Local Governments Facing Turbulence: Robust Governance and Institutional Capacities

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Abstract: Crisis environments, which are becoming systemic, pose significant challenges to local governments. The present study sought to present an academic contribution by introducing an analytical framework designed to scrutinize the institutional capabilities of local governance bodies in effectively responding to the emergent structural nature of crises within contemporary contexts. The study centered its attention on the concept of robust governance and accentuated a collection of factors that facilitate proficient public administration: contingency planning capacity, analytical capacity, organizational management capacity, and collaborative capacity. The paper presented a broad analysis of academic literature on the subject and it defined an analytical model for assessing local government capacities to deal with crises. One of the achievements of this work was the identification of key indicators that elucidate the institutional capabilities of local government bodies in addressing crisis environments. Through the examination of these indicators, the suggested analytical framework offers a comprehensive methodology for evaluating the readiness of municipal authorities in dealing with crisis situations. Furthermore, it enables comparative analysis of local government systems in analogous contexts, facilitating the identification of exemplary strategies for enhancing crisis management. The analytical model needs to be validated in further empirical studies.

Keywords: local government strategies; crisis environments; governance robustness; institutional capacities; effective local governance; evaluation; indicators analytical model

1. Introduction

1.1. Paper Scope and Structure

Climate change, energy, pandemic crisis, economic and social crises or migration, among others, are examples of the significant public issues that pose challenges to public governance in modern societies (Geddes et al. 2012; Falco and Kleinhans 2018). These issues often transcend political and administrative boundaries, presenting complex and evolving challenges for local government worldwide. Local environments, where the manifestation of these crises is particularly intense, require institutional and organizational characteristics that enable local governments to tackle crises with the highest probability of success (Schomaker and Bauer 2020).

The objectives of this paper are threefold. First, this paper aims to explore how turbulence and crises impact local governments and local public administrations. Second, it seeks to examine the concept of governance robustness and its prerequisites for sustainable local government strategies to cope with systemic crises. Finally, this paper intends to outline an analytical model that can evaluate the capacities of local government strategies in handling crises. The paper presents a broad analysis of academic literature on the subject and it defines an analytical model for assessing local government capacities to deal with crises. The main academic contribution of this paper was the design of an analytical model of key indicators affecting these institutional capacities of local government. The application of this organizational and institutional evaluation model offers an all-encompassing

methodology to assess the preparedness of local governments to cope with crisis situations. The model can provide insights into the effectiveness of different approaches, and it can help policymakers and administrators develop more effective crisis management strategies and policies. Future studies are needed to explore the application of the analytical model and this will enable researchers to identify the strengths and weaknesses of the model and refine it accordingly.

In order to make substantive contributions both in theory and practice, this paper is organized into the subsequent sections: Firstly, the next subsection reflects on the challenges posed by crisis environments to local government strategies. The second section introduces the theoretical framework of institutional capabilities for local government in turbulent environments. In the third section, we present our analytical model for the evaluation of local government robustness strategies. Finally, the conclusion section reflects on the strengths and weaknesses of the model and calls for future research in this area.

1.2. Crisis Environments as a Challenge for Local Governments

Local governments are facing a growing number of crises that are becoming systemic, posing significant challenges to their governance. These crises can range from environmental disasters to public health emergencies, economic recessions, social unrest, and energy crises among others. In the context of a local government, a crisis can be comprehensively defined as a combination of circumstances that significantly threatens the established institutional stability. This occurrence is characterized by its potential to disrupt the normal functioning of the local government, imposing severe challenges to its capacity in addressing public needs and delivering essential services. Such crises demand immediate attention and decisive actions, often placing substantial pressure on local authorities to devise effective and agile responses to mitigate adverse consequences and restore operational coherence. The implications of a crisis on a local government can be far-reaching, encompassing aspects such as public trust, resource allocation, and policy implementation, requiring an adaptive and coordinated approach to safeguarding the integrity of the institution and fostering resilience in the face of unforeseen disturbances. Crisis situations bring us closer to what in political science are called "critical junctures", which denote a period characterized by an accumulation of factors, events, or decisions that together engender a profound and enduring impact on the trajectory of policy development and implementation. Critical junctures possess the potency to bring about fundamental shifts in policy paradigms, institutional arrangements, and societal norms, thereby altering the prevailing path-dependence of policymaking. Such junctures are often marked by heightened uncertainty, contested interests, and the reconfiguration of power dynamics, leading to the emergence of new policy ideas or frameworks. These situations act as causal forces that propel transformative changes in public policy and evolution within public institutions.

Such challenges are complex and multifaceted, requiring a coordinated and effective response from local governments to mitigate their impact and prevent further damage. This context is not new for public sector organizations, which have traditionally experienced changes in turbulent environments. Changes are understood as 'situations where events, demands, and supports interact and change with high variability, inconsistency, and through unexpected and unpredictable pathways' (Ansell and Trondal 2018). What is new is the consolidation of such turbulence as a habitual, enduring, and not simply transitory characteristic of the environment in which public organizations operate (Scognamiglio et al. 2022).

One of the main challenges that local governments face when dealing with crises is the need to adapt quickly to change circumstances. Systemic crises are dynamic and unpredictable and require local governments to be agile in their response (Parker et al. 2020). In addition, they often require local governments to work collaboratively with other levels of government and stakeholders in the community to ensure that resources are used effectively and efficiently (Ohta et al. 2021). Furthermore, local governments must develop a comprehensive understanding of the crisis, including its causes, consequences,

and potential risks. They must also be able to communicate this information clearly and effectively to the public and other stakeholders to ensure that everyone is informed and engaged in the response. This requires strong communication and coordination mechanisms that can be deployed quickly in crises (Yang et al. 2022). Local governments must also be able to mobilize resources quickly to respond to crises. This includes financial and other resources such as personnel, equipment, and technology. Local governments need to have contingency plans in place that can be activated quickly in crises to ensure that they have the necessary resources to respond effectively (Keyes et al. 2022). Finally, local governments should be able to learn from their experiences in crises and apply these lessons to future crises. This requires a culture of continuous improvement and learning, where local governments are constantly evaluating their response to crises and identifying areas for improvement (Usoro and Razzak 2021; Yigitcanlar et al. 2021). By doing so, they can build greater resilience and better prepare for future crises.

These characteristics are essential to building a local government that is responsive, efficient, and inclusive, and that can meet the evolving needs of citizens. However, crises in the local environment pose significant challenges to local government strategies, requiring them to adapt and evolve to respond effectively:

First, crises can exacerbate existing social and economic inequalities, impacting the effectiveness of local government strategies. For example, public health emergencies such as COVID-19 have disproportionately affected marginalized communities, highlighting the need for local government strategies to be inclusive and equitable in their approach (Pierce et al. 2021).

Second, crises require local governments to be agile and adaptive in their response, which can be challenging for bureaucratic and hierarchical governance structures (Ramió 2022). Local government strategies need to incorporate flexible and responsive governance mechanisms that can be quickly activated in crises.

Third, crises require strong communication and coordination mechanisms, both within the local government and with external stakeholders. Local government strategies must prioritize the development of effective communication channels and collaboration mechanisms that can be deployed quickly in crises (Jiang et al. 2020).

Fourth, crises require local governments to mobilize resources quickly and effectively (Park et al. 2022). Local government strategies need to incorporate contingency planning and resource mobilization mechanisms that can be quickly activated in crises.

Fifth, crises require local governments to develop a comprehensive understanding of the crisis and its potential risks and consequences. Local government strategies need to incorporate data analysis and risk assessment mechanisms that can provide accurate and timely information about crises (Curran and Smart 2020).

Finally, crises can disrupt the data infrastructure, which is crucial to local government strategies (Kanbara and Shaw 2021). For example, natural disasters or cyberattacks can cause data breaches or loss, making it difficult to collect, process, and analyze data. In such situations, local governments must develop alternative methods for collecting and analyzing data to make informed decisions (Mees et al. 2019).

2. Theoretical Framework: Institutional Capabilities for Local Government in Turbulent Environments

2.1. Robustness and Robust Governance

It is relevant to analyze how local governments may be generating the aforementioned types of responses in terms of adaptation and development of new capabilities to face the contexts of turbulence. In the development of these types of responses within the realm of public policy and management, concepts such as policy robustness or governance robustness have emerged strongly (Ansell et al. 2022; Capano and Toth 2022; Trondal et al. 2021; Capano and Woo 2018; Ferraro et al. 2015). The inclusion of the term robustness serves to mark differences in relation to resilience, which is widely used when considering strategies developed to address more cyclical crisis moments, in order to incorporate a

certain combination of permanence and transformation aimed at offering new responses to environments characterized by turbulence (Elston and Bel 2022; Capano and Woo 2017; Duit 2016; Ansell et al. 2015).

The application of the term robustness in the field of governance has been proposed in terms of a deliberate endeavor to foster effective problem-solving through the strategic establishment of institutional structure, offering mechanisms and procedures that facilitate adaptable adjustment to challenging circumstances and innovative exploration and exploitation of emerging possibilities (Ansell et al. 2021). Following this approach, the development of robust governance as a strategy to generate new responses to the turbulent environment requires impacting both the organizational design and the dynamics that may promote the behaviour of the actors in accordance with the transformation model being pursued (Capano and Toth 2022; Gofen and Lotta 2021).

The contributions made from different academic perspectives allow one to characterize the concept of robustness. In political science, the idea of robustness is proposed as the ability of a system to invent and reinvent public policies when facing new challenges, responding dynamically (Howlett and Ramesh 2023; Sørensen and Ansell 2021; Howlett et al. 2018). From a local government perspective, the need to define and deploy robust strategies that enable facing turbulence while continuing to create public value through versatile adaptation, adjustment, and pragmatic redirection of governance solutions is highlighted (Ansell et al. 2021). From a managerial perspective, attention is focused on configuring flexible organizations based, among others, on collaboration networks and decentralized responses (Ansell et al. 2021; Capano and Woo 2018). Boswell et al. (2022) emphasized the importance of communication and citizen involvement in designing robust governance to face new challenges (such as climate change, for example).

Based on these approaches, the distinctive feature of the concept of robustness is the ability to achieve a balance between stability and change. Following Ansell et al., robust governance systems need to be capable of adapting to maintain their functionality despite crisis environment; however, in order to accomplish this, they must furnish the framework and infrastructure that aid in sustaining and engendering change (change necessitates stability) (Ansell et al. 2022). In this sense of the concept of robustness, stability should not be understood as rigidity but as the persistence over time of a function or objective, beyond the challenges that arise. However, the maintenance of this function or objective is likely not to occur in its original form, but it can be revised, expanded, or redefined according to changing circumstances. Similarly, change should not be conceived merely as reactive or incremental, with a will to restore the previous situation, but as an innovative and proactive character orientated towards achieving flexible adaptation that takes advantage of the opportunities of turbulence to revise previous dynamics. In other words, robustness is associated with a local governmental character that is orientated towards exploring unforeseen developments from turbulence (Scognamiglio et al. 2022).

2.2. Local Government Strategies for Robust Governance

The concept of "local government" used herein refers to a distinct level of government within a political system that operates at the subnational level, encompassing territorial subdivisions such as municipalities, counties, or districts. Rooted in the principles of decentralization, local government exercises a measure of administrative autonomy and possesses defined responsibilities for providing essential public services, implementing policies, and addressing local community needs. Operating within the framework of national or regional laws, local governments are entrusted with decision-making authority over matters pertaining to local infrastructure, public safety, education, healthcare, and other essential services. As an integral component of multi-level governance, local governments play a pivotal role in enhancing democratic participation, fostering community engagement, and promoting responsive policymaking, thereby facilitating the efficient delivery of services tailored to the distinct demands and preferences of specific geographic areas.

The analytical model proposed in this paper aimed to evaluate how medium or large local governments deal with crisis situations, taking into account their institutional capacity, resource allocation, and strategic planning. This model proved particularly suitable for such local government entities due to their established administrative structures, greater resource endowment, and enhanced capacity for self-organization. Medium and large local governments typically possess the requisite bureaucratic machinery, human capital, and financial resources that enable them to swiftly mobilize and coordinate responses to crisis events, thereby effectively addressing emergent challenges. Moreover, their organizational infrastructure fosters a collaboration with diverse stakeholders, facilitating the adoption of comprehensive and targeted crisis management strategies. However, while the model can offer valuable insights in the context of medium or large local governments, its application to small municipalities may be less fruitful. These smaller entities, constrained by limited resource capacity and organizational complexity, often encounter impediments in mounting effective responses to crises. Their restricted financial resources may hinder the implementation of robust contingency plans, and their narrower administrative setup might compromise the efficacy of crisis coordination efforts.

The role of local government in crisis environments requires certain strategies associated with both its institutional design and behaviour in relation to the actors involved in the different lines of public action. In the first approach (Capano and Toth 2022), in order to face turbulent environments, it is necessary: (a) to have proactivity (to anticipate scenarios), (b) to have agility in responses offered both in the short- and medium-term, (c) to have flexibility to adjust behaviours as well as to relocate strategic resources, and (d) to develop rapid learning of new knowledge that can be immediately applied to the situation being faced.

Following the argument previously presented, current organizational paradigms in public administrations do not allow these requirements to be adequately met, making it necessary to deploy strategies that promote them. From various contributions, a series of strategies have been proposed to develop robust governance (Howlett and Ramesh 2023; Capano and Toth 2022; Carstensen et al. 2022; Ansell et al. 2021; Chandra and Paras 2021; Capano and Woo 2018; Duit 2016), among which the following stand out.

1. Scalability is understood as the flexibility to mobilize and demobilize resources, or to reassign them according to the identified needs at each moment, in an agile manner and aligned with the organization's objectives. The flexibility strategy can also incorporate resources from the organization itself or from actors in the environment who are involved in developing responses to turbulence. The development of this strategy requires the generation of trust among the different actors involved, both internally, with reference to different professional groups, and externally, with the network of agents involved in the proposed responses.

2. Experimentation with reference to the exploration and testing of solutions that generates knowledge to configure alternatives' final design to face challenges. This strategy is associated with the development of prototypes of new responses that can be evaluated through testing and reviews before their eventual extension. Considering the temporal challenge of robust governance, short-term responses to face turbulence can also be considered experiments, overcoming incrementalism logic, and deploying tactics to build strategy.

3. The transformation of organizational relationship models (both internal and external), based on coordinated autonomy and the idea of polycentricity, aims to achieve a new distribution of competencies and functions to facilitate a shared commitment. The objective is to promote the emergence of innovative proposals from different actors of the network and encourage their involvement. This strategy proposes to complement autonomy with coordination, which allows for the identification of the most appropriate responses and, eventually, their generalization for the rest of the actors involved.

4. The promotion of adaptability of norms, preserving the safeguarding of values and stability they provide, but avoiding rigidity and delay in offering new responses. This strategy deploys the balance between stability and change that characterizes robust governance. This strategy implies the continuous evaluation of rules to ensure their validity and added value, simplifying the regulatory framework by eliminating those that no longer add value, and updating the most relevant ones. Additionally, there is also a proposal to encourage the discretion of managers and professionals to interpret the rules, but always based on an adequate understanding of their purpose and the values they imply.

5. Encouragement and training to generate innovative responses, that is, to develop skills for improvisation and rapid learning. This strategy includes stimulating thinking that goes beyond the framework established by the predominant dynamics in the organization (thinking outside the box), for example, by incorporating experts with heterogeneous profiles that facilitate the contrast of perspectives. A strategy that also includes the promotion of improvisation, and overcoming environments with excessive regulation or protocols that restrict individual discretion. Along the same line, the strategy can also incorporate rapid learning, with institutional designs aimed at promoting research, reflection, monitoring, and evaluation focused on continuous improvement to learn from the results obtained and the processes that led to them (report culture).

All these strategies to develop robust governance are not exclusive but complementary, and their development depends on several factors (such as public organizational context and situation, the nature of crisis, leadership, resources, among others) that must be analyzed to evaluate their capacity to face turbulence.

3. An Evaluative Framework for Appraising the Robustness of Local Government

3.1. Institutional Capacities for Local Government Robustness

Strategies described in the previous section emphasize an organization's ability to adapt to the challenges posed by turbulence rather than just facing them or recovering from them. The deployment of these strategies in local governments reveals their interconnections, highlighting their complementarity and the need to combine them according to the organizational reality or the nature of the turbulence to be faced.

Our analytical proposal posits that to tackle the challenge of crisis environments, local governments must deploy institutional capabilities that reinforce them to identify the problems, select appropriate strategies to cope with them, articulate these alternatives, and measure their impact (Knill et al. 2020; Wu et al. 2017). The analytical model presented in this section seeks to address the following inquiry: What institutional capacities should be in place as prerequisites to promote consistent strategies to cope with crisis environments? The presented argument underscores the significance of four institutional capabilities that influence the institutional framework of local government actions: contingency planning capacity, analytical and data management capacity, organizational management capacity, and collaborative or network management capacity. In order to evaluate these capacities at the local level, our model delineates various essential indicators that provide insights into the existence of these components.

As the United Nations Development Program (UNDP) points out, institutional capacity denotes an institution's ability to: "(a) perform its activities consistently, manage changes and crises, and maintain performance over time, (b) offer responses that can enhance its areas of operation, and (c) provide a framework for developing the required change" (UNDP 2021). Various academic perspectives exist for analyzing the capacities of public organizations. A preliminary classification discerns between those focusing on public policies and the associated network of stakeholders, and those emphasizing the attributes of public institutions. This investigation introduces the notion of institutional capacity, which integrates both perspectives and evaluates them from the standpoint of local administration.

The notion of governance capacity exemplifies notions associated with the public policy approach and the system of actors, encompassing the array of systemic and organizational resources essential for policymaking and its implementation (Ramesh et al. 2016; Howlett and Ramesh 2016). In addition, the concept of policy capacity denotes the availability, quality, and nature of resources that facilitate the scrutiny of policies, evaluation of policy options and their ramifications, and promote strategic decision process (Howlett 2015). Moore's classification of policy capacities (Moore 1995), which is enshrined in the model by Wu, Ramesh, and Howlett (Wu et al. 2017), recognizes three primary capabilities, namely analytical, operational (or managerial), and political. These competencies comprise resources that can be classified into the individual, organizational, and systemic domains. Consequently, the traditional analytical framework used in public policy analysis arises from the combination among the three categories of capabilities.

The integration of insights derived from the aforementioned perspectives enables the identification of institutional capacities of local governments to address the challenges associated with formulating, implementing, and assessing policies and programs in turbulent environments. Our analytical model departs from four crucial capacities that have been emphasized by the academic literature adapted to the local government context: strategic contingency planning capacity, analytical capacity, organizational management capacity, and collaborative capacity.

The first is contingency planning capacity, which refers to a strategic management instrument used to prepare for potential future events or crises. It involves a structured and systematic approach to identify and evaluate risks, vulnerabilities, and potential impacts on an organization's operations, services, and stakeholders. This form of planning facilitates the formulation of alternative courses of action, in case the primary strategy cannot be executed as planned, and includes measures to mitigate, respond, and recover from adverse effects. Strategic contingency planning is an ongoing process that involves continuous monitoring and assessment of the environment, and the implementation of revisions to strategies and plans as necessary. This approach is particularly important in volatile and uncertain environments, where unforeseen events can have significant consequences on an organization's operations, reputation, and sustainability (Pearce and Zahra 1992). To achieve this objective, politicians and public managers must combine precision in goal setting with suitable elaboration at the operational level, affecting all levels of the organization (Howlett and Walker 2012). The formulation of planning and leadership strategies is grounded in robust information frameworks, which are likewise associated with analytical proficiency. This facilitates the formulation of agile and adaptable proposals that foster learning and innovation, as described by Mayne et al. as a "reflective-improvement capability" (Mayne et al. 2020).

Analytical capacity, the second one, can be related to effectively acquire, manage, and utilize diverse kinds of data and evidence to enrich the decision-making process and enhance public action through acquiring enhanced understanding of the external context, internal circumstances, and performance outcomes (Mayne et al. 2020). This capacity entails crucial components, such as having professionals with the necessary skills. These professionals should also be related to a central advisory entity (Ramesh et al. 2016; Ramió 2018). Moreover, the organization needs to establish an appropriate organizational structure and guarantee the presence of tools and procedures to acquire and process data and information and, subsequently, disseminate and utilize them. Information systems that are linked to data collection, processing, analysis, and presentation in various formats to different audiences play a critical role in sustaining analytical capacity (Salvador and Ramió 2020).

The effective analytical capacity should lead to the implementation of data governance. While the literature provides various interpretations of data governance, there is a general agreement that it involves: (1) recognizing data as an organizational asset that requires management, (2) establishing influential responsibilities and associated responsibilities, and (3) enforcing principles and benchmarks that ensure data quality and proper utilization

(Otto 2011a). Accordingly, data governance is linked to organizational systems that allocate decision-making responsibilities in alignment with the organization's priorities, promoting correct behaviours that recognize data processing as a crucial asset for the organization (Otto 2011b). The technological organizational structure, and human resources, in terms of expertise and knowledge, are both essential to this end. In turbulent environments, data can be a critical resource for informing decision-making, resource allocation, and operational planning. Effective data governance in turbulent environments requires a clear understanding of the types of data that are necessary and relevant for addressing the specific challenges of the crisis, as well as the sources, quality, and integrity of that data. This involves establishing mechanisms for data collection, storage, sharing, and secure analysis, efficient, and interoperable (Choenni et al. 2022). Additionally, data governance in these environments requires the development of contingency plans for unexpected disruptions to data systems and processes.

Organizational management capacity involves effectively coordinating of resources and activities to achieve strategic objectives (Otto 2011b). This capability is linked to "pragmatic leadership theory" (Hofstad and Vedeld 2021; Antonakis and House 2014) and encompasses the management of administrative structures, budgets, human resources, and organizational systems. In this capability, within the framework of a local crisis, the initial concern pertains to the establishment of adaptable organizational frameworks and the anticipation of roles dedicated to risk management. The subsequent concern relates to organizational procedures and dynamics, emphasizing their alignment with the imperatives of agile responses. The third issue relates to human resource management, including internal information systems and communication policies related to risk management, as well as socialization and learning dynamics in this area.

Collaborative capacity is associated with the skills required to foster network activities that involve external actors in the promotion of public action. This capability is associated with the efforts of cities to involve and inspire diverse interrelated actors, encompassing private enterprises and civil society organizations (Hofstad and Vedeld 2021; Antonakis and House 2014). Effective deployment of this capacity in crisis environments entails the creation and quick distribution of exchange of information among the actors engaged in the network, coordination, and shared decision-making protocols to collaboratively tackle pressing challenges. The assessment of this capability is predicated on its extent in terms of comprehensiveness (taking into account the number and nature of involved actors, both internal and external) and the depth of the reciprocal exchange relationships among them (Mayne et al. 2020). Collaborative capacity must also encompass the generation of dynamics that involve citizens, the sharing of responsibilities, and the establishment of common objectives, wherein public administrators serve as facilitators of networked interaction and mutual learning, fostering innovation, augmenting operational capability, and enhancing the legitimacy of public action during times of crisis (Torney 2018). This can be encouraged through inclusive participatory mechanisms that promote the integration of the citizen perspective in the decision-making process. Lastly, the capacity for collaboration necessitates the establishment of a transparency and accountability framework in order to be able to account for the actions taken to address the crisis.

The four capacities described have distinct impacts on the strategies and activities facing a crisis environment, but they are mutually dependent on one another. Consequently, they should be viewed as an integrated whole that, through their interplay, serves as a prerequisite that reinforces local authorities to improve governance framework to tackle the issues posed by the local crisis.

3.2. Identification of Indicators for Each Analyzed Institutional Variable

To establish an analytical framework and assess these capacities at the local level, our model suggests a set of key indicators for each capacity. Each of the proposed indicators is, in turn, an enabler of one of the five local government strategies for robust governance

described in Section 2.2 of the paper (Scalability, Experimentation, Polycentricity, Norm adaptability, and Learning).

Variable 1. Contingency planning capacity

Indicators:

1.1. Contingency planning and protocols: Existence of contingency plans or protocols for crises that prioritize the development of anti-crisis actions over the execution of routine plans or programs.

This indicator identifies the existence of contingency plans or protocols for crises. Such plans prioritize the development of anti-crisis actions over the execution of routine plans or programs. The development of such plans enables local governments to proactively respond to crises, ensuring the continuity of essential services, minimizing damage, and reducing the impact of the crisis on the local community (Cotterill et al. 2020). As both planning and protocols inform about resource redistribution and reflect knowledge derived from previous tests and prototypes, this indicator is closely related to both scalability and experimentation local government strategies for robust governance. An example of contingency plans or protocols is the existence of plans against cyber-attacks. These plans encompass comprehensive strategies and protocols designed to safeguard information systems, networks, and critical infrastructures from malicious digital intrusions. Rooted in the principles of cybersecurity, these plans integrate proactive measures, incident response protocols, and risk management frameworks to bolster resilience against cyber threats. By adopting a multi-layered approach and fostering collaboration between stakeholders, plans against cyber-attacks seek to mitigate the adverse impact of cyber incidents and ensure the protection, confidentiality, and integrity of sensitive information in the digital realm.

1.2. Policymakers trained in risk management: Existence of policymakers with training and/or experience in risk management or crisis management.

This indicator identifies the existence of risk and crisis management experience in the organization's structure. Policymakers with training or experience in risk management or crisis management are essential due to the critical role they play in developing and implementing effective policies and procedures to face it (Abdullah and Kim 2020). The existence of such policymakers informs local government capacities to identify potential risks and develop strategies to mitigate them. Furthermore, they can develop contingency plans and protocols for crisis situations, thereby ensuring that they are well prepared to handle any unexpected events that may occur. Due to content and dynamics associated with training and/or experience in risk management, this indicator is a key factor to inform about learning local government strategy. To operationalize this indicator, for example, an exhaustive study of the educational and experiential profile of the public institution's managers can be carried out.

1.3. Economic resource allocation: Budget linked to contingency plans to sustain anti-crisis actions.

The indicator focuses on the degree of flexibility about economic resources choices. Specifically, it evaluates the extent to which sufficient resources are allocated to anti-crisis-planning action programs, highlighting the prioritization of such allocations. The indicator serves to identify the capacity to effectively mobilize resources, particularly through the prioritization of adequate economic resources for the implementation of programs (Obrenovic et al. 2020). The existence of economic resources linked to contingency plans is essential to all local government anti-crisis strategies and as an indicator, it especially related to scalability strategy for robust governance. To inform this indicator, we can identify defined budget lines to deal with contingencies, or the existence of streamlined processes or protocols to establish these budget lines in case of need.

Variable 2. Analytical capacity

Indicators:

2.1. Organizational Data Units: Specialized data analysis departments, staffed with sufficient personnel.

Data are a crucial component of enhanced decision-making processes and the advancement of public action to combat crises. This indicator serves to identify the presence of a specialized organizational unit or professional team equipped with analytical skills, sufficient resources, and appropriate levels of organizational support. By offering comprehension into the capacity of public organizations to acquire, handle, and employ data and evidence from various sources, this indicator facilitates an understanding of the extent to which a team of skilled professionals, legitimized across organizational hierarchies, can contribute to this effort (Golubetskaya and Kurlov 2021; Picciotto 2020). Due to the role related to specialized data analysis and management units in terms of knowledge sharing and promotion and supervision activities, this indicator informs about coordinated autonomy strategies of local government for robust governance. An example of operationalization of this indicator is the detection of municipal data analysis offices or the organizational foresight of management figures such as the chief data officer.

2.2. The information system: Availability of a robust information system that effectively acquires, processes, disseminates, and leverages data and information.

This indicator identifies the presence of reliable information systems that support data collection, processing, analysis, and presentation in appropriate formats to diverse stakeholders, thereby promoting analytical capacity. It aligns with a key variable highlighted in the academic literature concerning the development of planning and leadership strategies grounded in robust information structures. This affords flexibility and adaptability, enabling learning and adjustments in public policies at the local level. Overall, this indicator provides insight into the existence of an effective organizational architecture that supports redundant systems that can be activated in the event of a data infrastructure disruption (Fatollahzadeh et al. 2021). Even if the availability of a robust information system is essential for all local government strategies, scalability becomes one of the highlighted initiatives to be informed by this indicator. The existence of applications specifically designed to support these information systems is an example that operationalize this indicator.

2.3. Data-driven decisions: Presence of organizational processes that enable data-informed decision-making aligned with anti-crisis policy objectives.

This indicator assesses the capacity of an organization to generate its own data, drawing from diverse departments and external actors, and to establish systematic processes that enable decision-making based on these data and evidences. An essential element in assessing analytical capacity lies in establishing guidelines and standards that ensure the quality of data and appropriate utilization (Otto 2011a). The existence and results of data-driven decision-making processes is a key indicator to inform about local government strategies such as developing skills for improvisation and rapid learning and to enhance relationships model (both internal and external) for robust governance. The existence of "situation rooms", which promote the sharing of data and decisions in a cross-cutting manner, is a clear example of the operationalization of this indicator.

Variable 3. Organizational management capacity
Indicators:
3.1. Coordination systems: Presence of mechanisms for coordination, negotiation, and information exchange among internal units that foster interdisciplinary initiatives, aiming to formulate novel strategies and monitor implemented actions.

This assesses the capacity of an organization to respond to the requirements of its anti-crisis strategy by evaluating its internal processes and dynamics. It measures the ability of different units to adapt and streamline their activities to promote the development of cross-cutting policy actions in turbulent environments (Goren et al. 2022). This indicator provides insight into the organization's coordination and communication abilities and how effective is the collaboration between units. This indicator is essential to inform about coordination autonomy strategies for robust governance. The presence of transversal commission or committee represents, for example, a dynamic and inclusive mechanism that fosters inter-departmental collaboration and coordination in addressing complex and multifaceted issues

that transcend the purview of individual administrative units. This committee functions as a platform for various departments, agencies, and stakeholders to converge, pooling their expertise and resources to collectively tackle challenges that necessitate a comprehensive, cross-cutting approach. By fostering horizontal communication and synergy, a transversal commission facilitates the integration of diverse perspectives, streamlines decision-making processes, and enhances the efficacy of policy implementation.

3.2. Flexible personnel management: The presence of initiatives concerning communication, training, and skill enhancement linked to risk management, and adaptability in terms of personnel allocation according to the emergence of unforeseen needs.

The effective management of risk in local government requires specific actions aimed at improving communication systems, education, and the improvement of capacities related with risk management and adaptability (Dolamore et al. 2020). This indicator highlights the importance of such actions and how they contribute to ensure that the appropriate volume of human resources is allocated to address unforeseen needs. This includes the recognition of key skills and the introduction of programs aimed at improving these skills among staff, as well as the provision of appropriate personnel to support crisis response. The development of such actions can support the establishment a culture of robustness within local government organizations, promoting effective decision making and enhancing the overall capacity to manage risk. Flexible personnel management concreted in the abovementioned actions is a key indicator for local government strategies such as scalability and learning, and also to encourage innovative responses. The operationalization of this indicator involves identifying initiatives that enable, for example, the resizing or relocation of personnel in cases of necessity. Having the ability to adjust the workforce size or redistribute personnel to areas of higher demand ensures that essential services can be efficiently delivered and critical functions adequately staffed. Additionally, resizing or relocating personnel can optimize resource allocation, preventing redundancies and improving overall operational efficiency.

3.3. Regulatory flexibility: The ability to adapt norms and regulations to the needs arising from the crisis.

This indicator highlights the importance of the governments' capacity to adjust the legal framework to respond effectively to the crisis. The ability to adapt to changing situations is key to ensure that regulations are not a hindrance but rather a facilitator in addressing the challenges posed by a crisis. It is necessary to establish mechanisms that allow for a flexible response and adaptation to the specific circumstances of each situation. The regulatory framework must be designed in a way that enables it to be modified quickly to respond to the challenges presented by crises (Picciotto 2020), while maintaining its coherence and consistency with the overall objectives of the policy. Effective communication with stakeholders and citizens is also crucial to ensure that regulatory changes are understood and implemented correctly. This indicator is essential to inform about norm adaptability robust governance strategy that aims to safeguard of values and stability they provide, but avoiding rigidity. One way to operationalize this indicator is to identify regulations that allow, in exceptional situations, the modification of procedures or deadlines. For example, enabling exceptional modalities of public procurement in the context of crisis.

3.4. Encouraging experimentation: Existence of experimental programs integrated into management strategies, such as pilot tests, living labs, or experiments.

This indicator assesses whether local governments have implemented such experimental programs in a systemic way as part of their management strategies, and if they are integrated into their policy-making processes. Experimental programs allow local governments to develop and test new solutions in real-life situations, which can lead to better problem-solving approaches and improve service delivery (Nesti 2018). The integration of such programs into management strategies ensures that they are used to their full potential and their outcomes are applied systematically. The existence of such programs is,

therefore, a crucial indicator of the local government's innovation capacity and its readiness to engage in experimentation and innovation in a dynamic and evolving environment, as local government strategies for robust governance. Examples of operationalizing this indicator include the existence of innolabs or protocols for prototyping new public services. Innolabs, as collaborative spaces dedicated to experimentation and problem-solving, offer local governments a platform to explore novel approaches, technologies, and service delivery models, thereby catalyzing the development of cutting-edge solutions to complex societal challenges. Through systematic protocols for prototyping new public services, local governments can test and refine ideas in controlled environments, minimizing risks and resource wastage while maximizing the effectiveness of policy interventions.

Variable 4. Collaborative capacity

Indicators:

4.1. The administration of external networks: The presence of a clear and articulated approach to managing the network of external actors to be able to quickly coordinate anti-crisis actions.

This indicator analyzes the public organization capability to manage the network of external actors effectively. This is achieved through establishing communication channels with different organizations, including public, private, and third-sector actors, for the exchange of ideas and best practices that can be applied to the development of local anti-crisis initiatives (Dolamore et al. 2020). The concrete evidences of this indicator inform about transformation of organizational relationship models strategy for robust governance. The operationalization of this indicator involves identifying, for example, the allocation of responsibilities in the relational management of stakeholder networks or the definition of protocols for external relations, as well as the provision of guidelines for generating administrative agreements within the framework of multi-level governance.

4.2. Citizen participation and accountability: Participatory mechanism as antennae or sensors of situations that could lead to social crises and to face it and presence of systems for accountability and transparency in the design, implementation, and evaluation of anti-crisis actions.

This indicator evaluates the organizational ability to integrate citizens' perceptions and evaluations into the diagnosis and policy design. In this regard, the collaborative capability encompass the establishment of strategies that engage citizens and the generation of agreed objectives. The promotion of participation strategies that encourage the integration of citizen viewpoint in the policy process reinforces this approach. Therefore, a transparent governance model is necessary to promote this critical perspective, while promoting the legitimacy of government action despite the crisis (Schmidt and Wood 2019). As in the previous case, this indicator is essential to provide evidences of organizational relationship model changes as local government strategy for robust governance. Examples of operationalizing this indicator include the existence of open-participation mechanisms such as sectoral roundtables, establishing deliberative systems such as minipublics, defining digital platforms for citizen deliberation, or creating spaces to promote transparency and accountability.

The proposed analytical framework (sintetized in Table 1) aims to validate the capacity of local government to deal with crisis situations. Through the set of indicators described in the previous section, the analytical framework allows us to identify how each of the four institutional capacities has contributed to the local government's ability to design, execute, and assess effective anti-crisis policy actions. While these capacities do not guarantee the success of such policies, they represent a necessary prerequisite for local governments to address the challenges generated by turbulent environments.

Table 1. Variables and indicators for robust governance institutional capacities.

Variable/Indicator	Description
Variable 1. Contingency planning capacity	
1.1. Contingency planning and protocols	Existence of contingency plans or protocols for crises that prioritize the development of anti-crisis actions over the execution of routine plans or programs
1.2. Policymakers trained in risk management	Existence of policymakers with training and/or experience in risk management or crisis management
1.3. Economic resource allocation	Budget linked to contingency plans to sustain anti-crisis actions
Variable 2. Analytical capacity	
2.1. Organizational Data Units	Specialized data analysis departments, staffed with sufficient personnel
2.2. The information system	Availability of a robust information system that effectively acquires, processes, disseminates, and leverages data and information
2.3. Data-driven decisions	Presence of organizational processes that enable data-informed decision-making aligned with anti-crisis policy objectives
Variable 3. Organizational management capacity	
3.1. Coordination systems	Presence of mechanisms for coordination, negotiation, and information exchange among internal units that foster interdisciplinary initiatives, aiming to formulate novel strategies and monitor implemented actions
3.2. Flexible personnel management	Presence of initiatives concerning communication, training, and skill enhancement linked to risk management, and adaptability in terms of personnel allocation according to the emergence needs
3.3. Regulatory flexibility	The ability to adapt norms and regulations to the needs arising from the crisis
3.4. Encouraging experimentation	Existence of experimental programs integrated into management strategies: pilot tests, living labs, experiments
Variable 4. Collaborative capacity	
4.1. Administration of external networks	The presence of a clear and articulated approach to managing the network of external actors to be able to quickly coordinate anti-crisis actions
4.2. Citizen participation and accountability	Participatory mechanism as antennae or sensors of situations that could lead to social crises and systems for accountability and transparency in the design, implementation, and evaluation of anti-crisis actions

In order to test the analytical framework based on the identified indicators, we propose to employ a qualitative approach through the development of case studies. A case study is a comprehensive system that investigates a research topic within its contextual setting (Byrne and Ragin 2009), chosen as a typical example due to the nature of the research questions (Yin 2009). In this type of study, the focus is to examine a specific system, namely, the anti-crisis strategy promoted by a local administration, through an in-depth collection of data from various sources, such as policy documents, strategic action plans, monitoring and evaluation reports, and web-based information systems, in addition to conducting in-depth interview, and group meetings. Through this approach, a detailed and analytical description of the object of study was produced in line with the research objectives of the institutional capacities (Creswell 2018).

4. Conclusions

Local governments must deal with an environment where crises are increasingly persistent. Turbulent environments present substantial difficulties to local governance policies. They require local governments to be agile, adaptive, inclusive, and equitable in their approach, with flexible and responsive governance mechanisms in place. Strong communication and collaboration mechanisms, contingency planning, and resource mobilization mechanisms are also crucial. Local government strategies must incorporate data analysis and risk assessment mechanisms to provide accurate and timely information about crises. By doing so, local governments can develop effective crisis management strategies and ensure the safety and well-being of their communities.

The proposed analytical framework provided relevant insights to inform about local government capacities to deal with crisis situations. Through the set of indicators described in the previous section, the analytical framework allowed us to identify how each of the four institutional capacities has contributed to the local government's ability to design, execute, and assess effective anti-crisis policy actions. While these capabilities do not ensure the success of such policies, they embody an essential prerequisite for local governments to confront the challenges arising from crisis environments. The aim of this work was to construct this analytical framework for scrutinizing the institutional capabilities of local government systems in dealing with crisis environments. The study highlighted the need to explore the various capabilities that these systems possess, including contingency-planning capacity, analytical capacity, organizational-management capacity, and collaborative capacity. In doing so, the paper contributed to the body of knowledge on crisis management in the sphere of local governments. The institutional model presented in this paper provided a valuable tool for evaluating local government robustness. By considering the organizational and institutional characteristics of the system, the model allowed us to identify areas of strength and weakness and provided insights into the effectiveness of different strategies and policies. Furthermore, it can be employed to evaluate the performance of local government systems in comparison to other systems in analogous contexts and ascertain exemplary approaches for enhancing crisis management.

One of the notable contributions of this study was the discernment of key indicators that impact the institutional capabilities of local government systems. These include the availability of technological infrastructure, the quality of human resources, and the effectiveness of the governance framework. Through the analysis of these indicators, the proposed analytical framework offers a comprehensive approach to evaluate the readiness of local governments in addressing crisis. Crisis environments require local governments to structure a comprehensive view of the crisis environments and its potential risks and consequences. In our analysis, we attempted to define and study how local government strategies need to incorporate data analysis and risk assessment mechanisms that can provide accurate and timely responses to crisis situations.

Our model was designed for medium or large local governments, due to their established administrative structures, greater resource endowment, and enhanced capacity for self-organization. However, its application to small municipalities may be less fruitful, because of the limited resource capacity and organizational complexity. Consequently, the model's suitability for assessing responsiveness in medium or large local governments cannot be readily extrapolated to small municipalities, warranting a contextualized and tailored approach when evaluating crisis management dynamics in such contexts.

A key aspect we would like to emphasize is that as an integral component of multi-level governance, local governments play a pivotal role in enhancing democratic participation, fostering community engagement, and promoting responsive policymaking, thereby facilitating the efficient delivery of services tailored to the distinct demands and preferences of specific geographic areas. We, therefore, tried to consider in our analysis the importance of the multilevel governance logic in which local government is immersed through the identification of relational management capacities in multilevel environments. Through indicators such as those relating to our variable 4 "Collaborative capacity", we identified

the presence of a clear and articulated approach to managing the network of external actors in a multilevel governance context. However, it should be noted that this model was designed to assess the capacities of a local institution, not to measure the capacity of a sectoral network to respond to a crisis situation, which would require another type of analytical approach closer to policy network analysis.

Although the proposed analytical framework has the potential to contribute significantly to the field of crisis management, further research will be necessary to validate and improve its effectiveness. While institutional capacities are prerequisites for effective anti-crisis policy at the local level, their impact on the success of these policies requires further investigation. Future research can build upon this study by validating the proposed framework and identifying areas for improvement. Finally, the goal is to apply this analytical model to enhance the preparedness of local government systems in addressing crises, thereby contributing to the safety and wellbeing of society through robust governance responses.

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