: (1) global coordination by UNDRR; (2) regional platforms that facilitate learning and knowledge exchange; (3) national focal points that connect national policy with local action; and (4) local governments and city networks as key actors in implementation. While this structure is formally designed to operate across multiple levels and emphasizes participation, a critical examination suggests that decision-making and program direction remain substantially shaped at higher institutional levels, particularly through global and national coordination mechanisms. This may limit the extent to which local actors can influence program priorities, content, and implementation approaches, despite their central role in local resilience implementation.

The MCR2030 program offers four main categories of tools:

- Disaster Resilience Scorecard for Cities: a self-assessment tool based on the Ten Essentials for Making Cities Resilient, which helps identify gaps (UNDRR, 2020).
- Resilience Roadmap: a phased action plan following the assessment, emphasizing participatory planning, prioritization of actions, and continuous progress monitoring (MCR2030, 2021).
- Learning and experience-exchange networks: platforms for knowledge transfer, experience sharing, and peer-to-peer learning among cities.
- Capacity-building and technical support: the provision of training, expert consultation, risk assessment, database development, and empowerment of city managers.

A key critique of these tools is that, despite their practical utility, they adopt a fundamentally "technocratic" approach and, by emphasizing quantitative indicators and checklists, may overlook the qualitative and political dimensions of resilience, such as public trust, social cohesion, and justice. The key components and features of the program are summarized in Table 1.

Despite the growing body of research, a substantial portion of existing studies has focused on theoretical dimensions, indicator design, or single-city case studies, while critical analyses examining the actual role of such programs in improving urban governance and climate policy remain limited. The present study aims to address this gap by investigating the extent to which the MCR2030 program can function as an effective framework for integrating resilience into climate change and sustainable development policies, and by identifying the most significant institutional, financial, and governance barriers to achieving this goal. The originality of the present study lies in offering an integrated critical-structural analysis accompanied by new conceptual models, including the Context–Structure–Output model, a matrix-based barrier analysis, an assessment of resilience-dimension coverage, and a comparative analysis of stakeholder roles, all designed

to clarify the program's position at the intersection of disaster risk reduction, climate change adaptation, and sustainable development.

Table 1. Key Components and Features of the MCR2030 Program

Component	Description
Program Objective	Advancing urban resilience through disaster risk reduction, strengthened climate change adaptation, and support for sustainable development
Lead Institution	United Nations Office for Disaster Risk Reduction (UNDRR), in collaboration with a network of international partners
Aligned Frameworks	Sendai Framework, Sustainable Development Goal 11, Paris Agreement, and the New Urban Agenda
Core Tools	Urban Resilience Scorecard, Resilience Roadmap, peer learning networks, and technical support
Stakeholders	Local and national governments, universities, international organizations, civil society, and the private sector
Expected Outputs	Strengthened urban governance, increased resilience, reduced disaster risk, and support for sustainable development

2. Data and Methodology

This study adopts a critical review-analytical design combining document analysis, qualitative content analysis, conceptual framework development, and comparative analysis. The methodology was designed to examine how MCR2030 integrates urban resilience, climate policy, governance, and multi-level implementation, while identifying areas of strength and gaps across key dimensions of urban resilience.

The analysis was based on a purposively selected body of peer-reviewed scholarly literature and official or technical documents relevant to MCR2030, urban resilience, disaster risk reduction, climate adaptation, and sustainable urban development. Documents were selected according to their relevance to the research objectives, institutional or academic credibility, and their contribution to understanding the conceptual and operational dimensions of urban resilience. The analysis did not follow a systematic-review protocol with a predefined database search, screening flow, or fixed publication-year range. Instead, it focused on key scholarly studies, official reports, technical guidance documents, and major international policy frameworks that provided substantive evidence for the analytical themes of the study. Foundational international frameworks were retained regardless of publication year when they provided authoritative conceptual or policy foundations for the analysis. Document analysis was used as a qualitative research approach to systematically examine the selected documentary sources and identify relevant concepts, themes, and relationships (Bowen, 2009).

A qualitative content-analysis approach was used to identify recurring concepts, relationships, implementation mechanisms, and institutional challenges. The documents were examined through initial thematic coding and subsequently grouped into broader conceptual clusters. The main analytical categories included: (1) governance and institutional structures; (2) operational tools and implementation mechanisms; (3) institutional, financial, and knowledge-related barriers; (4) stakeholder participation and social dimensions; and (5) linkages with international frameworks for disaster risk reduction, climate action, and sustainable urban development. These themes were then comparatively mapped to identify areas of convergence, complementarity, and remaining gaps within the MCR2030 framework. Rather than defining a fixed corpus size in advance, the analysis prioritized sources that provided substantive evidence for the identified analytical themes. Accordingly, the selected sources were treated as an analytical evidence base rather than as a statistically representative document sample. The conceptual framework was developed inductively from the themes identified through the document analysis. The resulting Context–Structure–Output model distinguishes between the contextual conditions that enable or constrain urban resilience, the

MCR2030 structures and implementation mechanisms through which resilience is pursued, and the resulting outputs and intended outcomes. This framework was subsequently used to organize the analysis of governance arrangements, stakeholder roles, implementation mechanisms, and resilience dimensions.

The development of the conceptual model followed three analytical steps. First, recurring themes and relationships were identified through the qualitative analysis of the selected documentary sources. Second, these themes were conceptually clustered into contextual conditions, program structures and implementation mechanisms, and intended outputs and outcomes. Third, the resulting relationships were synthesized into the Context–Structure–Output model, which was subsequently used as an analytical framework for interpreting governance arrangements, stakeholder roles, implementation mechanisms, and resilience dimensions within MCR2030. To assess the extent to which MCR2030 addresses different aspects of urban resilience, six analytical dimensions were considered: physical-infrastructural, institutional, knowledge-educational, economic, environmental, and socio-cultural resilience. Recent approaches to urban resilience assessment similarly emphasize the multidimensional and context-dependent nature of resilience and the need for structured assessment approaches (Datola, 2023; Labaka et al., 2026). A structured ordinal scale from 0 to 5 was used to assess the documented coverage of each dimension within the framework. A score of 0 indicates no identifiable coverage, 1 very limited coverage, 2 limited coverage, 3 moderate coverage, 4 good coverage, and 5 very good coverage.

The scores represent a structured assessment of the extent and explicitness of documented coverage within MCR2030 and should not be interpreted as empirical measurements of actual city-level resilience or program effectiveness. The assessment considered the explicit treatment of each dimension, its presence across relevant program components, and the extent to which it was connected to identifiable implementation mechanisms. This approach was used to make the analytical comparison transparent while recognizing that the assessment is based on documentary evidence rather than field-based measurement.

The comparative analysis was conducted at two levels. First, MCR2030 was examined in relation to major international frameworks, including the Sendai Framework for Disaster Risk Reduction, Sustainable Development Goal 11, the Paris Agreement, and the New Urban Agenda. This comparison focused on areas of conceptual alignment, complementarity, and potential gaps. Second, the two selected city cases—Batu City, Indonesia, and Venâncio Aires, Brazil—were examined comparatively in terms of their implementation context, institutional coordination, preparedness and planning, operational capacity, and documented implementation experience.

3. Results

3.1. Strengths and Capacities of the MCR2030 Program

Document analysis shows that MCR2030 offers a multi-sectoral framework for advancing urban resilience. Its principal strengths include:

- Proactive risk management: an emphasis on risk understanding, planning, and vulnerability reduction prior to crisis occurrence, in contrast to purely reactive approaches.
- Operational tools: the Scorecard and Roadmap enable a structured assessment of resilience status, identification of gaps, and prioritization of intervention areas.
- Networking and learning: peer networks and experience exchange can contribute to knowledge transfer, institutional capacity development, and strengthened regional cooperation.
- Alignment with global frameworks: the program provides an effective bridge between macro-level policies (Sendai, SDG 11, Paris, and the New Urban Agenda) and local action.
- Capacity-building and technical support: the provision of training and expert consultation can help empower city managers.

3.2. Implementation Challenges and Fundamental Critiques

The successful implementation of MCR2030 faces multiple challenges:

- Disparities in institutional capacity: many low- and middle-income cities lack the human resources, management structures, and technical capacity to make full use of the program's tools (World Bank, 2023; Wieszczeczynska et al., 2024).
- Data and standardization problems: the absence of unified standards for collecting, managing, and exchanging hazard-related data makes it difficult to accurately assess resilience and compare city performance (UNDRR, 2020; OECD, 2023).
- Financial challenges and participation inequality: the program's dependence on sustainable financial resources and the unequal participation of cities (both geographically and institutionally) constitute one of its principal obstacles.
- The "black box" critique: excessive reliance on assessment tools (the Scorecard) may reduce the program to a technical-administrative process, neglecting the political dimensions of power and social justice inherent in the resilience process. As critical studies have shown, resilience is always a value-laden and political concept, and the selection of indicators, priorities, and stakeholders reflects local power relations (Kolte et al., 2023).
- Monitoring and evaluation systems: the absence of standardized indicators for long-term monitoring and impact evaluation limits the ability to judge the program's true success.

3.3. A Comprehensive Conceptual Model: The Context–Structure–Output Interaction

Based on the study's findings, the following conceptual model is proposed to explain the relationship between the structure of the MCR2030 program and the institutional-governance context (Figure 1).

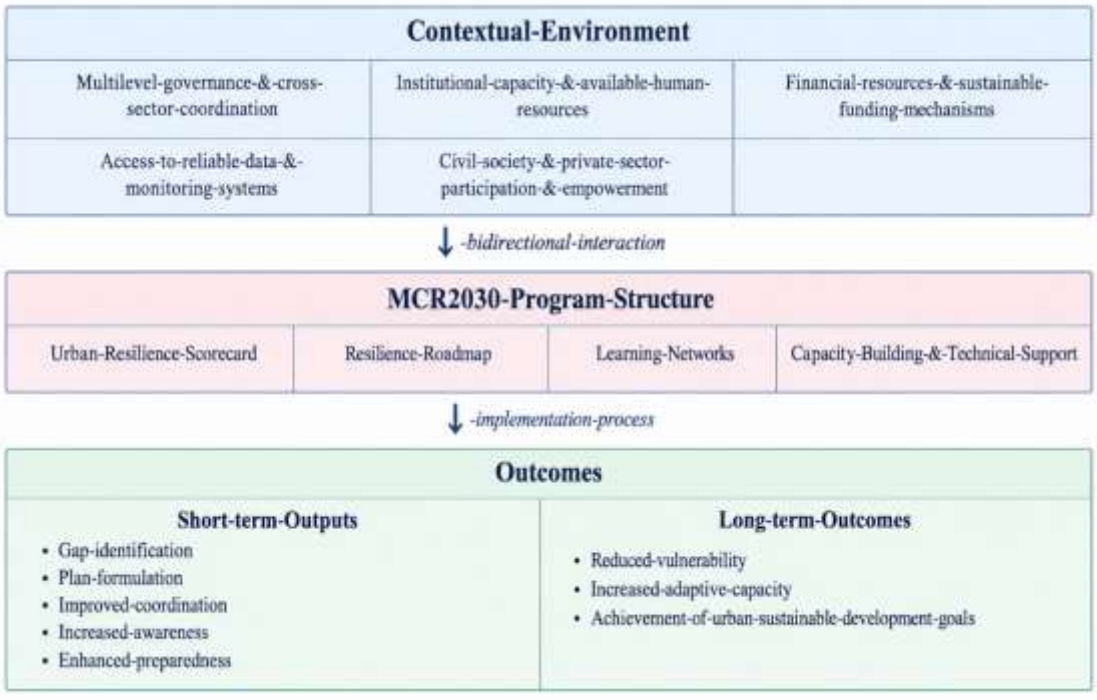


Figure 1. Comprehensive conceptual model of the Context-Structure-Output interaction in MCR2030's success

This model shows that (i) the contextual environment (institutional, financial, data-related, and participatory factors) plays a decisive role in the program's success; (ii) the program structure (tools and networks) functions as a catalyst and cannot substitute for weaknesses in the contextual environment; (iii) short-term outputs (gap identification, planning) constitute a precursor to long-term outcomes (vulnerability reduction, adaptation); and (iv) through a feedback loop, long-term outcomes can, in turn, influence the contextual environment, enhancing institutional capacity and governance over time.

3.4. A Matrix-Based Analytical Model of Barriers and Solutions for MCR2030 Implementation

To systematically analyze barriers, a 2×2 matrix model was designed, classifying obstacles along two dimensions (institutional-structural and knowledge-resource) and two levels (local and supralocal) (Table 2).

Table 2. Matrix of barriers and implementation solutions for MCR2030

Level	Barrier Category	Identified Barriers	Proposed Solution
Local	Institutional-Structural	Weak cross-sectoral coordination; absence of effective participatory structures; weak legal-regulatory system; lack of transparency and accountability	Strengthening local governance, creating binding participatory structures, reforming the local legal system
Local	Knowledge-Resource	Shortage of specialized personnel; lack of reliable local data; limited financial resources; absence of a local monitoring system	Continuous training, developing a data-driven system, mobilizing sustainable financial resources, establishing a monitoring system
Supralocal (National/Global)	Institutional-Structural	Misalignment of national policies; weak regional coordination structures; Limited flexibility in the program approach; absence of coordinating institutions	Integrating national policies, strengthening regional platforms, reforming the program's approach
Supralocal (National/Global)	Knowledge-Resource	Lack of unified data standards; North-South knowledge gap; inequality in access to global resources; mismatch between tools and local contexts	Developing shared assessment systems, facilitating knowledge and technology transfer, localizing tools

3.5. Assessing MCR2030's Coverage of the Six Dimensions of Urban Resilience

To assess the extent to which the program covers various dimensions of resilience, the assessment in Table 3 was designed.

The scores presented in Table 3 represent a structured qualitative assessment of the documented coverage of each resilience dimension within MCR2030. The assessment was based on three considerations: the explicitness with which a dimension is addressed, its presence across relevant components of the framework, and the extent to which it is connected to identifiable implementation mechanisms. The 0–5 scale therefore indicates the relative degree of documented framework coverage, rather than measured resilience performance or causal effectiveness. Higher scores indicate more explicit, broader, and more operationalized treatment of a dimension, whereas lower scores indicate more limited or indirect coverage. The scores were assigned by the authors based on the predefined assessment criteria and the documentary evidence identified in the reviewed materials.

Table 3. Assessment of MCR2030's coverage of the six dimensions of urban resilience

Resilience Dimension	Examples of Coverage in MCR2030	Coverage Score (0–5)	Analytical Basis
Physical-Infrastructural	Critical infrastructure, buildings, housing, and physical risk reduction	5	Explicit and comprehensive attention to physical risk reduction and infrastructure-related resilience through the MCR2030 tools and assessment approach.
Institutional	Governance, institutional coordination, laws and regulations, and multi-level cooperation	4	Strong emphasis on governance and institutional capacity, although the effectiveness and consistency of institutional coordination depend on local implementation conditions.
Knowledge-Educational	Awareness, education, technical knowledge,	4	Clearly incorporated through knowledge exchange, learning, technical support, and capacity-building

Resilience Dimension	Examples of Coverage in MCR2030	Coverage Score (0–5)	Analytical Basis
	learning, and capacity development		activities, although access and implementation may vary across cities.
Economic	Investment, financing, and economic employment, resilience	4	Economic resilience is recognized within the framework, but financial mechanisms, investment capacity, and long-term economic implementation are less explicitly developed than physical and institutional dimensions.
Environmental	Climate adaptation, environmental sustainability, ecosystems, and natural resources	3	Environmental and climate considerations are incorporated, but ecosystem-based and natural-resource dimensions receive less explicit and systematic treatment than infrastructure and governance.
Socio-Cultural	Social participation, equity, community engagement, cohesion, and social capital	2	Social and participatory aspects are acknowledged, but their operationalization and systematic integration into implementation mechanisms remain comparatively limited

3.6. Comparative Analysis of Stakeholder Roles in the MCR2030 Program

One of the program's central challenges is the unequal participation of stakeholders. Table 4 compares the theoretical and actual roles of each stakeholder group.

Table 4. Comparative analysis of stakeholder roles in the MCR2030 program

Stakeholder	Theoretical Role	Actual Role (Evidence-Based)	Key Gap	Proposed Solution
Local Governments	Principal process manager, final decision-maker, implementation coordinator	Often act as directive-executors and tool-recipients	Lack of genuine authority and sufficient resources for independent decision-making	Strengthening decentralization and delegation of authority
National Governments	Facilitator, provider of policy framework and financial resources	Often play a supervisory and sometimes restrictive role; poor coordination with local level	Misalignment of national policy with local needs	Establishing national-local coordination councils
Private Sector	Provider of capital, technology, and innovation	Mainly acts as project contractor; limited participation in decision-making	Lack of transparency regarding return on resilience investment	Designing innovative financial instruments and incentives
Civil Society & Residents	Source of local knowledge, facilitator of social justice, participant in planning	Often a passive recipient of services or participant; weak advisory role	Local knowledge and community capacities are overlooked	Designing genuine participatory processes and empowerment
Academic & Research Centers	Provider of knowledge, data, scientific analysis, independent evaluator	Ad hoc and limited engagement; lack of sustained cooperation	Gap between research and practice	Building sustained science-practice networks
International Institutions (UNDRR & partners)	Global coordinator, tool developer, provider of technical support	Strong central coordination and limited flexibility for localization	Mismatch between tools and local contexts	Increasing flexibility and localizing tools

3.7. Case Studies

Batu City, Indonesia. Batu City represents a case in which the MCR2030 framework has been integrated into local disaster-risk governance and resilience planning (Sholeha et al., 2022). The city assessment reported an overall score of 79.04%, corresponding to Stage C (Progressive Implementation), indicating a relatively advanced level of progress in the implementation process. The assessment highlights the role of local institutional arrangements and risk-informed planning in advancing urban resilience.

At the same time, the case indicates an institutional coordination gap between the Regional Disaster Management Agency (BPBD) and organizations associated with tourism and economic activities. While BPBD demonstrated stronger capacities in risk understanding and planning, the involvement and coordination of economic and tourism-related actors were comparatively less developed. This finding is important because Batu City's resilience is closely connected not only to disaster-risk management but also to the continuity of economic and tourism activities. The case therefore illustrates that progress in formal disaster-risk governance does not necessarily ensure balanced integration across all urban sectors.

Venâncio Aires, Brazil. Venâncio Aires provides a contrasting implementation context in which MCR2030 principles were incorporated into a local risk-management program addressing major hazards, particularly floods and landslides (Santos et al., 2025). The case demonstrates the importance of connecting resilience planning with operational preparedness and local response capacity. The occurrence of severe flooding in May 2024 exposed practical challenges related to disruption of urban activities, equipment availability, and operational capacity.

The experience of Venâncio Aires therefore highlights a key implementation dimension that complements the Batu City case. While institutional planning and risk-management structures are important, their effectiveness also depends on the availability of operational resources and the capacity of local institutions to respond under actual hazard conditions. The case illustrates the potential gap between the existence of a resilience-oriented framework and the capacity to implement and sustain resilience measures during severe events.

Comparative analysis of the two cases. The two cases demonstrate different but complementary dimensions of MCR2030 implementation. Batu City illustrates the importance of institutional coordination and the integration of disaster-risk governance with economic and sectoral actors. Its documented assessment indicates progress in risk understanding and planning, while also identifying coordination gaps among relevant institutions. Venâncio Aires, in contrast, emphasizes the operational dimension of resilience, particularly the importance of preparedness, equipment, and response capacity when exposed to severe flooding and other hazards.

Taken together, the cases suggest that urban resilience under MCR2030 depends on more than the establishment of planning and governance structures. Effective implementation requires coordination across sectors, adequate operational resources, and the ability to translate planning and institutional arrangements into practical action. The comparison also demonstrates that the challenges of implementation may differ according to local institutional and hazard contexts. Rather than representing identical models of MCR2030 implementation, the two cases provide complementary evidence of the institutional and operational conditions that influence the translation of resilience principles into local practice.

3.8. Critical Analysis of the Role of the Private Sector and Local Communities

Although the MCR2030 framework recognizes the roles of the private sector and civil society, their practical engagement appears to be less developed than their potential contribution to urban resilience. The private sector is frequently associated with financing and project implementation, while its potential contributions to risk identification, technical innovation, and the development of resilience solutions could be further strengthened. One important challenge is the limited shift from viewing resilience primarily in terms of costs toward recognizing resilience as an investment opportunity, together with the limited availability of transparent mechanisms for assessing the returns on resilience investment.

Similarly, civil society and local communities are not always positioned as active contributors to resilience planning, despite their potential to provide local knowledge, strengthen participation, and support social equity (Parsons et al., 2025). Strengthening their role would require more systematic participatory mechanisms, clearer institutional responsibilities, and appropriate incentives for meaningful engagement. These observations are particularly relevant to the socio-cultural and economic dimensions of urban resilience identified in Table 3.

The results of the analysis are synthesized in Table 5, which presents a comprehensive analytical assessment of the MCR2030 framework, and in Table 6, which summarizes the alignment of MCR2030 with major international frameworks.

Table 5. Comprehensive analytical assessment of the MCR2030 framework

Component	Strengths	Challenges	Evidence	Proposed Solutions
Governance	Multilevel coordination and cross-sectoral participation	Disparities in institutional capacity and weak local coordination	Batu City study and the gap between BPBD and other organizations	Strengthening cross-sectoral coordination; creating binding participatory structures
Data	Standardized assessment and monitoring tools	Lack of common standards and data shortages	Challenges reported in urban resilience studies (UNDRR, 2020)	Establishing data-driven systems and common standards
Financing	Access to certain international support networks	Limited sustainable financial resources	Reports on cities in developing countries (World Bank, 2023)	Designing innovative financial instruments and private-sector participation
Experience	Learning and experience-exchange networks	Unequal participation of cities and stakeholders	MCR2030 Global Secretariat, *Pathways to Resilience* (2026)	Facilitating equal access to learning networks
Institutional Capacity	Capacity-building and training	Shortage of specialized personnel and implementation capacity	Venâncio Aires case study (Santos et al., 2025)	Investing in training and specialized skill development
Social Justice	Reference to stakeholder participation	Neglect of justice dimensions and local community empowerment	Critiques of the program's technocratic approach (Kolte et al., 2023)	Designing genuine participatory processes and community empowerment

Table 6. Alignment of MCR2030 with international frameworks

Global Framework	Main Objective	MCR2030's Role	Alignment Gaps	Proposed Solutions
Sendai Framework 2015-2030	Disaster risk reduction	Supporting the implementation of risk-reduction principles at the city level (UNDRR, 2015)	Lesser emphasis on Build Back Better and the role of local communities	Strengthening reconstruction dimensions and community participation in the program
Sustainable Development Goal 11	Inclusive, safe, resilient, and sustainable cities	Supporting urban resilience planning and assessment (United Nations, 2015)	Incomplete coverage of inclusion and social-justice dimensions	Developing indicators related to justice and inclusion
Paris Agreement	Climate change adaptation	Strengthening adaptive capacity and reducing urban vulnerability (UNFCCC, 2015)	Limited connection to emission reduction and carbon markets	Linking the program to emission-reduction strategies

New Urban Agenda	Sustainable urban development	Strengthening urban governance and planning (UN-Habitat, 2016)	Neglect of physical-spatial and urban design dimensions	Integrating resilient urban design approaches

4. Discussion

The findings suggest that MCR2030 occupies an important position at the intersection of disaster risk reduction, climate change adaptation, and sustainable urban development. Its main contribution is not simply the provision of assessment tools, but the creation of a common structure through which cities can identify risks, organize resilience priorities, strengthen learning, and connect local action with broader international frameworks. However, the analysis also indicates that the existence of a common framework does not necessarily translate into comparable implementation capacity or resilience outcomes across cities.

A central theoretical implication of the study is that the effectiveness of MCR2030 should be understood as a function of the interaction between program structure and the institutional context in which it is implemented. The Context–Structure–Output model developed in this study therefore extends a predominantly tool-oriented interpretation of urban resilience by emphasizing the enabling conditions surrounding the program. Governance capacity, financial resources, data availability, institutional coordination, and stakeholder participation are not external factors that can be considered separately from implementation; rather, they shape the extent to which MCR2030 tools can generate meaningful outputs. This interpretation is consistent with the broader urban resilience literature, which emphasizes that resilience depends not only on technical preparedness but also on institutional capacity, learning, governance, and the ability of urban systems to adapt and transform (Meerow et al., 2016; Sharifi, 2020; Elmqvist et al., 2019).

The findings also highlight a tension between the need to make resilience measurable and the multidimensional nature of resilience itself. Recent evidence from a systematic review of urban resilience indicators shows that existing assessment frameworks often emphasize technical infrastructure while giving comparatively less attention to governance processes and equity considerations, highlighting the need for multidimensional and context-sensitive approaches to resilience assessment (Nghiem et al., 2026). Assessment tools such as the Scorecard are valuable because they provide a structured basis for identifying gaps and prioritizing actions. At the same time, the analysis indicates that dimensions that are more difficult to quantify—particularly social participation, equity, community empowerment, and some aspects of economic and environmental resilience—may receive less explicit operational attention. This does not imply that MCR2030 ignores these dimensions; rather, it suggests that the operationalization of resilience through assessment tools can favor dimensions that are more readily represented through standardized indicators. The result is an important distinction between measuring the presence of resilience-related capacities and capturing the broader social and political processes through which resilience is produced.

This issue is particularly relevant to the relationship between MCR2030 and international frameworks. The analysis shows substantial conceptual alignment with the Sendai Framework, SDG 11, the Paris Agreement, and the New Urban Agenda. However, alignment at the level of objectives does not necessarily mean full operational integration. The identified gaps concerning community participation and "Build Back Better," emission reduction, social justice, and physical-spatial planning indicate that MCR2030 functions more effectively as a framework for connecting and operationalizing selected resilience priorities than as a comprehensive substitute for these broader policy frameworks. In this sense, its added value lies in facilitating implementation at the city level, while its limitations emerge when broader political, social, spatial, and climate-policy objectives need to be translated into operational mechanisms.

The stakeholder analysis further strengthens this interpretation. The difference between the roles formally assigned to local governments, private-sector actors, civil society, research institutions, and international organizations and their documented practical roles suggests that participation alone is not sufficient. Meaningful multilevel governance requires decision-making authority, resources, institutional continuity, and mechanisms through which local knowledge can influence priorities. This finding is consistent with critical perspectives on resilience that emphasize the importance of power relations, participation, and

justice in determining whose knowledge and priorities become embedded in resilience planning (Kolte et al., 2023). Consequently, the challenge for MCR2030 is not simply to expand the number of participating stakeholders, but to strengthen the institutional conditions under which participation can influence planning and implementation.

The two case studies provide complementary illustrations of this contextual dependence. The Batu City case highlights the importance of cross-sectoral coordination, particularly where disaster-risk institutions have stronger capacities than organizations in sectors such as tourism and economic development. The Venâncio Aires case, by contrast, demonstrates how a severe flood event can expose operational constraints, including communication disruptions, equipment shortages, and limited response capacity. Taken together, these cases suggest that similar resilience frameworks may encounter different implementation barriers depending on institutional arrangements, hazard characteristics, and available resources. They therefore support the central proposition of the Context–Structure–Output model: the same program structure may produce different practical results when the surrounding institutional and operational context differs.

These findings also have implications for the interpretation of the six-dimension resilience assessment. The relatively stronger documented coverage of physical-infrastructural and institutional dimensions compared with socio-cultural, economic, and environmental dimensions should not be interpreted as evidence that cities are inherently more resilient in the former areas. Rather, it indicates that these dimensions are more explicitly represented and operationalized within the framework. This distinction is important because the assessment is a measure of documented framework coverage, not an empirical measure of city-level resilience. The result nevertheless points to an area in which the program could further develop its analytical and implementation tools, particularly by making social equity, community participation, economic resilience, and environmental considerations more systematically operational.

Overall, the discussion indicates that MCR2030 is better understood as a facilitating and coordinating framework than as a stand-alone mechanism capable of producing resilience independently of local conditions. Its effectiveness depends on the interaction between standardized tools and locally specific governance, institutional, financial, knowledge, and participation conditions. This interpretation helps reconcile two apparently different perspectives in the literature: the value of standardized assessment and coordination mechanisms, and the critique that resilience is context-dependent, politically shaped, and difficult to capture through technical indicators alone. The contribution of MCR2030 therefore lies not in replacing local governance or broader international frameworks, but in providing a structure through which these elements can be connected and translated into city-level action.

Based on the study's findings and the critical analysis conducted using the proposed models, the following policy recommendations are offered for the effective implementation of MCR2030:

- Reforming local governance and participatory structures: strengthening the capacity of local governments through decentralization, transparency, and accountability, and establishing binding mechanisms for private-sector and civil-society participation at every stage of the program (from risk identification through monitoring and evaluation). This can help address the gaps identified in Table 4 concerning stakeholder participation, coordination, and the difference between formally assigned and practically documented roles.
- Shifting the narrative from cost to investment: developing innovative financial instruments (resilience funds, green bonds, public-private partnerships) while clarifying the economic and social returns of investing in resilience. This is particularly critical for attracting private-sector participation and addressing the financing challenges identified in Table 5.
- Integrating policy at the national level: aligning national climate change, disaster risk reduction, and urban development strategies with MCR2030's objectives, and establishing cross-sectoral coordinating institutions. This can help reduce the alignment gaps identified in Table 6.
- Strengthening data infrastructure and monitoring systems: establishing standardized systems for collecting, managing, and sharing hazard data, alongside the design of composite (quantitative and qualitative) indicators for continuous progress assessment. This can help address the data challenges and monitoring gaps identified in Table 5.

- Empowering local communities as primary actors: investing in training, specialized skill development, and improved risk literacy among citizens and local institutions, and shifting the perspective from "symbolic participation" toward "genuine empowerment" in decisions concerning resilience priorities. This can help strengthen the socio-cultural dimension identified in Table 3, while also addressing the stakeholder participation gaps discussed in Table 4.
- Localizing tools and approaches: in light of the identified mismatch between the program's tools and local contexts, the program should allow for greater flexibility and localization of its tools to suit varying economic, social, institutional, and cultural conditions. This recommendation responds particularly to the implementation challenges and proposed solutions identified in Table 5.
- Establishing a participatory monitoring and evaluation system: designing measurable indicators and continuous monitoring systems, with the participation of all stakeholders, to track the achievement of the program's objectives and to document both successful and unsuccessful experiences.

The implementation of the proposed policy recommendations may face additional constraints in low-income countries, where limited financial resources, shortages of specialized human resources, weak data infrastructure, and institutional capacity constraints can restrict the ability of local governments to adopt and sustain resilience initiatives. In such contexts, recommendations such as establishing advanced monitoring systems, developing innovative financing mechanisms, or expanding participatory structures may require gradual implementation and external technical or financial support. Therefore, the application of MCR2030 should remain flexible and context-sensitive, with priorities adapted to local institutional and resource conditions. Capacity building, access to reliable data, targeted technical assistance, and sustainable financing can provide important enabling conditions for translating resilience recommendations into feasible local actions.

A methodological limitation of this study concerns the geographical and developmental scope of the selected city cases. Both Batu City, Indonesia, and Venâncio Aires, Brazil, represent developing-country contexts. Although these cases provide useful insights into the institutional, operational, and resource-related challenges of implementing urban resilience approaches in such settings, the absence of a case from a developed-country context limits the extent to which the findings can be generalized across different income levels and institutional environments. Future comparative research should therefore include cases from developed and developing countries to examine whether the identified implementation dynamics and governance challenges are consistent across different urban contexts.

5. Conclusion

The Making Cities Resilient 2030 program is an important international initiative for supporting urban resilience against natural hazards and the impacts of climate change. Through its assessment tools, learning networks, and technical support, the program provides a foundation for improving urban planning and risk management. However, this study, adopting a critical approach and drawing on integrated conceptual models, has shown that MCR2030's real-world effectiveness depends heavily on the quality of the institutional and governance context in each city, and that reliance on technical and assessment tools alone is not sufficient.

The Context–Structure–Output model showed that the program's outcomes result from the complex interaction between contextual conditions, program structure, and implementation processes. The matrix-based barrier analysis identified challenges across four categories—local-institutional, local-knowledge, supralocal-institutional, and supralocal-knowledge—each requiring context-specific responses. The resilience-dimension coverage assessment showed stronger documented coverage of physical-infrastructural dimensions, while comparatively weaker coverage was observed for socio-cultural, economic, and environmental dimensions. Likewise, the comparative analysis of stakeholder roles revealed a significant gap between the theoretical roles assigned to different stakeholder groups and their documented roles in implementation.

A key implication is that the MCR2030 program should not be regarded as a "ready-made solution" that automatically produces resilience upon implementation. Rather, it can be viewed as a facilitating framework that, when accompanied by strengthened local governance, sustainable financing, meaningful participation by the private sector and civil society, and greater attention to socio-political and local contextual priorities, can contribute to the integration of climate policy, disaster risk reduction, and sustainable development.
The originality of this research lies in providing an integrated and critical analysis of MCR2030 through the Context–Structure–Output model, the barrier matrix, the resilience-dimension coverage assessment, and the comparative analysis of stakeholder roles. Together, these analytical components clarify the program's position at the intersection of disaster risk reduction, climate change adaptation, and sustainable development. Nevertheless, since the present study is based primarily on document analysis, future research should incorporate field data, quantitative performance evaluation of member cities, deeper comparative analysis of diverse implementation contexts, and mixed-methods approaches to provide further empirical evidence regarding the program's real-world effectiveness. Further research on how the MCR2030 program can be effectively localized in developing countries, and on its potential contribution to climate justice, could constitute an important direction for future research.

Authors' Contribution
H.D. contributed substantially to the conceptualization of the study, literature review, methodology, document analysis, interpretation of findings, and preparation and revision of the manuscript. M.H.N. contributed to the conceptualization and development of the study framework, interpretation of the findings, and critical revision of the manuscript. Both authors contributed to the discussion of the results, reviewed and approved the final version of the manuscript, and agreed to be accountable for all aspects of the work.

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Data Availability Statement
This study is based on publicly available scholarly literature, official reports, and policy and technical documents. No new datasets were generated or analyzed during the study.

Declaration of AI Use
During the preparation of this manuscript, generative artificial intelligence (AI) tools were used as research assistance to support the organization and refinement of the manuscript, including language editing, improving clarity and presentation, and assisting with the drafting and revision of selected sections. AI tools were also used to support the summarization and organization of relevant scholarly materials. All AI-assisted content was critically reviewed and independently verified by the authors. The authors did not use AI tools to generate research data, fabricate results, create fictitious references, or determine scientific conclusions. The authors remain fully responsible for the accuracy, interpretation, originality, references, scientific conclusions, and final content of the manuscript.

Conflict of Interest
The authors declare that there is no conflict of interest regarding the publication of this article.

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