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Governing Urban Resilience in Mexico City: From Strategy to Practice in the 100
Resilient Cities Initiative

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Adriana Isabel Hernández Carranza

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Dr. Sebastian Fastenrath

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Abstract

As global urbanisation accelerates, cities face increasing pressure on urban systems and growing vulnerability to natural disaster, climate change, and socio-economic threats. These risks are often exacerbated by inadequate planning and governance strategies. Urban resilience has emerged as a key framework to address such challenges, but the effectiveness of global initiatives in driving resilient and sustainable transitions remains contested. This study examines Rockefeller Foundation's 100 Resilient Cities (100RC) initiative in Mexico City over the decade following its adoption in 2013. Through document analysis and expert interviews, it explores the translation of the initiative into local policy, as well as political and power dynamics, how it shaped the understanding of urban resilience, and whether it created the conditions for adaptive and transformational change. Findings reveal a paradox: while 100RC introduced an innovative urban governance model into Mexico City's public policy with potential for catalysing change, it did not lead to a durable transformation due to political transitions and funding dependencies. Outcomes were mostly intangible and lacked durability, focusing largely on environment and earthquake risk management, with limited attention to socio-economic inequalities. The absence of monitoring mechanisms further challenged the evaluation of progress. This case demonstrates both the potential and limitations of global urban resilience initiatives, emphasising the need for adaptation to local governance contexts and stronger continuity frameworks, in parallel to sustained political commitment and accountability to ensure adaptive and transformational change.

Keywords: *urban resilience; urban governance; governance experimentation; 100 Resilient Cities; resilience initiatives; sustainable transitions; urban sustainability; Mexico City*

Abstract (German)

Mit der zunehmenden globalen Urbanisierung sind Städte wachsendem Druck auf ihre urbanen Systeme, einer steigenden Anfälligkeit gegenüber Naturkatastrophen, dem Klimawandel sowie sozioökonomischen Bedrohungen ausgesetzt. Diese Risiken werden häufig durch unzureichende Planungs- und Governance-Strategien verstärkt. Urbane Resilienz hat sich als ein zentrales Konzept zur Bewältigung dieser Herausforderungen herausgebildet, doch die Wirksamkeit globaler Initiativen zur Förderung widerstandsfähiger und nachhaltiger Transformationen bleibt umstritten. Diese Studie untersucht die Initiative „100 Resilient Cities“ (100RC) der Rockefeller Foundation in Mexiko-Stadt im Jahrzehnt nach ihrer Einführung im Jahr 2013. Mittels Dokumentenanalyse und Experteninterviews wird die Umsetzung der Initiative in lokale Politikprozesse untersucht, ebenso wie politische und machbezogene Dynamiken, ihr Einfluss auf das Verständnis urbaner Resilienz sowie die Frage, ob sie Bedingungen für adaptive und transformative Veränderungen geschaffen hat. Die Ergebnisse zeigen ein Paradox: Obwohl 100RC ein innovatives Modell urbaner Governance in die Politik von Mexiko-Stadt einführte und Potenzial zur Förderung von Veränderungen bot, führte die Initiative aufgrund politischer Übergänge und finanzieller Abhängigkeiten nicht zu einer dauerhaften Transformation. Die Ergebnisse blieben größtenteils immateriell und wenig nachhaltig, mit einem Schwerpunkt auf Umwelt- und Erdbebenrisikomanagement, während sozioökonomische Ungleichheiten nur begrenzt berücksichtigt wurden. Das Fehlen von Monitoring-Mechanismen erschwerte zudem die Bewertung des Fortschritts. Diese Fallstudie verdeutlicht sowohl das Potenzial als auch die Grenzen globaler Initiativen zur urbanen Resilienz und unterstreicht die Notwendigkeit einer Anpassung an lokale Governance-Kontexte sowie robusterer Kontinuitätsrahmen. Gleichzeitig bedarf es eines anhaltenden politischen Engagements und klarer Rechenschaftsmechanismen, um adaptive und transformative Veränderungen zu gewährleisten.

Schlüsselwörter: *urbane Resilienz; urbane Governance; Governance-Experimentierung; 100 Resilient Cities; Resilienzinitiativen; nachhaltige Transformationen; urbane Nachhaltigkeit; Mexiko-Stadt*

Table of Contents

ACKNOWLEDGEMENTS.....	I
ABSTRACT	II
ABSTRACT (GERMAN).....	III
LIST OF ACRONYMS	VI
NOTE ON TERMINOLOGY AND TRANSLATION.....	VII
LIST OF FIGURES.....	VIII
LIST OF TABLES	VIII
CHAPTER 1. INTRODUCTION	1
1.1 RESEARCH QUESTIONS	4
1.2 RESEARCH OBJECTIVES	4
1.3 CONTRIBUTION OF THE STUDY.....	5
1.3 THESIS STRUCTURE	6
CHAPTER 2. LITERATURE REVIEW.....	7
2.1 100 RESILIENT CITIES AND DIFFERENT CASE STUDIES.....	7
2.2 100 RESILIENT CITIES AND MEXICO CITY	7
2.3 STATE OF THE ART	9
2.3.1 Globalising resilience through new models of urban governance.....	9
CHAPTER 3. METHODOLOGY.....	12
3.1 EXPERT INTERVIEW METHODOLOGY	13
3.1.1 Expert Interview Limitations.....	14
CHAPTER 4. THEORETICAL FRAMEWORK	17
4.1 RESILIENCE – AN OVERVIEW	17
4.2 RESILIENCE IN THE CONTEXT OF SOCIO-ECOLOGICAL SYSTEMS (SES)	18
4.3 CITIES AS COMPLEX ADAPTIVE SYSTEMS (CAS).....	19
4.4 URBAN RESILIENCE	20
4.5 THE IMPORTANCE OF URBAN GOVERNANCE FOR URBAN RESILIENCE	22
CHAPTER 5. URBAN CONTEXT AND RESILIENCE CHALLENGES IN MEXICO CITY.....	25
5.1 MEXICO CITY IN CONTEXT.....	25
5.1.1 Urban Expansion.....	26
5.2 URBAN RESILIENCE CHALLENGES IN MEXICO CITY	27
5.2.1 Stresses	28
5.2.2 Impacts.....	35
5.2.3 Climate Change threats.....	38
5.3 EFFORTS IN BUILDING URBAN RESILIENCE BEFORE 100RC.....	38
CHAPTER 6. URBAN RESILIENCE IN PRACTICE: UNWRAPPING 100RC IN MEXICO CITY	41
6.1 INTRODUCTION TO 100 RESILIENT CITIES	41
6.2 MEXICO CITY RESILIENCE STRATEGY.....	42
6.2.1 The 100RC Methodology.....	44
6.3 GOVERNANCE STRUCTURES AND STAKEHOLDER DYNAMICS	46
6.3.1 Mexico City's Resilience Agency and the Chief Resilience Officer (CRO).....	49
6.3.2 Global network.....	50
6.3.3 100RC Platform Partners.....	51

6.4 OUTCOMES OF THE PARTICIPATION IN 100RC.....	54
6.4.1 <i>Actions</i>	54
6.4.2 <i>Institutionalisation</i>	57
6.5 CHANGES IN POLITICS AND THE END OF 100RC	58
CHAPTER 7. INTERVIEW CONTENT ANALYSIS.....	60
7.2 CODIFYING AND SORTING INTERVIEW DATA	60
7.4 CONTENT ANALYSIS	64
7.4.1 <i>PARTICIPANT</i>	65
7.4.2 <i>CDMX UNDER 100RC</i>	67
7.4.3. <i>CDMX POST-100RC</i>	77
CHAPTER 8. RESULTS & DISCUSSION.....	85
8.1 INTRODUCTION: THE LEGACY OF 100RC IN MEXICO CITY.....	85
8.2 CONTRIBUTION TO URBAN RESILIENCE.....	86
8.3 ALIGNMENT BETWEEN THE 100RC FRAMEWORK AND LOCAL CHALLENGES	89
8.4 HOW RESILIENCE WAS UNDERSTOOD AND COMMUNICATED.....	89
8.5 GOVERNANCE INNOVATIONS AND SETBACKS.....	90
8.6 CRITICAL REFLECTIONS OF THE 100RC MODEL	91
8.7 THEORETICAL IMPLICATIONS FOR URBAN RESILIENCE GOVERNANCE.....	92
8.8 LIMITATIONS OF THIS STUDY	93
CHAPTER 9. CONCLUSION.....	96
REFERENCES	98
APPENDIX	109
APPENDIX A: INTERVIEW OVERVIEW.....	109
APPENDIX B: PLAIN LANGUAGE STATEMENT (ENGLISH TRANSLATION)	110
APPENDIX C: PLAIN LANGUAGE STATEMENT (ORIGINAL SPANISH).....	112
APPENDIX D: INTERVIEW GUIDE (ENGLISH TRANSLATION)	114
APPENDIX E: INTERVIEW GUIDE (ORIGINAL SPANISH)	116

List of Acronyms

100RC	100 Resilient Cities
AEP	Public Space Authority
AICM	International Mexico City Airport
ARCDMX	Mexico City Resilience Agency
ARISE	Private Sector Alliance for Disaster Resilient Societies
BID	Interamerican Development Bank
C40	Cities Climate Leadership Group
CAEPCCM	Mexico City Centre for Emergency and Citizen Protection
CAF	Development Bank of Latin America and the Caribbean
CDMX	Mexico City
CEMEX	Mexican Cements
CENACED	National Centre for Epidemic and Disaster Contingencies Support
CENAPRED	National Centre for Disaster Prevention
CICCDF	Federal District Inter-Institutional Climate Change Commission
CMM	Mario Molina Centre
COLMEX	Mexican Institute for Higher Education and Social Science and Humanities Investigation
COMETRAVI	Metropolitan Transportation and Roads Commission
CONAFOR	National Forestry Commission of Mexico
CONAGUA	National Water Commission
CONAPO	National Population Council
CONAVI	National Housing Commission
CONEVAL	National Council to Assess Social Development Policy
COP 21	21st Conference of Parties (2015 United Nations Climate Change Conference)
CORENA	Federal District Natural Resources Commission
CRF	City Resilience Framework
CRO	Chief Resilience Officer
CTS Embarq	Centre for Sustainable Transportation
DGR	General Directorate of Resilience
EAP	School of Public Administration
ERCDMX	Mexico City Resilience Strategy
FICEDA	Trust for Construction and Operation of Mexico City Central Supply Station
GIZ	German International Cooperation Agency
IMTA	Mexican Institute of Water Technology
INECC	National Institute of Ecology and Climate Change
INEGI	National Institute of Statistics and Geography
INFONAVIT	Institute of the National Housing Fund for Workers
IPCC	Intergovernmental Panel on Climate Change
IPN	National Polytechnical Institute
LANCIS- UNAM	National Laboratory of Sustainability Science, National Autonomous University of Mexico
OCAVAM	Organisation for Watershed Basins of the Valley of Mexico
OECD	Organisation for Economic Co-operation and Development
OM	Office of the Chief Administrative Officer
ORCDMX	Mexico City Resilience Office
PAOT	Attorney General Office for the Environment and Regional Zoning
PwC	PricewaterhouseCoopers
RBD	Rebuild By Design
RMS	Risk Management Systems
SACMEX	Mexico City Water System
SAGARPA	Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food
SECITI	Secretariat of Science, Technology and Innovation
SEDATU	Secretariat of Agrarian, Land, and Urban Development
SEDECO	
SEDEMA	

SEDEREC	Secretariat of Economic Development
SEDESA	Secretariat of the Environment
SEDESOL	Secretariat of Rural Development and Equality for Communities
SEDUFI	Secretariat of Health
SEFIN	Secretariat of Social Development
SEMARNAT	Secretariat of Urban Development and Housing
SEMOVI	Secretariat of Finance
SG	Secretariat of the Environment and Natural Resources
SGIRPC	Secretariat of Mobility
SINAPROC	Secretariat of the Interior
SOBSE	Secretariat of Comprehensive Risk Management and Civil Protection
SPC	National System of Civil Protection
SSP	Secretariat of Works and Services
STCM	Secretariat of Civil Protection
TNC	Secretariat of Citizen Security
UAM	Collective Transportation Metro System
UN	The Nature Conservancy
UNAM	Autonomous Metropolitan University
UNDRR	United Nations
WB	National Autonomous University of Mexico
ZMVM	United Nations Office for Disaster Risk Reduction
	World Bank
	Metropolitan Area of the Valley of Mexico

Note on Terminology and Translation

This thesis translates the original Spanish institutional terms into English for clarity. Specifically, the term *Secretaría* is displayed as **Secretariat**, reflecting its official designation in Mexican public administration. The term **Ministry** may be used interchangeably for variation and to facilitate reader comprehension; however, Secretariat remains the literal and preferred translation throughout the thesis.

All Secretariats named in the list of acronyms and on this thesis are Mexico City based, unless stated otherwise.

List of Figures

Figure 1: Mexico City's Resilience Efforts	40
Figure 2: Pillars, Goals, Actions, and Activities of the Mexico City Resilience Strategy	44
Figure 3: The City Resilience Framework	45
Figure 4: Structure of the Resilience Steering Committee	47
Figure 5: Creative Coding for Qualitative Analysis.	61

List Of Tables

Table 1: Institutional Stakeholders in the Mexico City Resilience Strategy, by Sector and Affiliation	48
Table 2: Code System for Qualitative Analysis.	62

CHAPTER 1. INTRODUCTION

The increasing concentration of people and its activities in urban areas have exerted pressure on the environment and the demand for services, while leaving cities vulnerable to natural disaster impacts, the pressures of climate change and socio-economic inequalities. The world population living in cities is expected to increase from 55% now to 80% by 2050 (Venditti, 2022) this, due to urbanisation as well as the shift from home residence from people in the rural to urban areas and the growth of world population (United Nations Department of Economic and Social Affairs, Population Division [UN DESA], 2019).

The cities of today are facing serious challenges to cope with stresses and shocks of climate change, geographic and socio-economic nature, and the lack of efficient urban planning can be a risk driver for disasters. The UN calls for the need to make cities and human settlements inclusive, safe, resilient and sustainable, as one of their Sustainable Development Goals dictates (11) (United Nations Human Settlement Programme [UN-Habitat], 2022).

Cities are considered more and more critical sites that play a central role in addressing challenges related to sustainability. Thanks to the cities' nodes of governance networks, resource flows and physical spaces (Revi et al., 2014), they can address the issues of urban sustainability and development.

Naturally, in recent years the role of urban resilience and finding ways to manage hazards and urban development have attracted significant attention bringing a number of efforts and initiatives in place, globally. With it, new approaches to urban governance in the form of global projects designed by private philanthropic foundations have gained traction, such is the case of resilient cities initiatives as a prime strategy for sustainable development. It is contested however, to what degree these initiatives have and continue to impact resilient transitions in cities. While these urban resilience initiatives are recognised for incentivising transformational change, they are also criticised for prioritising private sector agendas and eroding the responsibilities of the public sector (Fastenrath et al., 2019b).

One of these actions is the 100 Resilient Cities (100RC) initiative created by the Rockefeller Foundation in 2013, with the aim of supporting cities globally to become more resilient to physical, economic and social shocks. The Rockefeller Foundation and the later Resilient Cities Network (n.d., para: 1) define urban resilience as: the “capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience”.

The initiative involved providing funds to the selected cities to appoint a Resilient Chief Officer, develop a resilience strategy according to each city’s particular risks and hazards, and access and share knowledge on ideas and innovation through a global network. Resilience strategies cover a wide range of topics including disaster management, health and wellbeing, infrastructure, water and wastewater management, housing, employment, inequality, and youth planning (Fu et al., 2023). Of the 1,000 cities applying, 100 cities were chosen to be part of this network, making up together more than a fifth of the global urban population (The Rockefeller Foundation, n.d.-a). In 2019, the initiative formally closed, leading to the withdrawal of financial and institutional support from the Rockefeller Foundation to the cities. Some efforts continued through what later became the Resilient Cities Network (R-Cities), maintaining its global network and knowledge-sharing functions, but without the same level of resources or direct financial support.

After a selection process, Mexico City (CDMX, from its abbreviation in Spanish), became part of 100RC in 2013. CDMX is confronted with a number of resilience challenges; once a lake, the now second most densely populated city in the Americas and the 6th most populated metropolitan area in the world, the megacity has gone through rapid urban expansion, population growth and inadequate long-term planning. With this, the city encounters diverse risks. Besides frequent impacts of hydrometeorological origin, the city has experienced the greatest economic and human losses due to geological phenomena; moreover, the urban area is significantly challenged by chronic stresses such as aquifer overexploitation which is greatly affecting water supply and seismic vulnerability, in addition to social and economic inequality and disparities in public space use (Agencia de Resiliencia de la Ciudad de México [ARCDMX], 2016). Of equal importance, climate change could potentially intensify hydrometeorological events resulting in heat waves, intense rainfall and prolonged droughts.

Four years after the CDMX’s participation in the initiative, the city published its Resilience Strategy accordingly, which aimed at implementing actions in the areas of regional cooperation, water

management, urban and regional resilience, mobility and adaptive innovation and capacity; as well as aiming at implementing an inclusive process where diverse vulnerable actors and groups would take part in (ARCDMX, 2016). In 2019, the 100RC initiative ended, cutting funds for....

While CDMX holds a history of efforts to build resilience and reinforcing civil protection since the last century, especially after the 1985 earthquake, becoming part of such a global initiative, unique in its kind, has no precedents. The programme proposed a new governance method in which instead of a top-down approach, participation is meant to occur on a multilevel basis and beyond the traditional means of authority and problem solving. Furthermore, the Resilience Strategy that resulted and which aligned to the 100RC Framework, proposed the implementation of actions and strategies to expanded areas, including and beyond disaster response.

The debate remains, though, regarding the impact and degree of success of the strategies designed and the governance model proposed by 100RC. For instance, some literature suggests that Mexico City's strategies have proven unsuccessful in terms of urban and regional planning as well as erroneously focused on disaster response and mitigation measures rather than reducing disaster risk (Alcántara-Ayala et al., 2022), especially after the disastrous earthquake on September 19, 2017. On the other hand, the incorporation of the term *resilience* in Mexico City's Political Constitution in 2017 is considered a major milestone for the institutionalisation of resilience which is attributed to the city's participation in the program (Interviewee 2).

After 10 years since Mexico City joined 100RC, exploring the legacy of one of the first and most important global efforts to help cities become resilient arises as a subject of interest. Where the proposed resilience actions stand or how the vision on urban resilience has evolved in Mexico City during the time are some of the queries one can think of. On this note, the complexity of the cities increasingly evident in big metropolitan areas that continue to expand, such as Mexico City and Latin America, need to be acknowledged and need tailored and adapted lines of action. As such, another point for debate and more generally speaking, is if the 100 Resilience Framework effectively addressed each city's particular needs, or if it provided the necessary tools to measure progress and impact, or if the opportunity to join a global network contributed effectively to the construction of urban resilience. Similarly, if the initiative effectively transmitted a new urban governance approach, and how we can measure its success.

1.1 Research Questions

Main Question:

What is the legacy of the 100 Resilient Cities initiative in Mexico City, and to what extent has it contributed to shaping urban resilience governance and transformative change over the past decade?

Sub-questions:

- How has urban resilience been understood and translated into Mexico City's policy and practice following 100RC?
- How did participation in 100RC influence resilience building efforts and local governance practices in CDMX?
- Did the 100RC Resilience Framework address the city's specific challenges?
- To what extent did the initiative enable adaptive and transformational change, and what gaps emerged between discourse and practical implementation?

1.2 Research Objectives

Using urban resilience and urban governance approaches, the overall purpose of this study is to explore whether urban resilience initiatives and strategies, such as 100RC, bring adaptive and transformational change, by analysing the implementation process and the results of resilience actions in the case of Mexico City.

The research intends to understand how 100RC contributed to building resilience in Mexico City, how the city's view of urban resilience evolved and was institutionalised, as well as if it led to new thinking and paved the way for further efforts. Similarly, the study seeks to explore Mexico City's resilience journey after joining 100 Resilient Cities, by mapping out resilience actions linked to the Strategy and any programs catalysed by the initiative.

Based on theoretical references, the project supports the view of cities as complex socio-ecological systems that should have adaptive and transformative capacity in order to achieve resilience. Hence, the research also seeks to discover how resilience is understood in the context of 100RC.

1.3 Contribution of the study

Building upon the gap of knowledge on how resilient initiatives are implemented in practice, as will be noted in the literature review in the following chapter, this study adds the Mexico City case to the existing body of literature, a case which has not been explored before in this perspective nor with the methodology tools employed. Covering a timeline of ten years, the study focuses on the legacy of CDMX's involvement with 100RC, a timeframe that enables an in-depth look at what remains of the original Resilience Strategy and its long-term impacts, including the creation of the Resilience Agency and various urban resilience efforts supported by Rockefeller Foundation resources. While the documentation of actions resulting from the Strategy is one of the analysis' objectives, the overall purpose of this investigation is not to study a particular activity nor a priority area (water, mobility, intersectoral cooperation, etc.), although it hopes to pave the way for further and specific studies in the Mexico City case, based on, for instance, particular actions, a particular sector, or detailed governance structures, to name a few possibilities. In this sense, the study seeks to depict a big picture into the city's journey throughout 100RC and serves as an additional case study for the implementation of new models of urban governance and globalising resilience.

Referencing the very valid critique about “one size fits all” (Martín & McTarnaghan; Galderisi et al., 2020), the study on the CDMX case can potentially confirm or disprove other scholars' point of view on resilience initiatives and the new governance model they propose. This research explores whether key findings in existing studies apply to Mexico City, using primary and secondary sources including data from interviews with experts directly involved in the design and implementation of the Resilience Strategy.

Additionally, this study aims to inspire future research by identifying gaps in our understanding of regional coordination, the progress of resilience building, and the interplay between 100RC's goals and local contexts. By linking CDMX's experience under 100RC with broader critiques of “globalising or neoliberalising resilience”, this paper aligns with Davidson and others' (2019) call for rigorous, empirically grounded case studies.

Finally, this study offers insight into the role of philanthropic organisations like the Rockefeller Foundation in shaping governance through city networking. By shedding light on CDMX's experience, this paper aims to contribute both a specific understanding of urban resilience in the city and a broader perspective on how these new governance models are reshaping urban policy

and action worldwide. And very importantly, the study can potentially serve useful for future policy implementations, from both a global, national, and regional perspective.

1.3 Thesis Structure

This thesis is organised into 9 chapters. Following this introduction, chapter 2 reviews relevant literature, focussing on the application of 100 Resilient Cities in different case studies including Mexico City. It also examines urban governance and presents the State of the Art in studies on urban governance initiatives. Chapter 3 details the methodology, including data collection and analysis methods, followed by chapter 4 which outlines the theoretical framework that supports the current study. With chapter 5 the document analysis begins, providing an overview of the context of our case study, including aspects around urban resilience. Chapter 6 unwraps the 100RC initiative implementation in Mexico City, touching upon the governance model implemented in practice and outcomes. The empirical analysis of the interview data starts with Chapter 7, which presents the findings of the interviews conducted for this study. Chapter 8 integrates and compares the analysis of the collected data from the document and interview analysis in the shape of key findings and discussion. The final chapter concludes with a reflection on the significance of results and suggests future research contributions. Starting chapter 4, a short introduction to each the section is provided.

CHAPTER 2. LITERATURE REVIEW

2.1 100 Resilient Cities and different case studies

The body of literature draws attention to the developing landscape of urban resilience governance, which emphasises the need for innovative approaches, systemic thinking and empirical investigations to manage current cities' challenges.

Fastenrath et al. (2020) highlight the inadequacy of traditional urban policy and planning approaches in addressing current resilience issues. They advocate for “governance experiments” as platforms for testing new collaborative and innovative approaches, emphasising the need for active stakeholder engagement and a willingness to learn from failure, as demonstrated in their study on Resilience Melbourne. Similarly, investigating the governance practices shaping resilient cities, Huizenga et al. (2023) advocate for an empirical approach to resilience. With the Rotterdam case and based on the governance techniques used, they reveal the potential dual nature of resilience discourse as progressive and oppressive. Also using Rotterdam as a case study to show how the initiative promotes resilience through interdisciplinary and cross-sectoral strategies, Spaans & Waterhout (2017) argue that resilience requires cities to develop systemic capacities to address complexity, and to develop the abilities to learn, adapt and transform across sectors and levels.

Galderisi et al. (2020) shed light on the key advantages and disadvantages of the resilience-building techniques used by Rome and Athens under 100RC, and how the resulting strategies enhance the cities' ability to cope with urban challenges. Other diverse scholars expose the challenges of the implementation of the new global model of resilience that 100RC offers and the resulting resilience strategies on different cities. Issues of monitoring, continuation, or political turnover appear to be significant factors to determine the effects of 100RC and the resulting strategies in Rome, Athens (Galderisi et al. 2020), as well as some cities in the US (Fastiggi et al., 2021) and Colombia (Naef, 2022).

2.2 100 Resilient Cities and Mexico City

Specific to Mexico City, there are ongoing efforts to understand and address the complexities of urban resilience in Mexico City within 100 Resilient Cities. These efforts have provided key insights in terms of the conceptual understanding of resilience, the need for empirical analysis,

policy implementation challenges, evaluation frameworks and the need for capacity building and transformation (Rodríguez-Izquierdo et al., 2022; Torres-Lima et al., 2020). Moreover, some authors have provided key critical insights on the contribution of the initiative in the city, this, through the Mexico City Resilience Strategy (ERCDMX), pointing out its weaknesses and failures once implemented (Rodríguez-Izquierdo et al., 2022; Alcántara-Ayala et al., 2022).

One of the major difficulties in implementing resilience strategies in urban planning relies on bridging the gap between theoretical concepts and practical applications due to the complex nature of urban systems and governance issues. Rodríguez-Izquierdo et al. (2022) suggest that the ERCDMX's actions did not fairly contribute to the resilience attributes provided by 100RC, showing disparities on how they were presented. Moreover, it is claimed that initiatives like 100RC use resilience features without minding how these attributes are presented in public policies, proving ineffective action by the government for urban resilience. By showing disparities between conceptualisation and actions, there is a need to develop systematic evaluation frameworks for the design of resilience strategies (Rodríguez-Izquierdo et al., 2022).

Alcántara-Ayala et al. (2022) strongly suggest that there is a need for empirical studies to understand the real-world implications of resilience strategies instead of relying on official reports. Focussing on the Strategy, they suggest that Mexico City's proposed actions have proven unsuccessful in terms of urban and regional planning as well as erroneously focused on disaster response and mitigation measures rather than reducing disaster risk, especially after the disastrous earthquake on September 19, 2017 (shortly after the publication of the Strategy).

After identifying the lack of an evaluation framework to measure the actions from the Mexico City Resilience Strategy and designing indicators for two actions¹ of the document, Torres-Lima et al. (2020), have noted that the city needs to build the capacities of adaptive and transformative capacity within urban systems in order to face its resilience challenges. For the ERCDMX and for future development of actions, strategies should not focus on immediate response but on building long-term socio environmental trajectories and transformation capacities (Torres-Lima et al., 2020).

¹ Installation of rainwater harvesting systems and extension of the Ecobici system.

2.3 State of the Art

The literature on the 100 Resilient Cities initiative involves numerous studies examining its effects in specific urban contexts and focusing on the governance approach it promotes. Scholars have explored the implementation of 100RC in individual cities, analysing its impact on governance and resilience, including case studies, including Mexico City, providing detailed insights. In addition, several researchers have contributed to a broader critique of resilience initiatives, highlighting the implications of the governance models like 100RC and questioning the scalability and adaptability of these approaches to diverse urban contexts.

This section will review the latest and most significant developments in this body of literature, reflecting the current state of research and practice in urban resilience. The review also aims to identify gaps and opportunities where this thesis can make a meaningful contribution. Overall, this research demonstrates a growing recognition of the complexity of the challenges faced by cities globally and reveals a dynamic landscape of urban resilience governance that is evolving to address multifaceted issues.

2.3.1 Globalising resilience through new models of urban governance

The new models of urban governance go beyond traditional governance structures, aiming for flexibility, inclusivity and adaptability to build cities that are resilient to shocks and stresses. An increasing body of literature studies and puts these new approaches under a critical lens, referencing the increasing number of international private initiatives usually pushed forward by nonprofit organisations. The wave of emerging channels of global governance, which are usually linked to “experimentalist governance”, “networked urban governance”, or “adaptive governance” (Sabel & Zeitlin, 2011; Nguyen & Davidson, 2023; Pitidis & Coaffee, 2020), amongst others, has served as both a cause and a consequence for global actors to promote joint global efforts to help cities become resilient in an era of increasing risks and disasters. In a way, this has enabled these actors to dominate the global discourse on urban resilience.

The resulting landscape of new models of urban governance for resilience faces significant criticism from various scholars, accusing initiatives like 100 Resilient Cities of taking these channels as an opportunity to promote a neoliberal agenda, and proposing market-based solutions to resilience challenges as a critical step (Leitner et al., 2018). Given its governance approach, practices and aspirations, 100RC has been linked to philanthrocapitalism or platform

capitalism² (Webber et al., 2020; Zebrowski, 2020; Montero, 2020), also naturally leading to be subject of contestation.

While 100RC has been recognised as an innovative governance model in promoting resilience globally, aiming for collaborative solutions (Zebrowski, 2020), fostering collaboration among diverse stakeholders and encouraging intersectoral thinking and innovation (Fastenrath & Coenen, 2021), there have been gaps identified by several scholars based on case studies, giving a closer look to how resilience strategies are implemented in practice in different cities, such as Jakarta, Melbourne, Cali, Chicago, New Orleans, and more (Leitner et al., 2018; Fastenrath et al., 2019b; Naef, 2022; Tierney, 2015; Fitzgibbons & Mitchell, 2019).

100 Resilient Cities promotes itself as an inclusive programme, with the aim—in theory—of giving voice to non-traditional sectors of the population to be involved in the decision-making process for enhancing resilience in cities. However, based on practical cases, this neoliberal framing of resilience has been accused of prioritising the private agenda and their technical assessments, while neglecting system inequalities, marginalising vulnerable populations and promoting top-down decision making (Leitner et al., 2018; Tierney, 2015). Moreover, it has been pointed out that the programme has shown some inconsistencies in social equity and justice within, as well as threats to marginalised communities (Fitzgibbons & Mitchell, 2019).

The body of contestation towards 100RC in terms of its capitalistic practices i.e. efforts to commodify urban resilience which are aimed at generating dividends for private-sector companies and investors, attracts attention to the overly pushed need for connectivity encouraged by the programme. As Zebrowski (2020) claims, 100RC's promotion of connectivity as the main problem and main solution to urban resilience challenges often ignores broader social impacts and instead reinforces neoliberal frameworks. This invites us to ask ourselves, for instance, which forms of knowledge are prioritised, who benefits from resilience investments, and which types of connectivity are considered beneficial or problematic.

Several researchers have also contributed to the understanding of how cities are implementing resilience, by exploring power dynamics and the process of governance in practice derived from the implementation of 100RC, providing useful calls-to-action for the novel approach. Exploring

² In reference to the Platform Partners promoted by the programme.

the implications of networked governance, Davidson et al. (2019) have emphasised the importance of dialogue across different knowledge systems to help bridge gaps between different stakeholders. Based on Resilient Melbourne, Fastenrath et al. (2019b) have enriched the debate by advocating for new analytical frameworks and for the understanding of governance process, power dynamics and political contexts to achieve real transformation in urban resilience. It has also been highlighted the need for a better integration and evaluation of urban resilience strategies with global development policies (Croese et al., 2020), as well as an urge to stop prioritising conventional issues like climate change over issues of inequality and violence, like 100RC does through its “flexible” definition of resilience (Naef, 2022).

CHAPTER 3. METHODOLOGY

The research was conducted based on literature review and document analysis which includes but is not limited to: Mexico City's Resilience Strategy, government decrees, official reports (i.e. "Resilient City: Retrospective and Projection of an (In) Vulnerable City" by the SGIRPC³), official reports on relevant resilient projects, studies (i.e. "Theoretical Framework for Identifying Initiatives to Increase the Seismic Resilience of a City" by CDMX and Bain & Company), government reports, as well as official gazettes outlining the formations of relevant government agencies and its explicit roles linked to building resilience. Additionally, the research was supported by the analysis of four qualitative semi-structured interviews to relevant actors who were involved in the participation of Mexico City in 100RC. The purpose of the interviews is to understand how the initiative and resulting Strategy have impacted the city's resilience transition by exploring the achievements, actions, opportunities and challenges, as well as the governance process that took place.

The literature review and theoretical framework for this thesis was conducted using a systematic approach to ensure a comprehensive and relevant selection of academic sources. The primary databases consulted were SCOPUS and research tools from the University of Vienna, both which provide access to peer-reviewed journal articles, academic publications, and books. The search was narrowed down to scholarly works published in both English and Spanish, given the case study i.e. Mexico City. The selection process involved the use of targeted keywords, including but not limited to "*urban resilience*", "*urban governance*", "*resilience*", "*100 Resilient Cities*", "*urban resilience initiatives*", "*sustainable cities*", "*Mexico City and 100 Resilient Cities*", "*experimental governance*", "*complex adaptive systems*", "*socio-ecological systems*", "*philanthrocapitalism*", among others. Boolean operators (e.g. AND, OR), were applied to refine the search, and articles were screened based on their abstracts and keywords. For the literature review and state-of-the-art, priority was given to recent publications (from the last 10 years) to ensure up-to-date insights, and for the theoretical framework, seminal works from the 1970s onwards were consulted.

All sources were cited and referenced in accordance with the Publication Manual of the American Psychological Association 7th edition (APA 7). Reference management formatting was supported using the programme Zotero. All automatically generated references were reviewed manually to ensure accuracy and adherence to APA 7 guidelines.

³ Secretariat of Comprehensive Risk Management and Civil Protection

3.1 Expert Interview Methodology

As a second part of the study, this thesis employs a qualitative data collection method in the form of semi-structured expert interviews. By providing first-hand information, expert interviews provide in-depth understanding, nuanced data and perspectives on social phenomena (Bogner & Menz, 2009). As such, they enhance the credibility of the research outcomes, challenge existing theories and their insights can lead to further exploration in the subject matter.

A total of four interviews were conducted between September and November of 2023 with participants consisting of experts who were involved in the participation of Mexico City in 100 Resilient Cities; in the design and/or implementation of Mexico City's Resilience Strategy, and/or participated in the Resilience Agency, and who are still involved in building resilience in the city. These experts come from diverse organisations including government, Academia and/or civil society, and from multiple backgrounds related to sustainable development and urban planning. They were all located in Mexico City and were contacted through online platforms and email (Appendix A: Interview overview). A Plain Language Statement or information sheet was provided to the participants beforehand, detailing the research project's objective, how their participation contributes to the study, and what is asked from them in the interview, amongst other details (Appendix B: Plain Language Statement English translation; Appendix C: Plain Language Statement original Spanish). Once agreed, a date and time was agreed upon with the participants to conduct the interview.

The identity of the participants was anonymised to ensure the compilation of unbiased information, and to gather as much accurate and truthful data as possible. By protecting the privacy and confidentiality of the participants, they could feel comfortable enough to speak more freely and provide as many insights as possible, hence promoting a more objective and impartial analysis. All interviews are referred to in this thesis as Interview 1, Interview 2, etc., to ensure confidentiality.

The questions of the interview, directly linked to the research questions of the study, aimed to explore the participant's role during Mexico City in 100 Resilient Cities, how urban resilience is understood as an outcome of 100RC and to understand how the initiative and resulting strategy have impacted the city's resilient transition by examining successes, opportunities and challenges, and the governance process that took place.

The interviews were conducted in Spanish, and followed a semi-structured format, with the main questions predetermined but with room for additional questions to clarify or deepen the answers or certain aspects. The questionnaire was divided into three sections and consisted of 5 questions with additional sub-questions. The three sections were divided into: *Participant*, setting a focal point on the interviewee and her/his vision on urban resilience as they participated directly in the initiative; *CDMX under 100RC*, covering the period from 2013 to 2019, and; *CDMX post-100RC*, covering the period from the closing of the initiative in 2019 until the present day (2023) (Appendix D: Interview Guide English Translation; Appendix E: Interview Guide original Spanish). The Interview Guide with this questionnaire was shared with the participants beforehand.

The interviews took approximately 60 minutes each and were conducted in Spanish (native language of both the participant and the interviewer) for a more effective communication, accuracy of data, and awareness of cultural nuances, thus enhancing the quality, depth and validity of the research findings. The dialogues were recorded, transcribed and reviewed, and consequently shared a copy to the interviewee for its review. Once reviewed, the interview transcriptions were translated into English and reviewed once again.

In terms of the interview setting and programs employed, the meetings took place online using video call software program Zoom which was utilised for video and recording. The transcription of the interviews was aided by research tool Pinpoint. Lastly, the data analysis was assisted by the software program MAXQDA.

As noted previously, the interviews conducted for this research were transcribed for analysis. The interviews are summarised and analysed in Chapter 7, while the full transcripts serve as supporting material previously reviewed by this thesis' supervisor. As they are not required for assessment, and in line with faculty guidance and the recommendations of the supervisor, the full interview transcripts are not included in the appendix of this thesis. The transcripts were used solely for data analysis and are available from the author upon request.

3.1.1 Expert Interview Limitations

While the primary data collected during the expert interviews provided invaluable insights and constituted an essential part of the research findings, it is worth mentioning the limitations of this methodology as well as the limitations encountered throughout this stage.

Primary limitations of this type of methodology are associated with the subjectivity of interviewing a small number of individuals. As experts in the field, their insights are commonly accepted and can effectively address aspects of public policy and urban resilience. This methodology differs from non-expert interviews with a larger sample size, in which a usually a general survey is conducted, and in which the findings can be generalised to a broader population.

Hence, in this case, the sample size of four experts limits the ability to generalise these findings to a larger population. The interviewees belong to a certain sector of the population that is experienced in the field of urban resilience, with a relevant background for the case study, and directly linked and familiarised with Mexico City in 100 Resilient Cities. The way in which urban resilience, or just resilience even, is understood by them could differ greatly from non-experts. For example, when we make conclusions related to *“how we think the perspective of urban resilience has changed or evolved from CDMX’s participation until now”*, it is important to note that this vision does not necessarily apply to the broad population. The same can be said about the effect of 100RC as an initiative, where the perceived impact and meaning may vary between a pool of experts and the broader population.

Another challenge during this stage was locating and identifying candidates directly associated with CDMX’s and 100RC. Potential participants were dispersed, particularly due to the dissolution or restructuring of relevant institutions. Moreover, geographical locations and time differences (Austria vs Mexico), often hindered arranging meetings. Candidates were reached out through different online channels and several times there was no response received which, coupled with time limits and geographical differences, resulted in utilising a smaller sample.

The process of approaching participants and gathering data consisted of a formal process; some documentation prior to the interview was shared, interviews were conducted using video and recording devices, and the dialogue was later transcribed. While the participant’s identity was anonymised in an effort to establish rapport and be able to retrieve more data, it does not entirely prevent interviewees from restraining themselves or holding back certain details given the positions they may hold. The possibility of this affecting the data collected and research findings at a certain degree should not be discarded.

Having pointed out the limitations however, conducting expert interviews proved significantly satisfactory for this research. Not only did these experts participate directly in the subject matter i.e. CDMX in 100RC, but the sample was carefully and purposely selected to gain different views. For instance, the participants held different roles during the time of the city's annexation to the program, and, while they belong to related fields, their fields of expertise differ. Moreover, experts are now exercising in different sectors like Academia, government and private sector. As such, besides providing sufficient information for the research, the expert sample offered a fairly broad spectrum with different perspectives, enriching the study findings.

CHAPTER 4. THEORETICAL FRAMEWORK

This chapter explores the theoretical foundations for understanding resilience in urban contexts. It begins with an overview of resilience and its conceptual development, to later provide the importance of viewing cities as Socio-Ecological Systems (SES) and as Complex Adaptive Systems (CAS). The discussion then narrows down to the concept of urban resilience as a response to current global challenges, further focussing on the role of urban governance in fostering resilience capacities in urban contexts. Finally, the chapter addresses the need for urban governance initiatives for resilience which naturally links with our case study and 100RC.

4.1 Resilience – an overview

Given the increasing applications across a number of fields and focus areas, the term “resilience” cannot be given one single definition. The concept has a long history and it has evolved over time; it would be fair to acknowledge the first use of the term in the 1400s as a juridical expression that meant the termination of a contract and the reinstatement of the original legal situation (Gößling-Reisemann et al., 2018). However, resilience was afterwards more commonly used in the field of physics/engineering, which understood it as the ability to “bounce back” or “recover and return to the original state” (Klein et al., 2003, p. 35); and in the field of psychology, which links resilience with positive outcomes from situations of high risk or stress, and defines it as “positive adaptation despite experiences of significant adversity or trauma” (Luthar & Cicchetti, 2000, p. 858).

The original concept of resilience according to modern resilience theory was introduced by Holling when he defined—ecological—resilience as the “measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables” (Holling, 1973, p. 14). In this sense, Holling’s approach suggests that a resilience system is the one which, after disturbance, “persists” and continues functioning, not necessarily going back to its original state. This differentiates with engineering resilience, which implies a single state of equilibrium and aims for a return to the original state (Holling, 1996).

Taking into account the definitions of resilience in engineering, psychology and ecology, we can find some key concepts or common characteristics of resilience, such as adaptability, robustness, recovery, redundancy (Kong et al., 2022), and others.

4.2 Resilience in the context of socio-ecological systems (SES)

The technical use of resilience in some fields refers to the return rate to equilibrium after a disturbance. However, there exists some limitations in accounting for changes in the nature of systems over time (Scheffer, 2009). Contrary to the ideal of ecosystems being pristine, Berkes et al. (2002) conceived the term socio-ecological systems (SES), recognising that human activities have strongly influenced most ecosystems. In this sense, besides recognising ecological thresholds, the social dimension is incorporated.

In these systems, nature and society are legitimately interdependent (Folke et al., 2005). Human actions are often considered external drivers, and the endogenous and exogenous processes affect the interaction between humans and their ecosystem. Ecosystems don't develop towards a singular stable state, but experience periods of change (Martin Breen & Anderies, 2011; Folke et al., 2005). Assuming the opposite can lead to negative outcomes by practitioners with the aim of reaching resilience or sustainability.

The dynamics of SES are greatly influenced by feedback loops that are a result of this interconnectedness between nature and society. Understanding the feedback loops, the ecosystem boundaries, and the attributes of a social system—such as governance structures, networks, institutions, etc. —is necessary to assess social-ecological resilience.

In this sense, Folke and others (2010) emphasised the need for broader concepts to understand the dynamics of intertwined social-ecological systems; as such, they proposed *adaptability* and *transformability* as prerequisites for socio-ecological resilience. In an SES, adaptability is the shared ability of human actors within a system to effectively manage resilience (Walker et al., 2003). SES resilience not only means having the adaptive capacity to adjust the responses to maintaining certain functions after a system was disturbed—and capacity which may as well be constrained by identity or core values—but also having a transformative capacity in which the system can recover and return to an alternative state, when its original state was unsustainable.

SES, or cities, are continuously changing and evolving; going back to the original or prior state could mean disrupting normal or going back to a vulnerable state, hence cities need to have adaptive and transformative capacity. Acknowledging that cities are—complex—socio ecological systems and understanding SES dynamics is essential to address the risks that result from the current growing urbanisation.

4.3 Cities as Complex Adaptive Systems (CAS)

Before we can speak of Urban Resilience, it is imperative to specify the resilience *of what*; in this sense, we first ought to define what is meant by urban, what we understand by cities and how we view cities. Not only are cities socio-ecological systems, as described above, but cities are increasingly recognised as Complex Adaptive Systems (CAS), in which complexity, non-linearity and adaptability are their inherent characteristics and which dynamics are shaped by the interaction of various elements (Shi et al., 2021). According to CAS theory, cities are not static entities, but dynamic, self-organising systems characterised by feedback loops, emergence and the stability to adapt to changing conditions (Holland, 1995).

Cities' complexity relies on the interaction and integration of various components that the city consists of, including physical infrastructure, ecology, and social and economic systems. At the same time, cities have the inherent feature of adaptability when responding to changes, for instance, in demographics, technology, or economic conditions. An urban system is in constant state of evolution and development, and it can demonstrate its capacity for self-organisation and adaptation to external influences. Over time, the components of a system, or a city, must evolve to enhance the capacity for survival in interactions with the surrounding elements; the ability of the parts to adapt or learn is the essential characteristic of complex adaptive systems (Holland, 1992).

It is crucial to view cities as complex adaptive socio-ecological systems, in which social, economic, and ecological elements are interdependent, and where intricate interactions and feedback loops shape their development. Understanding urban systems in this context should be accounted for effective management and governance strategies, and crucial for fostering sustainability and resilience. A strategy to increase urban resilience should not only focus on the resilience of individual components but also on interactions (Castillo-Villanueva & Velázquez-Torres, 2015, 29). Furthermore, recognising and embracing the complexity of cities can lead to more resilient and adaptive approaches to urban development.

The CAS approach also raises the need to determine which parts should continue to operate in the face of potential failure, with this, questions of “resilience of what? and resilience to what?” arise (Martin-Breen & Anderies, 2011), to identify which element of the urban system for which resilience should be addressed and which particular challenges or risks an element is resilient to.

4.4 Urban Resilience

The world population living in cities is expected to increase from 55% now, to 80% by 2050 (Venditti, 2022). This, due to urbanisation as well as the shift from home residence from people in the rural to urban areas and the growth of world population (UN DESA, 2019). While cities only cover 2 percent of the world's land surface, their activities consume over 75 percent of the planet's natural resources (Venditti, 2022). The increasing concentration of people and its activities in urban areas have exerted pressure on the environment and the demand for services, while leaving cities vulnerable to natural disaster impacts, the pressures of climate change and socio-economic inequalities.

Naturally, urban resilience research has gained significant attraction, and consequently, designing strategies to build urban resilience seems the adequate answer as the cities of today are facing serious challenges to cope with stresses and shocks. In 2002, the International Council for Local Environmental Initiatives (ICLEI), introduced the concept of “resilient cities” as part of urban and disaster prevention research, thereby elevating the focus on research into urban resilience. Moreover, the UN calls for the need to make cities and human settlements inclusive, safe, resilient and sustainable, as one of their Sustainable Development Goals dictates (11) (UN, 2022).

But what do we mean by urban resilience?

Giving a single definition to urban resilience is a challenging task, especially given the evolution of the concept over time. Traditionally, urban resilience has been linked to disasters or impacts only. Godschalk (2003, p. 2) suggests, for instance, that “a resilient city is a sustainable network of physical systems and communities”. As the concept has evolved and it has been applied to an increasing number of fields, the conceptualisation has gone beyond disasters and has taken into account cities' chronic tensions. These persistent challenges of structural, social, economic or environmental nature, are certainly a result of the complex interaction between several components of the urban system.

A review of the literature on urban resilience of over a 41-year period shows that half of the definitions are situated within the context of a particular threat (for instance, climate change), whereas the remaining half centre around the capacity of an urban system to address all risks (Meerow et al., 2016) and aim to enhance the functions of the system services (Kong et al., 2022).

Just like the concept of resilience, urban resilience exhibits conceptual variations and can be interpreted within diverse disciplines. This can create some difficulty to both comprehend the concept and to operationalise urban intervention measures. On the other hand, this multitude of disciplinary perspectives can help broaden resilience lines of action and extend the focus not solely on impacts but on chronic tension of ecological and socio-economic nature as well as climate change driven.

With the challenges posed by the augmentation of population, rapid urbanisation, climate change and globalisation, the primary focus of urban resilience is to enhance cities' capacities in addressing diverse natural disasters, pressures of climate change and socio-economic risks. As such, resilient cities are critical sites and play a central role in addressing challenges related to sustainability. Thanks to the cities' nodes of governance networks, resource flows and physical spaces (Revi et al., 2014), they can address the issues of urban sustainability and development, making them perfect places for policy development.

Building a resilient city should mean building the capacities for cities—and its elements, both physical and socio-ecological—to implement measures before, during and after disastrous events to mitigate adverse impacts (Kong et al., 2022), as well as building capacities to absorb disturbance, adapt to change, maintain or return back *swiftly* to its normal functions, alternatively, transform in case the normal conditions were not ideal or limit the present or future adaptive capacity of the city (Meerow et al., 2016).

In their aim of supporting cities to become resilient and put resilient strategies into practice, the Rockefeller Foundation and the later Resilient Cities Network (n.d., para: 1) defined urban resilience as follows:

“The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience”.

The link to Sustainability

Urban resilience indeed contributes to and interconnects with sustainability in socio-ecological systems. One should not try to think about resilience without thinking of sustainability. There may be some debate in terms of the actions that may need to be taken to become resilient to shocks

and stresses (whether it's environmental, natural disaster, social or economic related), which could eventually lead to a threat to sustainability. However, the objective should then be taking steps that will not threaten sustainability in the first place. If we take actions to become resilient which will in the long run threaten sustainability, we are in fact not making systems resilient. As in a vicious circle, urban systems' capacities of recovery, adaptedness and transformation—necessary to achieve resilience—may be threatened as well.

4.5 The importance of Urban Governance for Urban Resilience

Urban governance involves interactions among various stakeholders, including government authorities, non-governmental organisations, community groups, and private entities, in shaping the development and functioning of cities.

Initiatives aimed at helping cities become resilient or improving resilience actions undoubtedly encounter issues of governance. Questions arise in terms of who decides what aspects should be enhanced for resilience, for whom resilience is intended to be managed and for what purpose. Similarly, aspects such as the decision-making process, power structures, policy frameworks and regulations, and monitoring and evaluation, are to be considered when talking about governance for resilience strategies. Governance is a crucial factor that contributes to the effectiveness of other drivers of change in urban development and sustainable urbanisation (UN-Habitat, 2019, 2020).

As for many other arenas, governance is a key process for the implementation of sustainable development initiatives for urban development. As recommended by UN-Habitat (2023, p. 1), a good governance process should be “participatory, consensus oriented, accountable, transparent, responsive, effective, efficient, equitable and inclusive”. Furthermore, just as with resilience, good governance should involve adaptive capacity (Dietz et al., 2004), in the sense that it should be able to respond swiftly to emerging challenges, allow repetitive learning, enable the adjustment of strategies based on the changing circumstances derived from complex interactions in SES.

Within the aim of establishing sustainable and inclusive cities, the New Urban Agenda and the Sustainable Development Goals put forward the role of multi-level territorial governance (United Nations, 2017; Organisation for Economic Co-operation and Development, 2020; UN-Habitat,

2020), emphasising the collaboration between several levels of the government, between sectors, as well as the participation of all citizens, namely academia, government and civil society.

The construction of a resilient city hence requires systematised actions that can be implemented over time, reaching goals and adding actors to the process that can get involved in the participative construction of solutions aimed at fighting the most urgent issues such as: climate change, availability of water, energy and food, public services, mobility, ecosystem degradation, lack of urban planning, and others.

4.5.1 Resilience initiatives and new ways of urban governance needed

Departing from the idea that mainstream forms of governance do not sufficiently address the challenges brought by climate change and rapid urbanisation, mainstream policy has been put into question. A growing number of researchers acknowledge that top-down or conventional governance processes—which can imply high levels of bureaucracy, unequal distribution of power, creation of boundaries, and others (Cumming et al., 2006) hardly address the scale of ecological complexity and don't necessarily deliver successful solutions (Chaffin et al., 2014).

Likewise, Folke et al. (2005), state that novel approaches of governance are required to guide management towards sustainability due to the characteristic positive feedback of SES and the interactions across scales. In this sense, strategies towards resilience also need to be context-dependent (Walker et al., 2003), hence the importance of understanding cities as complex systems which experience unavoidable changes.

As such, bottom-up approaches to governance have emerged and put into practice in recent years, especially for the areas of sustainability and climate action. One of these approaches is “experimental governance”, in which the policy implementation involves rather experimentation and continuous learning, using more flexible, adaptive and innovative approaches (Sabel & Zeitlin, 2011) and upscaling best practices, as opposed to static top-down approaches.

Resilience initiatives such as 100 Resilient Cities is an ideal example of this type of new governance approach. 100RC's Resilience Framework proposes inclusiveness and integrity in governance to ensure actions are appropriate, address the needs of the most vulnerable and create a resilient city for everyone (The Rockefeller Foundation, 2014). It gives insight into how networked governance should foster and improve the collaborative capacity of cities to address

resilience challenges by and it “promotes cohesive and engaged communities” (The Rockefeller Foundation, 2014 p: 3).

The *learning by doing* suggested by experimental governance links with 100RC’s proposals of delivering access to solutions and collaborators from public and private and NGO sectors in the support of the development of resilient strategies—which need to be particular to each city’s challenges—and allowing to be member of a global network of cities who can “learn and help each other” (The Rockefeller Foundation, n.d.-a, para: 6). Furthermore, 100RC tries to focus on innovative approaches and adaptive strategies to address complex urban challenge, working with a multitude of stakeholder across

In a world with uncertainty and increasing challenges posed by climate change and rapid urbanisation, it seems appropriate to rethink urban governance. In urban systems where vulnerable groups may be affected by dominant power relations, or where only certain sectors of the population are benefited from the urban tools and planning, an inclusive and cohesive participation process with engaged communities should be the rule. Furthermore, upscaling best practices and promoting more adaptive, flexible and innovative strategies that embrace the complexity of SES, while implementing a multisectoral collaborative approach, seems the adequate method to enhance urban sustainability and resilience.

CHAPTER 5. URBAN CONTEXT AND RESILIENCE CHALLENGES IN MEXICO CITY

Building on the theoretical framework, the present chapter shifts focus to Mexico City as a case study. Here, a detailed examination of the city's urban context is provided, highlighting its rapid urban expansion and pressures associated with population growth; it then provides an overview of Mexico City's most pressing resilience challenges, and finalises with resilience-building related efforts before the city joined 100RC. By presenting a sort of radiography of Mexico City, this chapter seeks to provide a comprehensive understanding of the city's resilience landscape, and the connection between theoretical concepts in resilience and how they manifest in practice.

5.1 Mexico City in Context

Mexico City (CDMX, from its abbreviation in Spanish) is part of a megalopolis, which is located in Greater Mexico City, officially called Metropolitan Area of the Valley of Mexico (ZMVM, for its acronym in Spanish). While a little over 9 million people are inhabiting CDMX only, the ZMVM is populated by around 22.3 million people (2023), which are concentrated in 59 municipalities in the State of Mexico and one in Hidalgo⁴. Once a lake, the megacity is now the second most densely populated city in the Americas and the 6th most populated metropolitan area in the world.

Geographically, Mexico City possesses an area of approximately 1485 km and an altitude of 2,240 m above sea level, and it is part of an endorheic basin located on an alluvial surface which used to make up an ancient system of lakes (Chalco, Texcoco, Xaltocan, Xochimilco, and Zumpango). Since pre-Columbian times, the area has faced hydric stress, prompting extensive hydraulic projects to control the lake water levels, mitigate flooding and secure freshwater supplies. For its geological formation, the country experiences high seismic and volcanic activity, due to its location in the Ring of Fire and the complex interactions of tectonic plates. The city is located in a basin, which, considering its altitude and intense storms, it's more prone to floods and landslides. The historical transformation of the lake system the city was built on into urban land has also exacerbated environmental vulnerabilities.

⁴ As of 2023, plans proposed to have 13 more municipalities in Hidalgo join the ZMVM.

Economically, Mexico City represented around 15 percent of Mexico's total GDP in 2023 (Instituto Nacional de Estadística y Geografía [INEGI], 2024), however strong socio-economic inequalities remain, with wealth disparities evident between urban landscapes, ultimately amplifying challenges to equitable resilience. Mexico City is a global megacity and an economic powerhouse, and among the largest and best performing economies in the Americas. When compared to other Latin American countries, ZMVM has one of the largest GDPs; in 2019, it occupied the third place (Secretaría de Desarrollo Económico de la Ciudad de México, 2019).

5.1.1 Urban Expansion

As the political, social and economic centre of the country, before, during, and after colonisation, Mexico City has experienced exponential growth and with it, changes in its urban structure. Naturally, the historic migration from rural areas to the city and urban sprawl led the once "Distrito Federal" to conurbate into other villages and towns, increasing the population of the ZMVM exponentially, which has gone from a little over 1 million in 1930 to over 22 million of inhabitants today. The combination of immeasurable urban expansion with poor urban planning, historical transformation, and geographic state, have caused a chain of events which put the city at great risk in many dimensions.

The northern and eastern regions of the city have seen the most expansion of urban sprawl since the beginning of the previous century (Sánchez Luna, 1996). However, since the 1990s, the most significant growth has concentrated in the northern part of the city and municipalities of the State of Mexico, as well as the central municipalities of CDMX. This expansion has reached the Conservation Area, as a result of lack of land reserves for housing development, leading to the degradation of environmental services that are crucial for the city such as aquifer replenishment, preservation of biodiversity, carbon storage, and others (ARCDMX, 2016). Simultaneously, this unorderly expansion has left those vulnerable areas more susceptible to shocks and chronic stresses.

Another critical dimension is the one related with water. The natural water cycle regulated by the lake system the city was built on has been disturbed by a series of large-scale drainage projects which date back to the Spanish colonisation, in an effort to make way for urban expansion. With it, the once permeable land was replaced by paved surfaces which hindered natural water infiltration while increasing the surface runoff, leading to frequent flooding (Hogenboom, 2018).

At the same time, rapid urban expansion and poor water infrastructure have led to the overexploitation of the aquifer, which simultaneously, and as a result of excessive extraction of groundwater, has caused alarming rates of subsidence. Subsidence has not only worsened the already inherent flood risks of a basin-like city but is one of other reasons for pipeline damage that contributes to an exacerbating level of water loss. Rapid population growth has intensified demand, leading to larger hydraulic systems and shifting the relationship between the humans and water from coexistence to dominion (ARCDMX, 2016).

Accelerated expansion and poor urban planning have also brought serious problems for mobility and affected the quality of life of thousands of inhabitants, making the CDMX one of the most traffic congested cities in the world (Tianfu 2017; TomTom, 2016). This challenge is also related to the spatial distribution of employment supply, which is concentrated in the central areas of the ZMVM; only four of the city's delegations provide a third of employment at the metropolitan level (ARCDMX, 2016).

Mexico City's social and physical infrastructure is under great pressure due to its rapid growth, while depleting conservation land, exploiting the aquifer, and escalating poverty and inequality. Urban expansion and poor urban planning have left the city and those more vulnerable areas more susceptible to shocks and chronic stresses such as earthquakes, water shortages and ground subsidence, to name a few, and further aggravated by the effects of climate change.

5.2 Urban Resilience Challenges in Mexico City

Mexico City faces several pressing urban resilience challenges that require urgent attention and integrated efforts. To analyse these challenges, I have categorised them into shocks and stresses. In urban resilience literature, shocks and stresses—or synonyms of these, e.g. impacts and tensions—are increasingly used frameworks to categorise urban challenges (UN-Habitat, 2018; The Rockefeller Foundation, 2019; ARCDMX, 2016).

The following sections will explore Mexico City's challenges in detail, highlighting how they manifest as either shocks or stresses and their implications for the city's resilience. The selection of these challenges is based on the analysis of likelihood of imminent crisis, academic and policy analyses, public perception, as part of this document analysis.

A preferred definition is that of UN-Habitat, which, in its City Resilience Profiling Tool, states that stresses are “chronic pressures whose cumulative impacts undermine [a] city's capacity for resilience” (2018:34). UN-Habitat further categorises them into three types based on their origin: internal, which originate within the urban system due to malfunctions or inefficiencies (e.g. traffic congestion); external, which occur independently of the urban system but still impact the city's resilience (e.g. drought) and; complex, which originate from the combined cumulative effects of internal and external stresses (e.g. pollution due to inadequate mobility policies and the city's natural basin geography). The stresses or tensions in Mexico City outlined below involve these three types.

On the other hand, shocks are defined as “sudden onset events leading, potentially, to adverse impacts unfolded within hours or days in the urban areas” (UN-Habitat, 2018:34). Shocks or impacts can be originated from phenomena of geological, hydro-meteorological, chemical-technological, sanitary-ecological, and socio-organisational nature (Ley General de Protección Civil, 2012a, 2023b, art. 2, fracc. XX-XXVII). These anthropic and natural risks have caused impacts in Mexico City such as destructive earthquakes, fires, floodings, and landslides, as well as increase in temperature, drought, heat waves and changes in precipitation parameters due to climate change, which have intensified the degree of impact on the population.

Stresses and impacts are deeply interrelated; if tensions are not addressed in a timely manner, they become potential risks and, consequently, shocks. Much of the degree of risk and impact that the city experiences is caused by this very chronic stress, by the pressure exerted over time and a lack of due diligence. Disasters are due to both poor human management and “hostile nature”; ineffective management of a country's territorial and economic development of a country amplify the impact of natural disasters on society (Calderón Villarreal & Hernández Bielma, 2012, p. 27).

5.2.1 Stresses

5.2.1.1 Water

With raised concerns about Mexico City reaching its Day Zero by 2028 (Congreso de la Ciudad de México, 2021), Mexico City is currently undergoing a hydric crisis. For centuries, the megacity has endured hydric stress in an effort to prevent flooding due to its lake city nature, causing great

pressure on its water systems. Overexploitation of aquifers, inefficient management, insufficient infrastructure, and poorly designed governance have all contributed to this crisis. The city's reliance on deep groundwater extraction has also led to alarming rates of subsidence of over 35 centimetres annually (Khorrami et al., 2023), and more recently found, 50 centimetres in northern parts of the ZMVM sinking describing the constant degradation of the aquifer as “irreversible” (Chaussard et al., 2021).

Over 60 percent of the city's water consumption is provided by the extraction from wells supplying 40,000 litres per second (Dirección General de Comunicación Social [DGCS], 2022); however, this source is constantly endangered by the city's predominance of clay in its structure and more importantly, by urban growth, as it hinders aquifer recharge by reducing areas suitable for water infiltration. The rest of the water required is supplied by sources like the Cutzamala and Lerma systems (built in the 1940s and 1970s), from each of their basins, which are water supply megaprojects designed specifically to bring water to Mexico City. The basins, naturally, are under strain, with the former experiencing its worst drought in 40 years between 2022 and 2023 (Equipo de redacción de Ciencia, 2024). Overexploitation of these basins has not only destabilised the subsoil but has also intensified competition for resources with neighbouring states, as the intense Lerma system has prioritised sourcing the megalopolis at the extent of rural communities surrounding the Lerma Lake. At the same time, neglected water infrastructure has resulted in around 35 and 37 percent of the city's water is lost in leaks along the distribution infrastructure, this means that the city loses water at an average rate of 12,500 litres per second (INFO CDMX, 2023; López et al., n.d.; DGCS, 2022), while its insufficient supply infrastructure fails to meet the needs of the entire population. An expert on political ecology of water from UNAM, Dr. Avila Garcia, suggests:

“Mexico City is an example of the greatest urban and energy unsustainability, which generates rural-urban tensions” (Gil Yáñez, n.d.)

The hydric crisis is also characterised by declining federal investment in water management. The water supply, wastewater management, and drainage fell from 57 billion MXN in 2012 to 38.5 billion MXN in 2023—a 32% decrease in real terms (Ríos, 2023).

Reversing the water problem requires talk of redistribution. In Mexico City, priority for access to water has been given to middle- and upper- class areas and the rest has been forgotten.

Inequitable water distribution has disproportionately benefited wealthier areas, leaving marginalised municipalities such as Iztapalapa, Tlalpan, Tláhuac, Xochimilco and Milpa Alta—home to nearly 600,000 people—facing chronic water scarcity, and other rural communities, especially indigenous, in the State of Mexico, Toluca and Michoacán. In some areas water access is limited to four days a week, and in others, residents only rely on rainwater collection or sporadic delivery by tanker trucks (Figueroa-Oropeza et al., 2023). Having daily water access has become a privilege for a diminishing minority, and there has been no political will to eradicate this spatial discrimination through massive movement from west to east (Ríos, 2023)

Finally, climate change and natural phenomena such as La Nina bringing drought for the last three years and El Nino causing less rainfall than expected further exacerbate this crisis. This climate phenomena have caused that one of the dams supplying the ZMVM, the Lerma Cutzamala dam system, to go from its regular capacity of 70%, to only 37% in 2023 (González Díaz, 2024).

5.2.1.2 Mobility

For the last decades, mobility in Mexico City has been characterised by an exorbitant vehicular congestion and a concerning degree of pollution, insufficient public transport and sustainable mobility services, and a deep socio-economic fragmentation of access to sustainable mobility solutions. Mobility restrictions put pressure on the environment, health, safety, social equality, productivity, and overall quality of life. The mobility topic is one of the biggest challenges of urban development planning in the city, that if not addressed, will trigger a reaction of adverse consequences.

The widespread use of cars, once seen as a time-saving benefit for the more economically advantaged, has led to massive traffic jams, reduced speeds, restricted movement due to pollution, and road oversaturation, ultimately harming mobility and the quality of life of thousands of its inhabitants, making the CDMX one of the most traffic congested cities in the world (Tianfu 2017; TomTom, 2016) and the most traffic congested in the country. According to the 2023 INRIX Global Traffic Scorecard (INRIX, Inc., 2024), automobile drivers in CDMX lose an average of 96 hours annually due to vehicular congestion with an average speed of 19 km/h, while public transport users could lose up to 25% more in comparison (Instituto Mexicano para la Competitividad, 2019). This explosion of transit is also fuelled by the daily influx of inhabitants from the municipalities outside of the city (ZMVM), given Mexico City's position as a political,

economic, and cultural centre. Moreover, the population growth trend is stronger in the municipalities on the periphery than in the ones of Mexico City, increasingly necessitating an efficient, integrated, and extensive public transport network.

The public transportation system is the main mode of transport in CDMX, carrying around 4.6 million people daily (Unidad de Estudios de Finanzas Públicas, 2022). Most of the population in CDMX uses public transport, however little budget is invested towards its extension and integration, as opposed to the investment on infrastructure for the use of automobiles. For decades, public policy and infrastructure investment prioritised private over public transportation, leading to a large increase in vehicle numbers while at the same time creating challenges for lower-income families without access to cars. By 2023, the city had 6.4 million cars circulating in the city, the largest number ever recorded. At the same time, the use of bicycles is widely discouraged due to insufficient cycling lanes throughout the city and an uneven distribution of these, coupled with poor transit education, making it extremely dangerous for cyclists to move around, but also for other susceptible road users. Motorcyclists, cyclists, and pedestrians represented 81% of traffic fatalities between 2019 and 2022 (World Health Organisation, 2024). The ever lack of policies to disincentive car use has exacerbated these issues, straining urban mobility and equality. Safety on the units of public transport is another factor added to the equation. The high incidence of crime as well as harassment towards women is concerning. This has also pushed many inhabitants to resort to private transport services such as taxis, Uber or Didi, spending a large percentage of their monthly income simply to avoid becoming a victim of crime.

The relationship between the municipalities of Mexico City and the ones on the periphery, has been an unequal one. Although there is a constant exchange between municipalities, for mainly employment reasons, urban development and mobility have not been developed in an integrated manner. The supply of jobs and services are slanted towards the higher-income municipalities of Miguel Hidalgo, Benito Juárez, Cuauhtémoc and Coyoacán, attracting daily long metropolitan trips from the far surrounding municipalities, which reflect the unequal distribution of access to opportunities and services in the city (SEMOVI, 2020).

5.2.1.3 Pollution

Mexico City's geographic location as a basin surrounded by mountains results in a natural barrier that hinders the free circulation of wind and dispersion of pollutants, hence trapping a high concentration of local pollutants in the city and resulting in poor air quality. On average, of the total CO₂ emissions generated by the city since 2018, 72% correspond to mobile sources, which are any automotive transport, of which 34% is accounted to private vehicles and SUVs (Secretaría del Medio Ambiente de la Ciudad de México [SEDEMA], n.d.). As of 2020, a float of 6.2 million vehicles circulated in the ZMVM, of which 97% used gasoline and with: 93% accounting for private vehicles (cars, SUVs, motorcycles); 5% for public transport (buses, taxis, vans, minibuses, Metrobus, Mexibus, etc.) and; 3% for cargo (tractor trucks and others) (SEDEMA, 2020)⁵.

5.2.1.4 Social and Economic tensions

Mexico City is a global megacity and an economic powerhouse, and among the largest and best performing economies in the Americas. In 2023, the city represented around 15 percent of Mexico's total GDP (INEGI, 2024). However, strong socio-economic inequalities remain, with wealth disparities evident between urban spaces making challenges to equitable resilience more evident.

High levels of income inequality have left marginalised communities disproportionately disadvantaged in access to basic services such as water and transport, and more vulnerable to disasters. In 2022, 62.8 percent of Mexico City's population was living in multidimensional poverty⁶, of which 14.3 percent were living in extreme multidimensional poverty and 48.5 percent in moderate poverty (Consejo de Evaluación de la Ciudad de México, 2024). While the gap between the higher and lower social stratum has appeared to reduce through the last decade (2013-2023), significant inequality remains. Besides a Gini score of 0.413, 10 percent of the city's richest households receive 45% of the total income, or 20 times more than the poorest 20 percent (Oxfam México, 2020).

⁵ The data may present an atypical behaviour of the socio-economic dynamic, due to the COVID pandemic resulting in a general reduction of activities and mobility in the city. However, there was no official data reported after this year.

⁶ Multidimensional poverty means to have one or more social deprivations (access to health services, social security, quality and space in housing, basic services in housing, and food), and simultaneously insufficient income to acquire the goods and services required to meet their needs.

Rapid and poorly planned urban expansion has also aggravated socio-economic disparities, causing inequitable access to resources and services such as water, housing, transport, and employment. As noted across the multifaceted stresses above, inequality is a constant factor. For instance, mobility challenges are further exacerbated by the disparity in the distribution of the transport network in peripheral areas, increasing costs and commute times, as well as the unequal distribution of employment opportunities across central and peripheral areas of the city. The major water issue, which is also deeply intertwined with social and economic tensions; we observe that middle- and upper-income municipalities in the ZMVM enjoy better supply in comparison to lower-income areas. Policies that prioritise disproportionate water extraction for the industrial sector have worsened water stress in vulnerable regions and caused social conflicts (Ríos, 2023). The inequitable distribution of water represents deeper problems in urban planning and governance, creating wider social and economic gaps.

The growth of urban sprawl has not only been deliberately disconnected from water and mobility policies, but also from housing policy. Urban informality has come as a consequence of the explosive urban growth over decades and impacting social, economic and environmental dimensions. In Mexico City, there are over 850 Irregular Human Settlements⁷, also known as informal settlements or slums⁸, where with nearly 41 thousand houses and over 241 thousand inhabitants (MCNP, 2024)⁹. Ninety percent of these informal settlements are located in four major municipalities in the city (Milpa Alta, Tláhuac, Tlalpan, and Xochimilco) (Instituto de Planeación Democrática y Prospectiva de la Ciudad de México [IPDP], 2022). These areas, also popularly known as “lost cities”, are characterised by groups of houses made of low-quality materials (usually carton, recyclable and waste materials), generally located in the periphery or far from the urbanised areas lacking close access to most basic services, and with high levels of marginality and criminality, as they are located in areas that are difficult for the authorities to access. These settlements are generally found on areas classified as at-risk, such as hillsides and hilltops, along rivers and canals, increasingly vulnerable to threats like flooding and landslides, as well as greater risk of damage from earthquakes due to the precarious housing construction. The occupation of land unsuitable for urban development has not only socio-economic implications, but

⁷ As defined by the CDMX Institute of Democratic and Prospective Planning, the existence of these settlements is characterised by the formation, persistence and growth of precarious and self-built housing, in which most of their inhabitants do not have legal certainty over their homes.

⁸ As defined by UN-Habitat (2018), a slum household is a group of individuals living under the same roof in an urban area, lacking one or more of the following: 1) access to improved water source; 2) access to improved sanitation facilities; 3) sufficient living area; 4) housing durability; 5) security of tenure.

⁹ Whereas the ZMVM is home to one of the world’s largest slums (Neza-Chalco-Itza), housing nearly 4 million people.

environmental ones; human irregular settlements have increasingly extended to Mexico City's Conservation Soil—which accounts for 59 percent of the territory—in which 8 municipalities are currently located, including the ones with the highest concentration of informal settlements in the city (IPDP, 2022).

5.2.1.5 Governance

In the understanding that effective governance is crucial to achieve urban resilience and sustainability, fragmented governance lies at the core of Mexico City's urban resilience challenges. More specifically, fragmented governance has challenged the implementation of a coordinated approach towards sustainability and resilience strategies targeted at the most pressing issues in the areas of water, mobility, housing, socio-economic and regional disparities, environmental protection, disaster and risk management. This fragmented governance in terms of urban planning touches upon areas like regional, and intra- and inter- government coordination, and reflects on a multidimensional level. The Organisation for Economic Cooperation and Development (2015), recognises the absence of strong regional coordination and regional planning frameworks as a major challenge in key areas such as water management, mobility, and protection of natural resources, leading to negative consequences for the quality of life in the ZMVM.

The lack of cooperation between regions creates disparities in access to services, with certain areas experiencing discrimination in terms of infrastructure and resource distribution. The most illustrating example of this is the tension around water access, as mentioned before, also as a result of fragmented control over the resource; the city heavily relies on water resources extracted from surrounding states, causing regional conflicts, as well as disparities on access across municipalities. Moreover, financial constraints, deeply related to corruption at the political level, hinder the implementation of integral and efficient resilience and sustainability initiatives. The overexploitation of aquifers and poor water supply infrastructure highlight the city's "struggle" to allocate sufficient resources. Similarly, investment in public transport and infrastructure has been unequal and insufficient across all sectors of the city's population, causing inadequate services and worsening social disparities.

The problem with proper regional coordination is also related to how different levels of government (CDMX, State of Mexico, and Federal Government) each has its own set of policies and

regulations in different areas. Urban planning in CDMX and the State of Mexico is heavily affected due to inconsistent regulations between regions, resulting in challenges to manage the urban sprawl and the consequences of it. As we have seen above, the fragmented control over the water management or the lack of coordination in transportation infrastructure have brought this scaling consequences like unequal water supply, shortages and burdened access to basic services.

Public safety is also aggravated by the different police jurisdictions (between local, state and federal police forces), affecting crime prevention, but also disaster response, as there is often unclear coordination between authorities, resulting in delayed, inadequate, or differing response mechanisms across different levels of government (Alcántara-Ayala et al, 2022). This is as well related to land use planning policies which are inconsistent across regions and poorly coordinated, largely contributing to a cascade of events: informal settlements, unequal access to resources, environmental degradation, and more.

All of these consequences of inefficient governance are further aggravated by corruption, political interests, political willingness, and insufficient resources that strain government efforts; we cannot take these elements out of the equation. It cannot be stressed enough the crucial role that political processes have in the construction of urban resilience, those processes that can aid not only in overcoming tensions but to avoid intensifying the existing ones.

5.2.2 Impacts

5.2.2.1 Geological

Mexico City faces significant seismic challenges due to its geological, structural and urban characteristics. As part of the Ring of Fire, Mexico City sits on the Trans-Mexican Volcanic Belt and it's highly affected by tectonic activity due to its position near the convergence of the Cocos and North American plates, making the city increasingly exposed to frequent and potentially intense earthquakes. Moreover, major volcanoes near Mexico City include the Popocatepetl and Iztaccihuatl, which are both part of the volcanic arc formed by the subduction process (California Institute of Technology, Tectonics Observatory, 2009).

The city has experienced its worst two earthquakes in the last 39 years. The fact that Mexico City is built on a lakebed which consists of soft soil, increases the risk of stronger and more prolonged earthquakes. Moreover, many structures in the city are quite aged and were constructed before modern seismic codes were implemented (Tena-Colunga, et al., 2020), making a number of still-

existing buildings quite vulnerable. Population density, coupled with the concentration of economic and social infrastructure aggravates the impact of seismic events, increasing the potential for human and economic losses. As a result of this vulnerability, Mexico City has endured several catastrophic earthquakes over the 20th and 21st century:

- March 14, 1979: a 7.6 magnitude earthquake off the coast of Guerrero, caused significant damage in the southern part of the city, with 5 fatalities, over 30 injured and 600 buildings reportedly affected, causing an estimated economic loss of USD 30 million (Secretaría de Gestión Integral de Riesgos y Protección Civil de la Ciudad de México [SGIRPC], n.d.; National Centers for Environmental Information [NOAA], n.d.).
- September 19, 1985: an 8.1 magnitude earthquake was the deadliest and most devastating in Mexico since the twentieth century. With an epicentre in the coasts of Michoacan, it resulted in extensive urban destruction in the city, with more than 412 buildings collapsed, over 3,100 damaged, around 33,000 people injured, and a death toll ranging from 9,500 to 35,000 (Comisión Económica para América Latina y el Caribe [CEPAL], 1985; Masse & Needham, 1989). Economic losses are estimated at 2.7 percent of the country's GDP, or around USD 4 billion (around USD 9 billion in current costs) (CEPAL, 1985).
- September 19, 2017: exactly 32 years after the previous one, and one year after the release of the Resilience Strategy, a 7.1 magnitude earthquake hit near Puebla, causing 228 fatalities, 73,000 buildings to be damaged and 44 structures to collapse. The economic impact was estimated at 0.1-0.3 percent of the country's GDP, or from USD 2.5 to 3.4 billion (Resilient Cities, 2018; United Nations Office for Disaster Risk Reduction [UNDRR], 2024).

5.2.2.2 Hydrometeorological, socio-organisational, and chemical-technological

While the highest direct economic costs have been associated with the damage caused by seismic activity—specifically the 1985 earthquake—other disruptive phenomena like hydrometeorological, socio-organisational, and chemical-technological events have affected the population more frequently. For instance, reports indicate a high frequency of repercussions on population originating from hydro-meteorological events within the 1980-2015 period, affecting almost fifty thousand people and causing over USD 30 million in damages (ARCDMX, 2016; Iwa Network, 2025). The panorama or the situation does not improve; if we examine the data from

2019 and 2020¹⁰, the city's vulnerability extends beyond seismic risks. According to SGIRPC (2020), the economic impact of natural and anthropic events in 2019 totalled approximately USD 16.4, equalling 0.0091% of Mexico City's GDP, where the most significant disruptive phenomena were:

- Chemical-Technological (56%): Urban fires, primarily in markets¹¹, due to gas installations and lack of maintenance, as well as homes, and businesses, causing damages for ~USD 7.6 million.
- Socio-Organisational (32%): Road accidents, massive population concentration-related damages, thefts, and others, accumulating around ~USD 4.9 million in damages.
- Hydrometeorological (9%): Storm-related damages, specifically due to torrential rains and strong winds causing fallen trees and flooding resulting in damages for ~USD 1.4 million.

In 2020, the damage from natural and anthropic shocks to approximately USD 37 million (SGIRPC, 2022). Without counting the pandemic, there was a shift in the most affecting disruptive events according to SGIRPC (2022):

- Socio-Organisational (61%): automobile accidents rose, likely due to increased speed on emptied roads during pandemic lockdowns, causing staggering damages of ~USD 9.8 million.
- Hydrometeorological (19%): Strong winds and torrential winds caused ~USD 2.9 million in damages which are closely linked to floodings, trees at risk and housing.
- Chemical-Technological (14%): Urban fires, including forest fires, resulted in losses of ~USD 2 million.

Mexico City also consistently experiences a high number of forest fires. In 2019, the National Forestry Commission of Mexico (CONAFOR) reported damages of USD 217,000. In 2020, there were damages worth USD 121,000, with a reported affected area of 1,806 hectares. The fires were concentrated in Conservation Land, Protected Natural Areas and Federal Zones such as the city's ravines. In both years these numbers made the city the first and fourth most affected in the country, respectively.

¹⁰ Years selected due to a. 2019 was the first year showing the most comprehensive data in comparison to the years 2013 or 2015, and b. no accessible data after 2020. However, a source from 2015 reveals that the most significant impacts were caused by hydrometeorological, geological, and chemical technological.

¹¹ Affections are felt on a cultural level too, as markets have been declared Intangible Cultural Heritage of Mexico City.

5.2.2.3 Sanitary-ecological

Sanitary-ecological phenomena have too increased Mexico City's vulnerability. In 2020, the COVID-19 pandemic put the city's and country's resilience to the test, causing economic losses worth around 10.3% of Mexico City's 2019 GDP (Soria, 2023). Additionally, 44, 235 deaths were officially recorded in CDMX (Dirección General de Epidemiología [DGE], 2023). However, this was not the first time the city suffered greatly from this kind of phenomena in the 21st century; back in 2009, CDMX faced the AH1N1 pandemic that, while the death toll was relatively low (146 country-wide), it resulted in an economic impact of nearly 1% of the city's GDP (Organización Panamericana de la Salud, 2010, as cited in Hernández-Ávila & Alpuche-Aranda, 2020).

5.2.3 Climate Change threats

Climate change has intensified urban resilience challenges overall, as it has contributed to more extreme weather patterns and increase in average temperature causing heat waves, torrential rains, severe drought and changes in precipitation parameters (ARCDMX, 2016), affecting water supply, agriculture and infrastructure, to name a few.

The Intergovernmental Panel on Climate Change (IPCC) (2014) reports an expected increase in the intensity and frequency of extreme weather events which could cause droughts, severe flooding caused by heavy rainfall, and heatwaves, in the short and medium term. For Mexico City, it is forecasted by 2030 an increase in average temperature between 0.5°C and 1.25°C, and between 1.25°C and 1.50°C for the cold and warm months, respectively; and by 2050, an increase of up to 2°C and 2.25°C is expected for the cold and warm months (ARCDMX, 2016). The Mexico City Climate Action Programme of 2014-2020 reported that 5.6 million people in the city have been found to be vulnerable to climate change on different degrees, and the need to prioritising hydro-meteorological-related adaptive capacities, especially floods has been strongly emphasised (Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente, 2014).

5.3 Efforts in Building Urban Resilience before 100RC

Mexico in general has made efforts to enhance sustainable development by adhering to diverse global initiatives, including frameworks such as the Agenda 21 or the Kyoto Protocol, which

undoubtedly contribute to resilience building and vice versa. These programmes, however, require financial resources, institutional development and the establishment of executing bodies that some experts suggest need to be strengthened (Sobrino et al., 2015).

In recent years, the Mexico City's government in particular, has made efforts in strategic areas that contribute to resilience building before becoming part of 100 Resilient Cities. Figure 1 shows a chronological example of these government strategic efforts in the shape of acts, programmes and strategies, that have contributed to the city's resilience building. These efforts have been traditionally concentrated on risk mitigation and disaster prevention, responding to the city's historic disaster events. And since the 2000s, more strategic areas have been given greater importance, especially climate change mitigation and adaptation -mostly influenced by global environmental pressures such as the frameworks mentioned above-, as well as civil protection, mobility, and social inclusion.

The concept of resilience across different areas started gaining momentum in 2008. For instance, the Mexico City's Climate Action Programme (PACCM) (2008-2012), the first public policy planning instrument for climate change in Mexico, emphasised the importance of resilience to climate change challenges, and highlighted the need to integrate resilience into public policies, while including societal initiatives that entail the involvement of communities to participate in resilience-building activities. The PACCM also promotes urban planning strategies such as the incorporation of green infrastructure and sustainable practices. The following PACCM, the 2014-2020, emphasises building resilience as a core objective, and it is focused on reducing vulnerability to extreme weather events especially impacting those more affected groups (SEDEMA, 2014). The PACCMs, together with other climate acts, are some of the most important tools for the city's sustainable development. Their focus relies on climate change resilience, and adaptation and recovery from phenomena not caused by man. However, since 2013, there have been other strategic policy tools in the area of mobility, such as the CDMX Comprehensive Mobility Programme (PIM) (2013-2018) which guides the specific actions and goals of the mobility policy in the city; it has strategic pillars and actions for each, aimed at achieving an integrated transport system, fewer cars, mobility culture, transport-oriented development, and others (Ley de Movilidad del Distrito Federal, 2014).

These government policy tools have fostered initiatives based on international cooperation to strengthen Mexico City's resilience efforts, focused on climate change. For instance, the city

joined the C40 Cities network in 2008, whose aim was to promote collaboration with other global megacities to tackle climate change challenges. Mexico City has also engaged with Local Governments for Sustainability (ICLEI) to share best practices and development of climate policies, participating in ICLEI's initiatives, such as the Cities for Climate Protection programme, which supports local governments in reducing greenhouse gas emissions and enhancing urban resilience (SEDEMA, 2012).

The city shows its commitment to resilience building efforts by joining 100 Resilient Cities in 2013. The Resilience Strategy aims to enhance previous initiatives and programmes in the city by incorporating targeted actions (ARCDMX, 2016), while at the same time, previous efforts have served as a basis for the design of the Strategy. The participation of CDMX in 100 Resilient Cities marked an important step in the city's construction of resilience and on a new governance approach, which we will go into depth in the following chapter of this thesis.

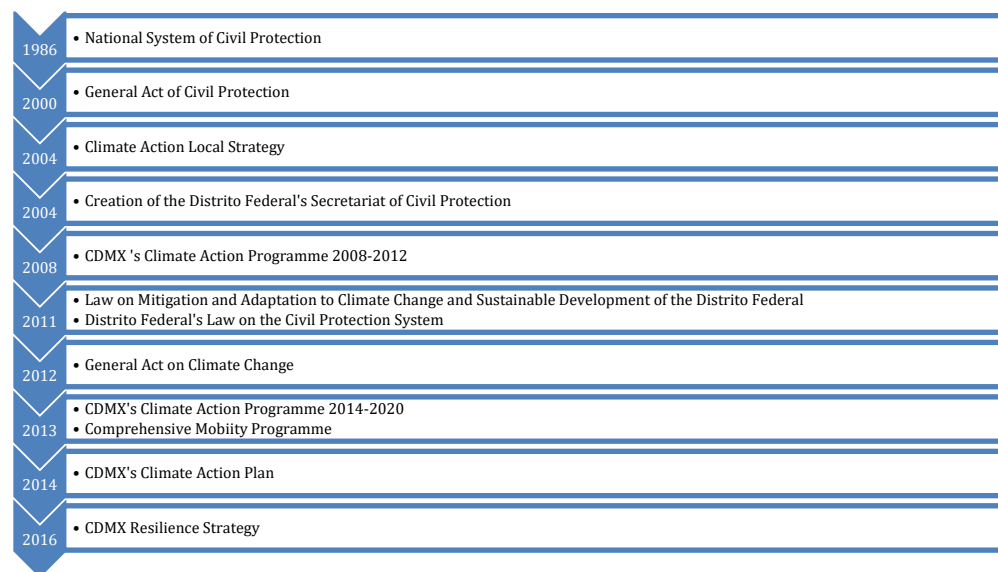


Figure 1: Mexico City's Resilience Efforts (Source: Adapted from the CDMX Resilience Office, 2016)

CHAPTER 6. URBAN RESILIENCE IN PRACTICE: UNWRAPPING 100RC IN MEXICO CITY

Having established Mexico City's urban context and resilience challenges previously, this chapter examines the city's engagement with the 100 Resilient Cities initiative by exploring its implementation and the proposed governance model in practice. It studies how 100RC's global resilience framework translated into local action, shaped decision-making, institutional structures, and policy outcomes. By unwrapping the implementation of 100RC in practice, this chapter connects global resilience governance to the real-world application to Mexico City, while starting to provide a reflection on the legacy 100RC left in the city to be further explored in the upcoming chapter.

6.1 Introduction to 100 Resilient Cities

In 2013, the Rockefeller Foundation released its initiative 100 Resilient Cities (100RC), with the aim of supporting cities globally to become more resilient to physical, economic and social shocks. For this, 100RC invited cities to apply to be selected to become part of the network and receive support in the shape of funds and other services to help them create a plan for resilience. The Rockefeller Foundation (2013) defined urban resilience as the “capacity of a city (individuals, communities, institutions, businesses and systems) to survive, adapt and thrive no matter what kinds of chronic stresses or acute shocks they experience”.

According to the Rockefeller Foundation (n.d.-b), in order to be selected, cities had to demonstrate a real commitment to enhancing urban resilience and demonstrate how multiple actors from diverse sectors would be diligently involved in the process and how their efforts will improve the lives of the most vulnerable groups. Of the 1,000 cities applying, 100 cities were chosen to be part of this network, including Mexico City, making up together more than a fifth of the global urban population (The Rockefeller Foundation, n.d.-a). Cities in the network received resources and support in four ways:

- Funds to develop a resilience strategy, according to each city's particular risks and hazards
- Funds to appoint a Chief Resilience Officer, who will lead and coordinate all actions related to resilience building in the city

- Access to pro bono services from a partner platform
- Access to a global network to share knowledge on ideas and innovation

Six years after launching, 100RC announced it was formally closing in July 2019, which meant phasing out funds from the Rockefeller Foundation. The news came out as a surprise, considering that 47 out of the 100 cities had yet to finish developing their resilience strategies by then, leaving many wondering what will happen with the positions created and the actions that began to be implemented after this (Fastenrath et al., 2019a).

6.2 Mexico City Resilience Strategy

After the application process and becoming part of the network in 2013, CDMX developed in 2015 and presented on September 6, 2016, its Mexico City Resilience Strategy (ERCDMX, for its acronym in Spanish), herein, often referred to as the “Strategy”. With character of policy tool, the document sought to implement comprehensive solutions with a medium- and long- term vision, to address the challenges brought by globalisation, urbanisation and climate change, as well as their social and economic repercussions (SEDEMA, 2016). The development of the Strategy was funded by the Rockefeller Foundation and channelled through the Mexico City Public Environment Fund; the investment was \$3,991,256 MXN (SEDEMA, 2020), or approximately \$212 thousand USD.

Based on the 100RC’s methodology, which will be explained further below, the Strategy was designed around 5 strategic axes or pillars, which were understood as the most pressing urban resilience challenges and for which targeted actions were created (ARCDMX, 2016):

- 1. Fostering regional coordination**
- 2. Promoting water resilience**
- 3. Planning for urban and territorial resilience**
- 4. Improving urban mobility**
- 5. Developing innovative and adaptive capacity**

As stated in the Strategy, these strategic axes respond to the main challenges described in said document, according to the perception of actors from various sectors as well as opinions from

stakeholders in the construction and insurance industries¹²; most notably: earthquakes, pollution, shortage of drinking water, social conflict, flooding, and others. Some of the most relevant tensions were identified through a consulting process involving actors from various sectors and classified based on perceived risk level they represent; most notably: social inequality, poverty, wealth distribution, urban growth, vehicular congestion, exploitation of the aquifer, and others. Impacts and tensions related to climate change were deducted based on temperature projections with the UNAM's CDMX Virtual Climate Change Centre; most notably: flooding, fires, landslides, heatwaves, water shortage due to drought, and others.

It is also noted that the document should be a “living document” that requires ongoing evaluation and adaptation to respond to a dynamic and changing context, and that given its broad scope, “some relevant topics had to be excluded” (ARCDMX, 2016, p. 59).

These pillars are further divided into 17 goals, 44 actions and 121 activities that correspond to CDMX's particular shocks and stresses, or impacts and tensions (ARCDMX, 2016) (see Figure 2). Each axe or pillar contained specific actions and activities (such as plans, programmes, measures) that could be ongoing actions, high-impact actions and proposed actions for the future. Three types of stakeholders were to implement all activities, namely: responsible actors, participants and partners (ARCDMX, 2016, p. 59), which entailed a mix of government entities, civil organisations, 100RC partners, private sector and Academia, depending on the case. A specific temporality was specified for each action to be executed: a timeline for the activity to be implemented: short term (2016-2018), mid-term (2016-2025), and long term (2016-2040). For example, the activity 4.3.1.1 “Create the Center for Road Safety”¹³, involved the participation of actors like the Secretariat of Citizen Security (SSP), the Mexico City's Administrative Office (Oficialía Mayor), the Secretariat for the Environment, and the Resilience Agency, with partners like the InterAmerican Development Bank (BID) and the organisation Coalición Visión Cero, to be implemented in the period 2016-2025.

¹² See pages 30 and 34 of the Mexico City Resilience Strategy.

¹³ This activity corresponded to the strategic pillar 4: Improve Urban Mobility, with Goal 4.3: Create a safe and accessible city for pedestrians and cyclists, and Action 4.3.1: Implement the Vision Cero Initiative. This activity is a follow-up on the efforts between Mexico City and the Swedish Embassy to implement Swedish initiative aimed at deterring human losses caused by transit accidents.

According to the Mexico City Resilience Strategy, this framework guided its development by supporting the evaluation and analysis of resilience to shocks and stresses, facilitating data collection and stakeholder engagement, and identifying the actions -based on strengths and weaknesses-, that should be promoted to address the city's most pressing challenges (ARCDMX, 2016).

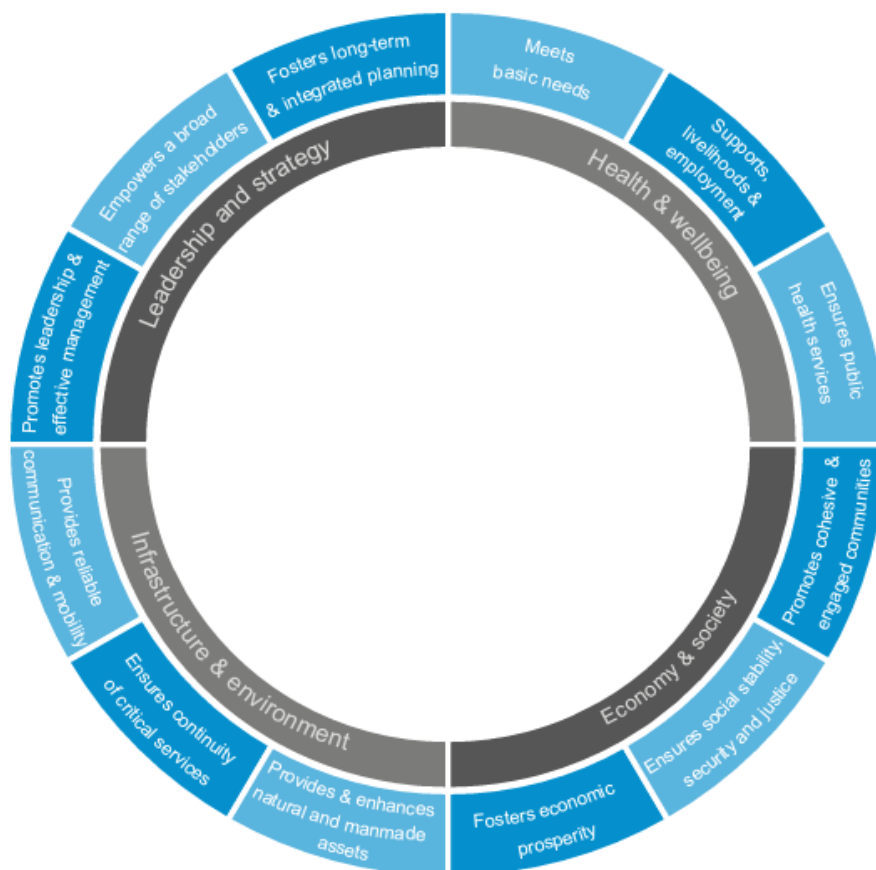


Figure 3: The City Resilience Framework (Source: Agencia de Resiliencia de la Ciudad de México, 2016, English version)

In order to “globally unify the way in which a city’s resilience is assessed and thus analyse and compare with other 100RC participating cities” (ARCDMX, 2016, p. 45), this methodology tool is set forth as a sort of best-practice mechanism or “good urban governance” guidebook for resilience. It is observed, however, that this nor any other proposed framework provides specific details for implementation, but rather superficially approaching the proposed topics. Moreover, they advocate for “good governance through the investment in actions”, while omitting any

mention of political aspects, or issues of equity and justice, all essential for resilience and sustainable development. This omission raises questions about how genuine governance improvements can be achieved.

Whilst 100RC provided a methodology through its CRF, it did not provide any mechanism to evaluate the quality of the Strategy; in this sense, structural gaps were not assessed. Additionally, 100RC lacked a mechanism for evaluation to measure the initiative's progress, which in turn affected the Strategy and its resulting actions. The existence of a mechanism for evaluation of actions constitutes a big part of the initiative's legacy; more on this will be provided in the following sections.

6.3 Governance Structures and Stakeholder Dynamics

The governance approach entailed the involvement of a diverse group of stakeholders implementing the initiative in Mexico City. Firstly, the development of the CDMX Resilience Strategy consisted of a participatory process with inputs from experts in the public, private and scientific sectors, as well as NGOs. Following 100RC's methodology, the process aimed to develop an inclusive process in which different perspectives could be taken into account. The development of the document underwent three phases where interviews, surveys, workshops and expert meetings were conducted, resulting in the creation of focal areas to work on, followed by the formation of working groups with experts from different sectors to develop specific problems and areas of opportunity for each relevant topic (ARCDMX, 2016). This was accompanied by thorough research and data collection across government documents, literature and insights from subject-matter experts through interviews, surveys and workshops, and extensive interdisciplinary collaboration across sectors. The purpose of this method was to ensure an inclusive approach involving diverse perspectives to understand the city's challenges and opportunities (ARCDMX, 2016).

The Strategy's design and development was possible under the lead of the Resilience Steering Committee, created by a federal climate change commission -the CICCDF¹⁵-, and consisted of stakeholders from several sectors (see structure on Figure 4), who reviewed and validated activities and the overall Strategy before its submission to the CICCDF (ARCDMX, 2016).

¹⁵ Federal District Inter-Institutional Climate Change Commission, in accordance with the Federal District Act for Climate Mitigation and Adaptation.

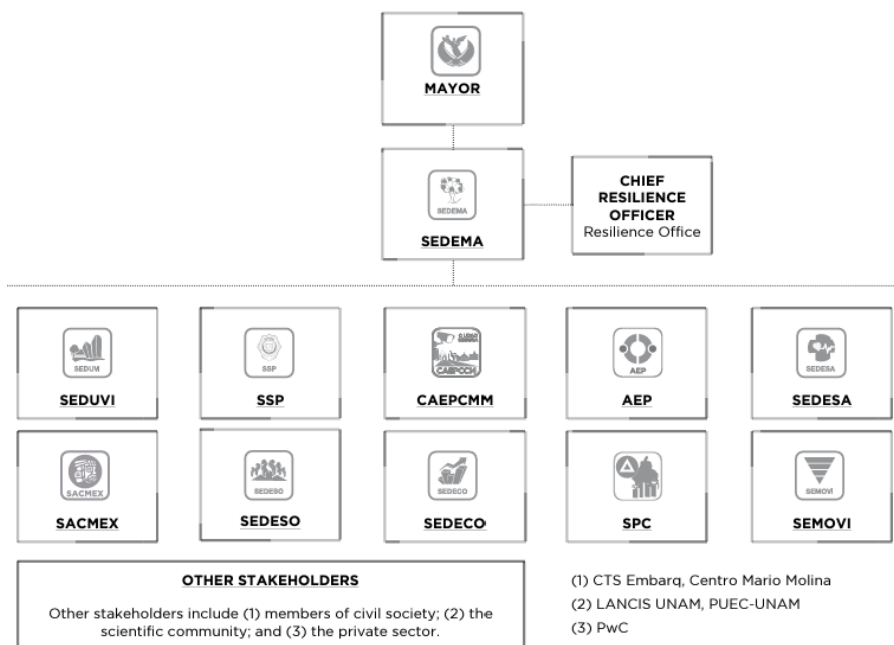


Figure 4: Structure of the Resilience Steering Committee (Source: Agencia de Resiliencia de la Ciudad de México, 2016, English version)

The Strategy contains 121 activities that offer a wide scope of multi-actoral, multi-scalar, and multi-spatial action, as they focus on capacity building at the personal, community and urban system levels (Alonso, 2019). The actors involved maintained an active role during the process of development of the Strategy and each axe or pillar contained specific actions and activities (i.e. plans, programs, measures) which were to be implemented by a mix of government entities, civil organisations, 100RC partners, private sector, Academia, and others, depending on the case, and specified a timeline for the activity to be implemented. Table 1 displays each of these actors specifically identified in the development of resilience actions, categorised by sector and affiliation.

Table 1: Institutional Stakeholders in the Mexico City Resilience Strategy, by Sector and Affiliation (Own creation with data from CDMX Resilience Office, 2016)

Government	Private sector	Academia & Research organisations	Civil Society and NGOs	100RC Partners	Other actors/organisations - banks
AEP CAEPCCM CENACED CENAPRED CICCDF COMETRAVI CONAGUA CONAFOR CONAPO CONAVI CONEVAL CORENA Council of Native Peoples and Neighbourhoods ECOBICI INFONAVIT OCAVAM OM OR PAOT SACMEX SAGARPA SECITI SEDATU SEDECO SEDEMA SEDEREC SEDESA SEDESO SEDUVI SEFIN SEMARNAT SEMOVI SG SINAPROC SOBSE SPC	AICM A911 Audi Banamex CEMEX FEMSA PWC RMS Veolia	CMM COLMEX EAP IMTA INECC INEGI IPN LANCIS- UNAM UAM UNAM	Bicitekas Coalicion Vision Cero Conservation International CTS Embarq FICEDA Fundación Carlos Slim Fundación ICA Fundación Rio Arronte Isla Urbana ITDP LabCDMX MakeSense TNC	AECOM Arup Deltares RBD	ARISE BID WB CAF C40 GIZ OECD UNISDR

SSP STCM					
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* Government, Academia and some Civil Society acronyms refer to the name of the organisations in Spanish, the definitions of these and other acronyms can be found on the List of Acronyms on page IV of this thesis.

** Government entities include city Secretariats or Ministries, with a few ones at the federal level, decentralised bodies, and institutes managing public funds.

6.3.1 Mexico City's Resilience Agency and the Chief Resilience Officer (CRO)

With the funds provided by 100RC, a Resilience Office was created in 2017, the Mexico City's Resilience Agency (ARCDMX, for its acronym in Spanish). The ARCDMX was a decentralised body attached to the Secretariat of the Environment (SEDEMA), with management autonomy. This body played a central role in strengthening the city's resilience, as it was the organisation in charge of executing the Resilience Strategy, designing and implementing measures, and possessing a coordinating authority for collaborative efforts across all CDMX ministries and stakeholders involved to implement actions aimed at building urban resilience. In other words, the ARCDMX consolidated the efforts of the government, stakeholders and 100RC to institutionalise resilience and implement the Strategy.

Directed by Dr. Arnoldo Matus Kramer, the Agency was made up of 10 professionals in total within the fields of sustainability, urban planning, climate change, biology, geography, and engineering, amongst others, appointed across the areas of Monitoring and Evaluation, Planning, Research and Innovation, Projects, Legal Affairs and Substantive Equality.¹⁶

¹⁶ More information to be found at: www.resiliencia.cdmx.gob.mx/agencia/estructura

The Agency played a crucial role in fostering the participation of diverse stakeholders in the development of resilience actions. It not only organised a variety of workshops and collaborative initiatives at both the national and international levels but also facilitated dialogues among participants. These efforts brought together government entities, local communities, non-governmental organisations, and international partners, promoting a comprehensive approach to disaster risk reduction and climate resilience (ARCDMX, 2016). Through these collaborations, the agency enhanced knowledge sharing and best practices to address resilience challenges.

The Chief Resilience Officer (CRO), a position also financed with the programme's funds, held a highly relevant and strategic position for the overall implementation of the Resilience Strategy. Referred to as “resilience champions” by the Rockefeller Foundation (2019), the CRO was a strategic tool to influence different spheres of government and acted as a network facilitator, with capacity to connect and break the bureaucratic burden in the city governments departments (Naef, 2022). When CROs were directly incorporated into municipal governance structures, they had a level of access and power that went beyond individuals in the civil society. Moreover, since their position was being financed by an international organisation, supporting the role represented a good scheme to elevate the profile of resilience in regions or municipalities that are usually restrained by low funds (Zebrowski, 2020).

Dr. Arnoldo Matus Kramer, an academic with extensive experience in climate change adaptation and sustainability, renewable energy, and related fields¹⁷, was appointed CRO -also referred to as “Director of Resilience”- for Mexico City. From 2014 to 2018, as CRO and Director of the Resilience Agency, Dr. Matus led the creation and implementation of the CDMX Resilience Strategy. Some highlights of his time as CRO included his advocacy for green infrastructure projects, such as urban reforestation and water conservation efforts, as well as ensuring continuity on resilience actions beyond 100RC (Matus, 2021).

6.3.2 Global network

The global network the city gained access to by becoming part of 100RC, allowed the relevant city stakeholders to participate in international activities such as the World Summit on Resilience, the COP 21 and a CROs experience-exchange in Rotterdam. Moreover, it *granted* the city the

¹⁷ For full profile visit www.resiliencia.cdmx.gob.mx/agencia/acerca-de#titular_3, or www.linkedin.com/in/arnoldo-matus-kramer-bb66014/

opportunity to be chosen as part of the ARISE initiative, an alliance created to promote collaboration with private-sector organisations to build urban resilience, specifically for disasters (ARCDMX, 2016).

The purpose of this exposure to a global network was to have a space where cities and CROs, alongside 100RC partners, could share their experiences, gain knowledge on key topics, exchange ideas, and try out similar strategies for implementation in their own cities. CDMX took some examples from the resilience strategies implemented by other member cities to apply to its own Strategy which it referred to as “inspiration” (ARCDMX, 2016: 69-144). Below are some examples taken from the official document:

- THE NATURAL DISASTER RESILIENCE COMPETITION (NDRC) UNITED STATES - for Pillar 1, Foster regional cooperation 1.1, institutional coordination and regional strategic communication.
- MELBOURNE, AUSTRALIA: METROPOLITAN FOREST - for Pillar 1, 1.2 drive and support regional projects.
- NEW ORLEANS - rainwater catchment for Pillar 2 Water resilience.
- ROTTERDAM: CLIMATE RESILIENT DISTRICT. - for Pillar 3, Plan for urban and regional resilience. Activity to develop projects for developing resilient urban areas.
- VISION ZERO NEW YORK CITY - for Pillar 4, Improve Mobility, Action to implement the Vision Zero initiative.
- URBAN TRANSFORMATION - METROCABLE MEDELLIN - for Pillar
- REBUILD BY DESIGN – WORKING TOGETHER TO BUILD A MORE RESILIENT REGION - to develop innovative and adaptive capacity.
- RIO DE JANEIRO STRATEGY: FEATURED ACTION -EDUCATE CHILDREN FOR RESILIENCE. (pp. 144-145, Pillar 5. Action to develop initiatives focussed on vulnerable groups).

6.3.3 100RC Platform Partners

The programme gave its member cities access to their Platform Partners who would provide a series of pro bono services and solutions to help cities develop and implement their Resilience Strategies (The Rockefeller Foundation, 2013). This platform consisted of private sector entities including consultancy organisations within the fields of urban planning and sustainable

development (i.e. Arup, AECOM, etc.), as well as NGOs and not-for-profit organisations (i.e. World Bank, UNESCO, Save the Children, etc.).

While this variety of partners participated in the design of strategies for the city, as can be observed on Table 1, 100RC specifically promoted the resilience-building tools and services of certain consulting firms, who started by offering pro bono services to potentially contract them out in the future. After the government of the city's pledge of 10 per cent towards resilience actions, 100RC ensured financing of 5 million USD for Platform Partners services until 2020 to support the city's efforts to build resilience (ARCDMX, 2016). In the case of Mexico City, there was significant participation and interaction with some consulting firms like Arup¹⁸, AECOM¹⁹, Deltares²⁰, SIWI²¹, and Bain & Company²², all 100RC partners. For instance, Arup created the methodology (CRF) on which the CDMX Resilience Strategy was based on and helped with the overall development of the plan.

The city's earthquake of September 19, 2017, increasingly pushed and focused the efforts from 100RC and the Resilience Agency towards seismic resilience. The Government of Mexico City and the Rockefeller Foundation Philanthropy Advisors (RPA) signed a grant agreement to execute the Mexico City Resilient Recovery Plan after the earthquake (RPA et al., 2019). Further activities originated as a result of this MoU; for instance, a Water Resilience Plan for the Heritage Zone of Xochimilco, Tlahuac and Milpa Alta (2019)²³ to address the current ecological impact on the area and wetlands, which was a study conducted by Deltares in collaboration with university UAM and company ERN²⁴. Furthermore, a study conducted in collaboration between the Mexico City government and diverse stakeholders with the Rockefeller Foundation including several Platform Partners: "Learning from the Earthquake to be more Resilient"²⁵.

¹⁸ British multinational firm providing design, engineering, planning, architecture and advisory services (www.arup.com)

¹⁹ US infrastructure consulting firm (www.aecom.com)

²⁰ Not-for-profit Dutch institute for knowledge on water and the subsurface (www.deltares.nl)

²¹ Stockholm International Water Institute (www.siwi.org)

²² US global management consulting firm (www.bain.com/)

²³ Water Resilience Plan for the Heritage Zone of Xochimilco, Tlahuac and Milpa Alta https://issuu.com/norismorales/docs/resil_reprt_total

²⁴ Mexican company on natural risks assessments (<https://ern.com.mx/web/>)

²⁵ "Learning from the Earthquake to be more Resilient" (originally in Spanish "Aprender del Sismo para ser más Resilientes") www.resiliencia.cdmx.gob.mx/storage/app/media/Publicaciones/aprender-del-sismo-para-ser-mas-resilientes.pdf

Another effort motivated by the 2017 earthquake was the 100RC Network Exchange on “Building Seismic Resilience: Preparedness, Response, Recovery” in 2018, with the participation of US-based EERI²⁶, with diverse relevant stakeholders in Mexico City, the Resilience Agency and nine 100RC member cities including Cali, Kyoto, Los Angeles, and others (Bishop, 2018). Thanks to this collaboration, participants were able to share experiences, perspectives, tools and best practices in the areas of resilience for critical water infrastructure, housing for vulnerable communities, and citizen response and engagement strategies (Arendt et al., 2018).

Other publicly known collaborations that resulted in tangible results like plans or agreements between Mexico City and Platform Partners include the following:

- Municipal strategy document for rainwater management containing recommendations and measures for water management in the city (De Urbanisten, n.d.), elaborated by Deltares.
- The City Water Resilience Approach - City Characterisation Report Mexico City (2019)²⁷ by Arup in collaboration with the Rockefeller Foundation, SIWI, SEDEMA, Semovi, SACMEX, Conagua, and other government agencies, NGOs, private sector and scientific communities in Mexico and abroad.
- Inputs and support by Bain in the planning process after the city’s 2017 earthquake. “Theoretical framework for identifying initiatives to increase a city’s seismic resilience, with examples from CDMX”²⁸
- “Towards a Water-Sensitive Mexico City”²⁹, collaboration between De Urbanisten, Deltares, the Public Space Authority (AEP), SACMEX, and others.

The integration and promotion of these companies, in particular, allowed them to have direct access to- and communication with decision-makers in the government, along with opportunities for interaction at the community level. It also granted them access to in-depth assessments, feedback and crucial information on pressing local issues, i.e. the specific needs of each

²⁶ Earthquake Engineering Research Institute (www.eeri.org/)

²⁷ City Water Resilience Approach - City Characterisation Report Mexico City www.arup.com/globalassets/downloads/insights/c/city-water-resilience-approach/characterisation-report/ccr-mexico-city.pdf

²⁸ “Theoretical framework for identifying initiatives to increase a city’s seismic resilience, with examples from CDMX” www.resiliencia.cdmx.gob.mx/storage/app/media/Publicaciones/marco-teorico-para-identificar-iniciativas-para-incrementar-la-resiliencia-sismica-de-una-ciudad.pdf

²⁹ “Towards a Water-Sensitive Mexico City” <https://agua.org.mx/wp-content/uploads/2018/01/Hacia-una-Ciudad-de-M%C3%A9xico-sensible-al-agua.pdf>

municipality, and the governance structures in place. Additionally, having prior endorsement from 100RC positioned these companies favourably as potential service providers in the future.

The program strongly promoted the use of these Platform Partners for cities to develop their strategic plans, which makes evident that, even though the Rockefeller Foundation is a philanthropic body, the profit element was an important factor in 100RC's attempt to improve urban resilience (Zebrowski, 2020). In a way and linked to the body of criticism towards initiatives like 100RC, this raises questions about who benefits from these partnerships and for whom the resilience value is created.

6.4 Outcomes of the participation in 100RC

6.4.1 Actions

The original plan for this part of the research was to map all the actions delivered as part of the Resilience Strategy. It resulted however, a nearly impossible task; for one, there is currently no tracking system of activities in place for the public to access and review—it should not be forgotten that the Strategy is an important instrument of public policy with mandatory character of observance—. Secondly, even after trying to track the 121 activities proposed by the Strategy, all actions towards resilience building implemented in the city by ministries, NGOs, and civil society cannot be directly linked to the Strategy, except when explicitly mentioned. The CDMX had developed its Climate Action Plan Programme (PACCM)³⁰ for 2014-2020, which integrates, coordinates and promotes actions to reduce environmental, social and economic risks derived from climate change (SEDEMA, 2014), involving all dependencies of the public administration. The creation of the program overlapped with the city's annexation to 100RC; hence we cannot attribute nor completely disregard 100RC's impact or relationship with CDMX decisions around resilience building over the past 10 years.

As already mentioned, there was not provided nor is in place any sort of MRV tool to keep track of actions and activities derived from the Strategy regarding their implementation and/or status. There was a proposed MRV tool by the LANCIS-UNAM³¹, which never materialised as part of the Strategy as it is not existent today. The lack of such a tool not only threatens the legitimacy of the

³⁰ Climate Action Plan Programme www.gob.mx/cms/uploads/attachment/file/164914/PACCM-2014-2020completo.pdf

³¹ National Laboratory of Sustainable Sciences - National Autonomous University of Mexico

Strategy, and the program overall, but it also makes it hard to assess the impact of these efforts and this new proposed governance approach.

Additional to the outcomes delivered as a result of the collaboration between Platform Partners and Mexico City stakeholders mentioned on page 49, there were further actions identified where it is explicitly stated a link with the Strategy and 100RC.

For example, the “Installation of rainwater catchment systems in houses with water scarcity”, which corresponds to activity 2.1.3.1, action 2.1.3, Axis on Water, of the Resilience Strategy. The main partner responsible, Isla Urbana³², had started installing these systems in the city and near demarcations already since 2009. From their start until 2016, a number of 3380 catchment systems had been installed. After the release of the Strategy, during the period designated for the activity (2016-2018), a number of 5120 catchment systems were installed in the marginal localities of CDMX such as Tlalpan, Xochimilco and Iztapalapa, which surpassed the 300-goal proposed by the Strategy (Alonso, 2019). According to the results of a study conducted by Alonso (2019:44), the installation of these systems significantly improved the lives of the inhabitants and most importantly, they have “developed the adaptive capacity in the families that have appropriated this technology, who recognise that the possibility of capturing water during the rainy season in Mexico City guarantees the decentralisation of the current distribution system”.

Another activity identified from the Strategy was the “Expansion of the Ecobici³³ system”, which corresponds to activity 4.2.1.1., action 4.2.1, Axis on Mobility. The main partner responsible for this activity is the CDMX Secretariat of the Environment. During the period 2016-2018, a total of 28 new bicycle stations were installed, 67,786 new users were registered, and 25 cycling lanes were created with a total extension of 16.6 km, in comparison to the 452 stations that were installed since the creation of Ecobici in 2010 until 2016 (Alonso, 2019). Based on a 2018 Ecobici User Perception Survey, “75 percent of Ecobici’s users have noticed changes in their quality of life”, improving their physical condition and using less automobile transportation means (Alonso, 2019:45).

³² Mexico based project dedicated to contributing to water sustainability through rainwater harvesting; their aim is to guarantee hydric security in water-scarce communities, foster community development and to contribute to the basin’s hydric balance (www.islaurbana.org/isla-urbana/)

³³ Ecobici is the public bicycle sharing system, launched by the government of Distrito Federal (CDMX) in 2010. It is the sixth largest public bicycle system worldwide.

Furthermore, months after the earthquake of September 19, 2017, the Resilience Agency created the Law for the Reconstruction, Recovery and Transformation of Mexico City into an increasingly resilient city, with a primary focus on building resilience in the face of earthquakes, linked to water and mobility as well (SCJN, 2018). This, together with the efforts made in collaboration with the Platform Partners in respect of seismic resilience³⁴, seems to indicate that the 2017 earthquake represented for the CDMX government a call to reinforce disaster and risk management, water and mobility governance, as well as to integrate more strongly the concept of resilience in the city's policies on these areas.

Now, the city made various efforts in the progress towards resilience building that happened after it joined 100RC. These actions were not explicitly responses to the Strategy, nor were they said to be linked to the Strategy; however, they might have been influenced by the overall participation of the city in 100RC. The following activities have been tracked down:

- In 2016, SEDATU, in coordination with ONU-HABITAT and SEGOB, pushed forward the Resilient Cities Network initiative, which is the first effort of this kind by the Federal Public Administration. It provides financial resources to 20 cities to elaborate their Urban Resilience Profile, applying the methodology designed by SEDATU “Urban Resilience Guide”³⁵ to be used by municipal authorities.
- The city released its Local Climate Action Strategy 2021-2050 (ELAC), and its Climate Action Programme 2021-2030 (PACCM)³⁶, both which set the objectives, measures and goals for moving towards low-carbon and resilient development in Mexico City, framed within the approaches and principles of the circular economy, social inclusion, human rights and gender equity (SEDEMA, n.d.).
- In 2023, Mexico City presented its General Plan for Development (PGD) and the General Plan for Territorial Management (PGOT), both which establish the guiding principles for ordering and regulating the city's space in the future (Redacción Capital Noticias, 2023).
- In 2023, the government of the State of Mexico launched “Plan Colibri”, a 100-action initiative to improve sustainable mobility. It focuses on fighting corruption, ensuring safety, upgrading and unifying the transport network, promoting cycling, promoting gender-

³⁴ “Theoretical framework for identifying initiatives to increase a city's seismic resilience, with examples from CDMX” and “Learning from the Earthquake to be more Resilient”

³⁵ Urban Resilience Guide www.gob.mx/cms/uploads/attachment/file/179708/Guia_de_Resiliencia_Urbana_2016.pdf

³⁶ PACCM & ELAC www.data.sedema.cdmx.gob.mx/cambioclimaticocdmx/images/biblioteca_cc/PACCM-y-ELAC_uv.pdf

focused initiatives and new projects such as the Mexicable and Chalco-Santa Martha trolleybus (EDOMEX et al., 2023). This is a great advance in the area of Mobility; while it never makes any mention of 100RC, it includes lines of action very much related to those outlined in the Strategy for the area of Mobility.

- In 2021, CDMX joined the Making Resilient Cities 2030 initiative (MCR2030), a global partnership addressing urban resilience, disaster risk reduction, climate change, and the SDGs, in which 100RC is also a partner. As a result, Mexico City became one of the first MCR2030 Resilience Hubs, a recognition awarded to local governments that demonstrate commitment to “supporting and guiding other cities in disaster risk management, resilience, and climate action” (UNDRR, 2022, para. 3).

The CDMX Political Constitution of 2017 is a key document, as it for the first time includes resilience as part of the public agenda within the Areas of environment and risk mitigation and prevention (Gobierno de la CDMX, 2017).

It's important to mention that, although the adoption of the concept of “resilience” was present since the creation of the city's climate agenda in 2012, the concept was not given greater importance until the adoption of the Resilience Strategy in 2016. It's also fair to say that the dialogues exchanged between relevant stakeholders during the time of 100RC may have influenced discussions during the city's climate strategy policymaking, and that the Strategy may have contributed to the efforts from other ministries adapting their priorities. This, however, should not diminish the credit for the climate efforts the city had undertaken prior to that time.

6.4.2 Institutionalisation

The support from the city government administration of the time, under the mandate of Mayor Miguel Ángel Mancera (2012-2018), was a crucial element for the positioning of the Resilience Strategy as a public policy instrument and for the involvement of various public administration organisations. In addition, the government demonstrated its commitment to the initiative when in 2015, together with other member cities, signed the “10% Resilience Pledge”³⁷ in which it commits 10% of the city's annual budget to implement actions that enhance resilience in the city (Acuerdo por el que se expide la Estrategia de Resiliencia de la Ciudad de México, 2018 p. 29).

³⁷ “Declaración de Compromisos de 100 Ciudades Resilientes”

The concept of resilience was first inserted into Mexico City's Political Constitution in 2017, and in 2018, the Resilience Strategy was included in the city's Official Gazette, granting it mandatory observance by all CDMX government ministries. This, together with the subsequent creation of a decentralised body of the Secretariat of the Environment, the Resilience Agency, this resulting institutionalisation marked one of the biggest successes in the city's journey towards resilience.

6.5 Changes in politics and the end of 100RC

In 2018, the city experienced its change of government and with it, changes on the administrative level that directly impacted the implementation of the initiative. Five years after CDMX became part of 100RC and only one and a half years after the release of the Strategy and the creation of the Resilience Agency, the government decided to shut down this office. The government's plan was to merge the Agency with the extinct Secretariat of Civil Protection to create the, previously mentioned, Secretariat of Comprehensive Risk Management and Civil Protection (SGIRPC). The SGIRPC, through its Directorate of Resilience, would then adopt the tasks of the previous resilience office, i.e. implementing the Strategy, coordinating actions across ministries, continuing building resilience in the city, etc. Just as original structured, the Resilience Council remained, which is integrated by 19 dependencies of the CDMX government, 16 municipalities and over 40 organisations including federal and state government, international organisations, NGOs, Academia, civil society and private sector, although it is not certain if the stakeholders from the originally created committee were the same. The Council's operations are based on three main working bodies called Resilience Technical Commissions: Urban and Territorial, Water, and Seismic (SGIRPC, 2023).

It should not be forgotten that the Resilience Agency had been created as a decentralised body of the Secretariat of Environment; this change in the administration, still in effect as of 2023, meant that the coordinating body which is in charge of the Strategy and its implementation:

1. is no longer a decentralised body of a government secretariat, but instead a department - the Directorate of Resilience-, within a secretariat, in a way causing a decrease in autonomy and adding more bureaucratic silos;

2. is no longer an arm of a ministry for environment, but of a ministry for risk management and civil protection, which may change the perspectives and priorities for resilience building;
3. its role and existence depend on the federal budget allocated to the SGIRPC, as opposed to the previous funding provided by 100RC.

Another detail worth noting is that the members conforming the extinct Resilience Agency, most of which experienced first-hand the learning-by-doing approach and the process of the design and implementation of the Strategy since the beginning, are no longer part of the newly created body taking the lead. Just as with the general government administration, new administration possibly meant new priorities, especially when political parties changed. The originally appointed CRO left the Agency one year before its closure. The only remaining member at that time, Norlang García, was subsequently appointed as the Director of Resilience for SGIRPC.

As of 100 Resilient Cities, it announced it was formally closing in July 2019, six years after launching, which meant phasing out funds from the Rockefeller Foundation. The news came out as a surprise, considering that 47 out of the 100 cities had yet to finish developing their resilience strategies by then, and leaving many wondering what will happen with the positions created and the actions started after this (Fastenrath et al., 2019a). The philanthropic body however, stated that it would commit 8 million USD to continue supporting the efforts of member cities and CROs, which could help further global efforts to pursue the progress done during 100RC (The Rockefeller Foundation, 2019).

It might be that the decision of closing the agency was already informed by the subsequent termination of 100RC, as the role of a CRO and resilience officers in the agency would no longer be financed by an external organisation.

CHAPTER 7. INTERVIEW CONTENT ANALYSIS

This chapter presents the empirical analysis of the interview data. As specified in the methodology part of this thesis, four qualitative semi-structured interviews were conducted with experts who were involved in the participation of Mexico City in 100 Resilient Cities; in the design and/or implementation of Mexico City's Resilience Strategy, and/or participated in the Resilience Agency, and who are still involved in building resilience in the city. The purpose of the interviews is to understand how the initiative and resulting Strategy have impacted the city's resilience transition by exploring the achievements, actions, opportunities and challenges, as well as the governance process that took place³⁸.

7.2 Codifying and Sorting Interview Data

The data collected from the semi-structured interviews went through a codification process and analysis. The audio recordings of the interviews which were originally conducted in Spanish were transcribed verbatim and then translated into English for the data analysis. Subsequently, the transcripts were subjected to a coding process assisted by computer-assisted software program MAXQDA 2024. The creation and selection of names for the codes was meant to give answers to the research questions of this study. Codes were refined, grouped and organised into different themes to find and analyse the most important elements of the interviews.

Following the structure of the Interview Guide, the data under analysis was divided into three topics that also serve as main codes, namely:

- a. *Participant* - setting a focal point on the interviewee and her/his vision on urban resilience
- b. *CDMX under 100RC* - covering the period from 2013 to 2019, which accounts for the duration of Mexico City in 100RC
- c. *CDMX post-100RC* - covering the period from the closing of the initiative in 2019 until the present day (2023).

³⁸ Special attention was put in the way these experts perceived the participation of Mexico City in 100RC, independently from my own views and conclusions after the completion of this research, as such, a significant number of quotes has been highlighted in this analysis.

Following a hierarchical form, these main codes at the same time count with their respective subcodes or subcategories, accounting for a total of 26 codes for. A visual map of the structure and coding can be seen below (Figure 5: Creative Coding for Qualitative Analysis).

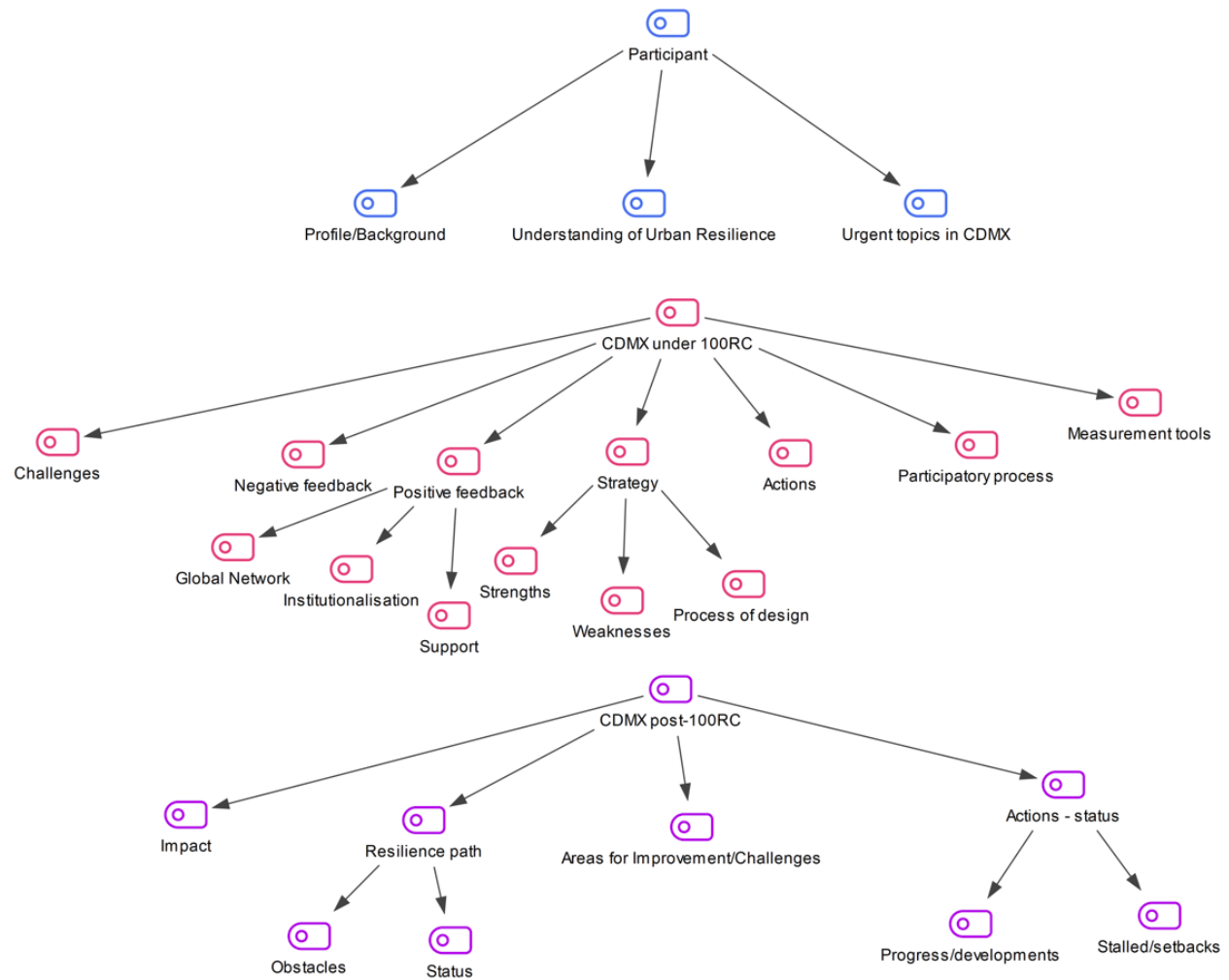


Figure 5: Creative Coding for Qualitative Analysis (Own data and creation using MAXQDA 2024).

Each code and subcode is assigned a certain criterion, which, while providing a description, justifies the creation of that code and is application to certain segments within the interview transcripts. This Code System table can be found below (Table 2: Code System for Qualitative Analysis), with the criteria under the *Memo* column, followed by *Frequency*, which indicates how many segments and documents have been coded with selected codes. The coded segments will later serve for the content analysis which follows.

Table 2: Code System for Qualitative Analysis (Own data and creation using MAXQDA 2024).

Code System	Memo	Frequency
Code System		504
Participant	Includes participant or interviewee information such as profile, their own understanding of urban resilience and the topics they believe are most pressing in Mexico City.	34
Profile/Background	Interviewee's background and how he/she participated in Mexico City's annexation to 100 Resilient Cities.	6
Understanding of Urban Resilience	Expert's view and understanding of urban resilience.	6
Urgent topics in CDMX	Mexico City's most urgent topics or pressing issues on urban resilience, according to the interviewee.	22
CDMX under 100RC	From the city's annexation until the closing of 100RC, all relevant aspects covering CDMX's participation in the initiative	96
Actions	Any actions mentioned or statements related to actions executed from the Strategy or to the catalysation of previously existing actions or programmes.	9
Challenges	Challenges observed by the interviewee related to the CDMX's participation in 100RC; statements can refer to the design and/or implementation of the Strategy.	32
Measurement tools	Statements regarding measurement tools to track the Strategy's actions and impact.	4
Negative feedback	Negative elements observed by the interviewee regarding the city's participation in 100RC.	13
Participatory process	Refers to statements regarding the participatory process of the Strategy -and whether it was participatory-.	6
Positive feedback	Positive elements observed by the interviewee regarding the city's participation in 100RC.	27

Global Network	Statements made by the interviewee regarding the opportunity for the city to join a global network through 100RC.	4
Institutionalisation	Statements made by the interviewee regarding the institutionalisation of urban resilience achieved from CDMX's participation in 100RC.	7
Support	Statements made by the interviewee regarding the support received by 100RC during the city's participation.	14
Strategy	Statements regarding the process and its strengths and weaknesses.	26
Process of design	Any additional insights regarding the process of the design of the Strategy	9
Strengths	Statements regarding the Strategy's strengths or positive elements to highlight from it.	5
Weaknesses	Statements regarding the Strategy's weaknesses or negative elements.	13
CDMX post-100RC	CDMX after the closing of 100RC in 2019; where the city is , what is the aftermath of the city's participation and where the city is headed.	56
Actions - status	Status of any actions or developments after 100RC	18
Progress/developments	Statements regarding progress or development in urban resilience actions.	12
Stalled/setbacks	Any actions that seemed to have not worked yet that seemed to be stalled or any apparent setbacks from 100RC until now.	3
Areas of Improvement/Challenges	This refers to challenges and areas according to the interviewee that need to be improved for Mexico City's transition to urban resilience.	11
Impact	Achievements/positive contributions derived from the city's participation in 100RC. Code could also refer to any efforts made.	14
Resilience path	Statements referring to where Mexico City is headed and/or the status of its resilience path. This can include actions or changes	18

	that affect the city's path towards urban resilience, and/or any progress made after 100RC.	
Obstacles	This can include actions or changes that negatively affect or affected Mexico City's path towards urban resilience.	13
Status	This can include progress, actions or changes that affect Mexico City's path towards urban resilience.	5

7.4 Content Analysis

Once the coded segments were examined, the content analysis was divided into three sections as the original interview structure, with subsections that do not specifically represent the coding structure above, but a compilation of these codes. The analysis is presented as follows:

- 1. Participant**
 - 1.1 Participant's profile
 - 1.2 Urgent Topics
 - 1.3 Understanding of Urban Resilience
- 2. CDMX under 100RC**
 - 2.1 Challenges
 - 2.1.1 *The political aspect*
 - 2.1.2 *Timing*
 - 2.1.3 *Monitoring/Tracking progress*
 - 2.1.4 *Other challenges*
 - 2.2 Positive feedback
 - 2.2.1 *Key elements a. Global Network; b. Support; c. Institutionalisation of resilience*
 - 2.2.2 *The Strategy*
 - 2.2.3 *The role of the Resilience Agency in the Strategy's design and participatory process*
 - 2.3 Measurement Tools
- 3. CDMX post-100RC**
 - 3.1 Impact
 - 3.2 Obstacles
 - 3.3 Areas for improvement/Challenges
 - 3.4 Resilience actions - stalled
 - 3.5 Resilience actions - progress
 - 3.6 Efforts post 100RC/Developments

7.4.1 PARTICIPANT

1.1 Participant's profile

The experts interviewed belong to diverse contexts including government, private sector and Academia. All of them—also currently exercising in the field—have background in Geography, Economics, Architecture, Public Policy and Sustainability, and extensive experience on climate change, sustainable development, geography, urban planning, and risk mitigation and prevention. The identity of the participants was anonymised, hence the explicit positions they held during the time of their participation in the initiative, as well as at the present time, have been hidden.

These experts participated in the annexation of Mexico City in 100 Resilient Cities in different ways, for instance: in the development of the city's application to the program; in the creation of the Resilience Agency; in the design and implementation of Mexico City Resilience Strategy; and/or directly in the Agency within areas associated with monitoring and evaluation, coordination of participating groups, and others.

1.2 Urgent topics

All experts agreed that Mexico City faces many pressing issues related to urban resilience; in its majority, they agreed on the following aspects:

- *Water.* All participants coincided in the topic of Water as the most critical one and that needs to be addressed immediately. With the exploitation of the aquifer water management strategies need to be implemented. There is currently a serious situation of scarcity, shortages and resource management.
- *Mobility.* Experts agree that an integrated-multimodal transport system is needed to move the people that transit the city every day.
- *Housing.* With the pressure put on the city due to the limitless expansion of population, housing also becomes a problem. The urban sprawl towards the Conservation Areas in the south of the city, which is the most important area for the recharge of the aquifer, also poses the risk of having to stop the rectification of other areas of the city. The need for affordable or social housing was raised, given the increasing price of land, which also puts pressure on the population.
- *Seismic phenomenon.* Historically relevant, specifically regarding the two last devastating earthquakes Mexico City experienced.
- *Droughts.* Mentioned briefly
- *Flooding.* Mentioned briefly

The following topics were also mentioned by some experts and considered as urgent:

- *Environment*. An interviewee stressed the need to harmonise the urban with the environmental part, as “50 percent of Mexico City is conservation land while the other is urban land” (Interview 2, Pos. 54).
- *Integrated Risk Management*. Prevention and adaptation need to regain strength; “it needs priority in public policy” (Interview 3, Pos. 16). It is also noted that risks are usually studied separately, and not for instance, the event of the risk of two catastrophes acting together, in this sense it was considered that the city may not be prepared to handle two or more catastrophes at the same time.
- *Urban Planning*. An integral urban planning is considered as crucial, stressing the fact of having a good link between Mexico City and surrounding states.
- *Pollution*
- *Integral planning*
- *Innovation and use of data*
- *Socio-spatial inequality*
- *Violence and gender violence*

1.3 Understanding of Urban Resilience

Expert 1 emphasises that, besides adaptive capacities, transformative capacity is crucial for urban resilience. Similarly, monitoring and tracking progress is essential, and only through indicators or indices can it be defined if a system is becoming resilient over time (Interview 1, Pos. 19).

Expert 2 emphasises the role of the government and considers that urban resilience lies within its capacity to foresee the impact of a phenomenon or a stress, control it and emerge from it. This requires the commitment of all ministries to build capacities for assimilating any impact or stress (Interview 2, Pos. 60). It is also suggested that resilience involves proactive planning, foreseeing and creating capacities, meaning “having plan a and plan b”, and it requires a shared vision among stakeholders (Interview 2, Pos. 63 & 64).

Expert 3 specifically provides the meaning of urban resilience as the “*capacity of an urban system to adapt, survive and continue to develop despite the impacts and tensions that arise along the way*”, and considers that a holistic perspective on development processes is necessary for

resilience-building, not just during crises but throughout the capacity development (Interview 3, Pos. 12).

Expert 4 agrees with the definition given by the Rockefeller Foundation, i.e. “the capacity of people, communities or cities to adapt to events, between impacts and stresses”, highlighting the importance of dividing shocks and stresses, where the former refers to sudden impacts and the latter happen over time (Interview 4, Pos. 63)

7.4.2 CDMX UNDER 100RC

From the city’s annexation until the closing of 100RC, this section contains all aspects considered relevant for the analysis of CDMX’s participation in the initiative. This includes all information touching upon the positive and negative feedback about the initiative, the Strategy that emerged including actions as well as weakness and strengths and the challenges for the contribution of the Strategy to resilience in CDMX, the challenges or obstacles presented, in the view of the interviewees. Additionally, it includes some insights about the measurement mechanisms whether they existed or not, and about the participatory process that took place, as well any relevant opinions expressed about the process.

2.1 Challenges

2.1.1 *The political aspect*

All interviewees emphasised the aspects of governance and government changes, and how these impacted negatively on the success of the implementation of the Strategy and resilience actions in general. Political changes such as the switch of government administration in the city in 2018 that led to the closing of Mexico City’s resilience office, the Resilience Agency, were usually -half of the interviewees- considered to have a negative impact on the role and vision of the Agency, and therefore on the implementation of the Strategy.³⁹ An expert considered that the position of the resilience office was *downgraded* by being now part of an executive directorate within a body that is focused on risk prevention and mitigation (Interview 1, Pos. 27). Similarly, it had been observed that there was a lack of commitment to the project by the appointed government administration.

³⁹ The Resilience Office was initially created as a decentralised organism of the Secretariat of the Environment (SEDEMA) and after its closing, all resilience actions included in the Strategy were passed on to the then created Resilience Directorate within the SGIRPC.

Oftentimes, maintaining the momentum of ongoing actions becomes a challenge when there is a change in government leadership in CDMX; the introduction of a new administration brings with it a new team along with a whole new set of people and ideas. In this sense, the shift in leadership in 2018 was considered a disruption to the work done by the Resilience Agency, together with the departures of key staff that may have affected the momentum and continuity of the Strategy's implementation

There was some criticism in terms of the Resilience Agency being under the umbrella of the Secretariat of the Environment (SEDEMA), with arguments mentioning that projects and actions on the Strategy were too inclined towards the environment and climate change, making it a “repetition” of SEDEMA's own plan (Interview 2, Pos. 34).⁴⁰ Similarly, there was little collaboration with the old Secretariat of Civil Protection. It was also suggested that it was more important for the Resilience Office to have interministerial capacity—for instance, interact with SEMOVI, SEDATU, SEDEMA, SEP, SGIRPC, and others—to make the decision-making process more efficient (Interview 3 Pos. 22). In this sense, the Agency's aim was to be an agency underneath the Office of the Head of Government, a plan for which implementation was impeded by the 2017 earthquake.

The model of resilience units or offices seem to depend greatly on each city's conditions and political decisions. Units can be closely linked to Environment, the initial case of CDMX, or, linked to Risk Management, which is the current case of CDMX under the SGIRPC⁴¹. In this sense, both the resilience strategy model and the Chief Resilience Officer *must survive* government changes.

Another challenge for the implementation of the Strategy's actions that were considered as “crucial” was regarding resources. It was mentioned by one of the interviewees that the number of resources needed to implement what the Strategy states is “enormous”, adding: “... *why do I think it hasn't worked? Because you need money to make things happen, and resilience strategies have hardly ever been tied to a share of money*” (Interview 2 Pos. 39).

The element of *political will* is stressed as an essential factor that can either hinder or facilitate the progress of the initiative and subsequent efforts. It has been stated that the involvement of

⁴⁰ This in relation with the Plan of recovery of the Xochimilco-Tlahuac-Milpa Alta heritage zone.

⁴¹ Secretariat for Integral Risk Management and Civil Protection

Mexico City's head of government back in 2013 made an undoubtedly positive impact for the project to be pushed forward and for many government actors to be involved. In the words of some experts, there was a "strong commitment to the process" in the government administration (Interview 3, Pos. 20), and the city's Mayor involvement in the initiative made other government actors genuinely interested in the project (Interview 3, Pos. 57).

As for the Resilience Strategy, an expert observed that the document "only serves as a roadmap" for other ministries to base their development plans on, and these can decide to either adopt it or not; in the end, ministries respond to their own vision or to what the Head of Government asks them to do (Interview 2, Pos. 15).

The success of the initiative or the implementation of the Strategy in the city in this respect cannot be attributed to the initiative itself or to Rockefeller, as changes in government and political will in each city are outside their scope of action. The 100RC council have no say in this, apparently; as one expert acknowledges, the resilient transition process and action must be executed at the local government level:

*"They (100RC) cannot influence in any way, their job is to institutionalise the issue of resilience, to create the figure of the CRO, to create the Resilience Agency, to promote development. 100 Resilient Cities gave a huge amount of money to a hundred cities so that they could institutionalise this, and **then it is the city's job to maintain it**"* (Interview 2, Pos. 43).

On the other hand, changes in 100 Resilient Cities also seemed to have affected the momentum of the initiative in Mexico. It was pointed out that before its closure, 100RC began to detach itself from the Rockefeller Foundation, the support to the cities started decreasing, while the number of cities wanting to join the initiative was growing.

2.1.2 Timing

Time constraints were a key challenge for the success of the Strategy; most of the experts agreed that the Resilience Agency's role had too little time to meaningfully influence its implementation, which meant that 100RC's potential did not go beyond the administration. This time constraint also makes it hard to confirm whether resilience actions implemented over time were actually linked to the Strategy or if the Agency succeeded in a cross-cutting relationship with other ministries. In this sense, experts considered that the Strategy "did not mature" after the closing

of the Agency, and that it was not fully adopted by the outgoing nor the incoming government, although some took the document as a guide (Interview 2, Pos. 10).

It was highlighted that the effort made by the Resilience Agency, which in fact, operated for less than a year, could not take off:

“...for a long time, we worked as, well, as a ghost within the organisational system of the city for about six months and six months we were able to do as much as we could” (Interview 1, Pos. 56).

The delays and the time it took for the planning of the Strategy meant it started being implemented almost at the end of the last government administration⁴²—which, as indicated before, showed a significant engagement with the initiative, opposite to the current one—an event that also overlapped with the termination of 100RC and its detachment from the Rockefeller Foundation. An expert suggests that more time would have allowed modifying the legal framework of the Agency’s creation and hence more feasibility to implement the Strategy (Interview 3, Pos. 20). To add, the Strategy was released only a few days before the 2017 earthquake; in this sense, the government’s priorities radically changed after that, focusing more strongly on “reacting to the emergency than on orderly planning, foresight, prevention and adaptation” (Interview 3, Pos. 21).

2.1.3 Monitoring/Tracking progress

Up to this date, there has been no system in place to monitor and track the progress of the Strategy and its actions. It has been suggested that while actions channelled for resilience are being carried out by different ministries, it is very difficult to whether attribute certain resilience actions to the Strategy or not. An expert claims that there is no evidence for this and some actors and ministries might not want to acknowledge that certain actions were implemented because of the Strategy (for example, SEDEMA’s rainwater harvesting programme for Iztapalapa) (Interview 2, Pos. 41). The absence of a monitoring system represents an obstacle to effectively measure the success of actions proposed in the Strategy. In fact, interviews revealed that few specific activities from the Strategy were mentioned.

⁴² The Strategy was created in 2015, with the last edition finished in 2016, but appeared in the Official Gazette only in February 2018.

2.1.4 Governance

Achieving interministerial coordination proved challenging, both in aligning a shared vision for the Resilience Strategy in a comprehensive way—without stepping on each other’s attributions—and in maintaining ongoing coordination during its implementation. Similarly, with a wide range of stakeholders representing different sectors, it proved hard to decide where to focus efforts, what to prioritise, what is more strategic, and where there is more opportunity to have an impact, especially in a city that faces multiple risks.

An expert mentioned that getting everyone involved during the design of the Strategy, which required the participation of several actors, was the biggest challenge; this meant making participants interested and that they acknowledged the benefit of it, as well as transmitting the message that “prevention and adaptation were prioritised over reaction” (Interview 3, Pos. 52).

Experts acknowledged that it was challenging to make the Resilience Strategy to have an integrated vision of both actions and future directions, and, while it could be difficult for a single document such as the Strategy to dictate city-wide initiatives, it should present a unified vision and strategic approach along with other documents aimed at building resilience.

Another major obstacle was making resilience building an institutional process, one which is built by mandate, independently of political will or personal interests. As an expert points out: *“[resilience] should not be at the mercy of whoever is in power and the team they bring”* (Interview 4, Pos. 43).

Moreover, participating in 100RC represented the first effort to try to really understand what is meant by “resilience”, and the first time it became part of the public agenda in Mexico City. Introducing the concept, raising awareness, defining it and, most importantly, applying it into the context of a city was both unprecedented and challenging.

2.2 Positive feedback

This section contains positive elements observed by the interviewees regarding the city’s participation in 100RC. These aspects include statements related to key aspects such as: (a) joining a global network; (b) support provided, and; the degree of (c) institutionalisation of resilience that came as a result. Additionally, this segment compiles feedback regarding the resulting Resilience Strategy, as well as its design process.

2.2.1 Key elements

a. Joining a global network

Experts agreed that the opportunity to join a global network had certainly a positive impact in Mexico City's resilience building. It was highlighted that the learning networks generated between the cities was key to move forward, and that these urban global platforms helped generate pressure on the government administration to move towards where cities should go. Joining a global network deemed important in order to have a "common global agenda", and "even if it is by peer pressure, it is positive that cities organise themselves on this scale" (Interview 3, Pos. 48).

Joining the global network also seemed to have left a legacy given that after the Agency and 100RC, the now Directorate General for Resilience (DGR), continued the work through their global partnership with R-cities. Moreover, there are currently global summits every 2-3 years with all Chief Resilience Officers as part of the Resilient Cities Network.

b. Support provided

In terms of the Strategy—the tangible result of 100RC—it has been suggested that thanks to the support of 100RC, "a very good Strategy was generated, with clear lines of action that encompass the city's tensions and impacts" (Interview 1, Pos. 25), and, "had the resources not been provided, it would have not existed" (Interview 4, Pos. 55).

The openness of the methodology for the planning process was positively highlighted; although the same guidelines applied to other 100RC cities, each city had its own priorities and had the freedom to design their Strategy accordingly. As noted, the participatory, "hands-on" methodology was "one of the greatest contributions of 100RC" (Interview 3, Pos. 62).

Moreover, 100RC contributed not only with money but with support from different partners for consultancy to provide the Agency with the tools for better coordination. The advice from 100RC's key partners was also considered to be of significant help. The methodology for the design of the Strategy with the support provided by for example, AECOM and Arup, as key consultants, for the structure and framework, was defined as "extremely valuable" and "useful" (Interview 3, Pos. 29). The platform of partners served as a hook to contract additional services which were well

structured and thanks to this, “the quick results were one of the greatest added values to the initiative” (Interview 3, Pos. 41).

Some projects were mentioned as a result of the funds provided by 100RC:

- Study conducted by Deltares⁴³ on the Xochimilco heritage zone, to address the problem of the ecological impact on the area and the wetlands.
- Report “Learning from the Earthquake to be More Resilient”, after the 2017 earthquake.
- Inputs and support by Bain⁴⁴ in the planning process after the 2017 earthquake.
- Funding for other projects and promotion of the resilience of the city, many with an environmental approach.

The City Resilience Framework provided by 100RC (developed by Arup with support from the Rockefeller Foundation), and the capacity it generated to identify actors served as a guide for the Resilience Agency. Although 100RC did not provide measurement tools, it provided the methodology to build indicators thanks to this framework, which also helped conduct a mapping of existing actions in the beginning of the design of the Strategy (Interview 4, Pos. 35); AECOM for instance, helped structure the Strategy. Moreover, 100RC’s engagement encouraged the Head of Government, as well as the city and local authorities, to take action on the cause by raising the issue and encouraging stakeholders to participate and implement solutions. An expert states:

“Commitment with a resource from 100RC with the Mexico City government made the concept of resilience known, and made many actors genuinely interested in what resilience implied for their operation, there was progress in that” (Interview 3, Pos. 56).

Although the closure of 100RC did seem to have some effect in the sense that support was reduced, the framework, the Resilience Agency, the Strategy, and the CRO figure, all laid the groundwork for an important urban resilience transition.

⁴³ 100RC partners

⁴⁴ Ibid.

c. Resulting Institutionalisation

The institutionalisation of resilience is seen as a goal and a critical component of 100RC and CDMX's participation. Besides categorising 100RC as "a rather unique initiative as public policy creation" (Interview 3, Pos. 67); in general, interviewees indicated the existence of some degree of institutionalisation as a result of the efforts made such as the creation of the Resilience Agency and the Strategy, which they considered a success of the overall participation. An expert mentions: *"beyond publishing a beautiful document with the best strategies and proposals for these cities, for me it is like a gain that this institutional framework exists"* (Interview 4, Pos 46).

The success in the institutionalisation of resilience and resilience actions is illustrated by the creation of an area for Resilience within the Mexico City government; first with the Agency, and now within a Secretariat (SGIRPC). It was acknowledged that the Resilience Agency played a key role in institutionalising the term *resilience* and succeeded in making the concept more widely used in the public agenda and to remain in some institutions. *Resilience* can now be found in the Mexico City Development Plan, the Political Constitution of Mexico City, as well as in Mexico City's Integral Risk Management Law (Interview 2, Pos. 25). Similarly, the Strategy is published in the Official Gazette of Mexico City, which means it has a level of public policy.

The fact that resilience and resilience actions have an institutional framework and that they are part of the government programme is considered a success and a result of the evolution of the work that was started.

2.2.2 The Strategy

"If you can make a Resilience Strategy in a city as monstrous, as big, as full of risks, as complex as Mexico City, you can do it anywhere" (Interview 3, Pos. 6).

The Strategy received positive feedback in terms of the design, arguing that the document was very well structured, with good projects, and that the issues selected were correctly prioritised (Interview 1, Pos. 6; Interview 4, Pos. 19). An expert highlighted the Strategy's pillar of Metropolitan Coordination, which he/she considered of special importance, arguing that the problems of the city go beyond its political limits (Interview 4, Pos. 19). Although not perfect and with some things to elaborate on, the Strategy was believed to provide good tools and resources. The Strategy is seen as a "lens" to achieve a comprehensive vision of the city's objectives towards

resilience, or as a roadmap where stakeholders took it as a point of reference (Interview 4, Pos. 51; Interview 2, Pos. 10).

Another interesting insight showed that Mexico City was one of the cities that had the biggest amount of staff developing the Strategy, this in comparison to other cities in the program; although the reasons for this are unknown, it could be implied that it was due to the complexity of the city, or the level of salaries versus other cities, among others.

2.2.3 The role of the Resilience Agency in the Strategy's design and participatory process

The design of the Strategy, based on the methodology provided by 100RC, entailed a participatory process and intersectoral cooperation through workshops conducted by Mexico City's resilience office, the Resilience Agency. The involvement of civil society, Academia, private sector and government was reiterated by the interviewees.

Several workshops were implemented by the Agency for the design of the Strategy and its lines of action, in which representatives of different government entities participated, and collective planning sessions led to the development of specific initiatives, which were prioritised based on interest and on the secretariats' priorities. Each axis of the Strategy had a key actor from each ministry to select priority actions. In this way, the Strategy helped put forward each ministry's priorities. Certainly, a different degree of involvement was observed during the collective sessions, it was a participatory process in which in some cases some actors or entities were more engaged than others (Interview 3, Pos. 30).

Organisations working within specific sectors were contacted; for example, there were meetings with Waze, Uber, bicycle enterprises for mobility issues, other companies and civil society organisations for water issues, and others. The Agency's overall goal was to create a shared space to address issues of relevance for the cities, where civil society, Academia (such as UNAM⁴⁵, UAM⁴⁶), businesses, research centres and government were involved, whose efforts in fact helped the Strategy and its actions move forward (Interview 3, Pos. 34-35). Additionally, there were workshops implemented with specialists in resilience, climate adaptation and urban planning that contributed to the creation of the major transformation indicators created by the Resilience Agency, but which were not used or further developed after the closure of the office and 100RC.

⁴⁵ Mexico National Autonomous University

⁴⁶ Metropolitan Autonomous University

The Agency functioned as an umbrella organisation and receptive body which coordinated institutions and integrated efforts. Examples such as Mexican Satellites (SATMEX) and UNAM for geological issues or earthquakes, the Polytechnic National Institute (IPN) for water, transport, etc., as well as other agencies in CDMX, in other municipalities and in other states (Interview 1, Pos. 26).

One of the Agency's objectives when inviting as many relevant stakeholders as possible to participate in the design of the Strategy, was for these actors to claim some *ownership* in the process (Interview 3, Pos. 29). In this sense, it can be observed that the interaction of other actors in the process was successfully achieved, and the multi-actor participation and coordination was accomplished by the Resilience Agency.

2.3 Measurement tools

The existence of measurement tools makes an important aspect of the research, since these aim at monitoring, assessing the effectiveness and keeping track of the progress of implementation, they are representative of the progress and also indicate a meaningful part of the commitment from 100RC with the cities.

As mentioned before, the City Resilience Framework did not provide a measurement tool to estimate the impact and progress of the actions outlined in the Strategy, but it did provide the methodology to build these indicators. For this, the Agency carried out workshops for the construction of indicators for short, medium and long term, depending on the timeframe.

With the support of the work between 100RC and Arup and SIWI^{47 48}, the Agency generated tailored-made indicators. These indicators consisted of 3 phases: status indicators, efficiency indicators—to demonstrate whether there's been progress made in the different programmes that are linked to the activities proposed in the Resilience Strategy—and transformation indicators, which would be the most significant ones (Interview 1, Pos. 15). Additionally, it was mentioned that the City Resilience Framework helped the Agency conduct a mapping of existing actions.

⁴⁷ 100RC worked with Arup and SIWI to generate this type of tool. According to the expert, these companies were going to be the first ones to develop a resilience assessment framework of this kind in Latin America; it was an assessment framework to help them understand how to generate indicators, develop monitoring and follow-up reports in the future (Interview 1, Pos. 11-12).

⁴⁸ SIWI - Stockholm International Water Institute

The Agency was very clear about the creation of these measurement tools because they wanted to deliver not only commitment to the progress, but also reporting capacity for the institutions that would be in charge of each of the actions (Interview 3, Pos. 43).

7.4.3. CDMX POST-100RC

From the closing of 100RC in 2019 to the present day (2023), this section provides insights into the aftermath of the city's involvement in the program, its current position and where it is headed in its resilience journey. It explores the city's current position, the aftermath of its participation and its path in resilience-building. To evaluate part of the legacy of 100RC, this section assesses the impact of the initiative in CDMX, the efforts made, the progress achieved in terms of resilience actions, as well as persistent obstacles and challenges to a resilience transition.

3.1 Impact

Exploring the legacy of CDMX's participation in the initiative entails understanding its impact and assessing whether it continues to influence the city's resilience journey in any certain ways, and thus to measure the significance of the city's participation against the arguments presented here. As such, this section stands out as a critical component when discussing the legacy of 100RC in the analysis.

Mexico City's participation in the initiative significantly influenced the **evolution of urban resilience understanding**, as demonstrated by the following statements:

- *"[the initiative] brought together willingness [...] that in the past had not been achieved to try to understand a subject, which we can say in the public agenda was quite new and that in principle it was necessary to explain directly what was meant by resilience"* (Interview 1, Pos. 24).
- *"...commitment with a resource from 100RC with the Mexico City government **made the concept of resilience known**, and made many actors genuinely interested in what resilience implied for their operation"* (Interview 3, Pos. 56).
- *"...the concept of resilience permeates and that is because we inherited it from the Agency"* (Interview 2, Pos. 25).

- *“...the theme of resilience permeates in the Development Plan, in the Constitution of Mexico City [...], in our CDMX Integral Risk Management Law, there is the theme of resilience”* (Interview 2, Pos. 25).
- *“...despite the fact that it has been slower than expected, it has had a positive evolution; the first aspect is that the term is already in place”* (Interview 1, Pos. 49).

The participation also influenced positively in the way it generated **commitment and involvement from stakeholders**. It was noted substantial progress on 100RC’s aim to generate commitment from local governments, promoting implementation and urging stakeholders to address issues and formulate action plans. Experts also considered that nowadays there are more people invested in resilience and its role in urban planning, and that “although it may not be quantifiable, [and] it was not implemented to the extent that the initiative originally sought”, it generated commitment on the part of some actors to continue the work (Interview 3, Pos. 58).

The institutionalisation of the Strategy through the Resilience Agency and what today is the DGR has involved a number of people from diverse groups -namely Academia, civil society, students, companies, and other social groups-, into participating, as well involving into specific struggles that directly affect them, such as the issues with Xochimilco or the 2017 earthquake (Interview 1, Pos. 49). The work done has helped the concept of resilience become clearer to these diverse groups.

Another positive footprint 100RC left is the **institutionalisation of resilience**, not only based on the entities created, but also on the fact that the Resilience Strategy is published in the Official Gazette of Mexico City, which means it has a level of public policy. Similarly, the figure of a Chief Resilience Officer continues, according to an expert, which is now embodied by the Secretary of the SGIRPC.

The creation of the DGR, the continued work and the updating of the Strategy is considered positive progress. While updating the Strategy, the Council has made efforts joining actors to talk about resilience in the mobility system, climate change, adaptation, water, etc. This is the result of the initiative and the work done, the document created paved the way and serves as a basis for further and more comprehensive plans.

3.2 Obstacles

After 10 years of the start of 100RC and the subsequent implementation of the Resilience Strategy, there are obstacles that have hampered and likely continue to hamper the resilience path in CDMX. Once again, the political decisions and governance mechanisms play a key role in this case, coupled with the termination of the program. Most of the experts' opinions put great weight on the political turnover, which impacted negatively both during the time of the Agency and release of the Strategy and until these days.

With the change of government administration in the city in 2018, just one year before the closing of 100RC, the Agency and the Strategy had relatively little time to be executed as planned. As mentioned before, the Resilience Agency was closed during that time, and all its functions were transferred to the Directorate General for Resilience (DGR) within the SGIRPC. An expert says that due to these administrative changes, the visualisation that Mexico City had started to be lost: "political issues [...] how they changed the sense of what was understood by resilience as this holistic vision towards only a vision of risks and how to mitigate risks" (Interview 1, Pos. 29). This change of vision apparently also made the 100RC person responsible for LATAM to "move away" from the program.

This political change also meant "wiping out" the people who participated in the first part of the implementation and the institutionalisation of resilience, no longer being part of CDMX's resilience office. Moreover, it was highlighted a number of times by three of the experts that, in contrast to the government administration before 2018, resilience actions have not been a priority in the public agenda for the current head of government, and that the commitment to the program has not been sustained in the current administration. An expert suggests that the current government might view this kind of initiatives as foreign interventions (Interview 3, Pos. 50). In this sense, the will and government's vision could certainly have affected the engagement of different actors to the project.

Some experts suggested that with the actions now taken over by an entity within a CDMX ministry, the Agency's former role remained a step lower than what they had proposed initially. This fact is also believed to hinder the interaction required with other institutions; for instance, in bureaucratic terms, i.e., in order to establish a connection with another ministry, two more steps would have to be escalated. Hence it was suggested that the DGR is not a place for the Strategy and its actions.

An antagonist opinion however, stated that the DGR within the SGIRPC is a good place based on budgetary terms, as opposed to the Agency (Interview 4, Pos. 30).

Even though some may have considered the continuation of the work through a Directorate of Resilience a success, other opinions suggested that this entity is no longer a coordinating body, but an entity which is dependent on what the SGIRPC states, which is focused on risk and prevention. In this sense, an expert considers that the problem relies on the fact that each ministry is limited to certain issues, and then other related issues fall into the scope of other ministries (Interview 1, Pos. 32).

It was re-emphasised that the fact that 100RC was beginning to disassociate itself from the support provided to the cities near its termination, and the consequent closing itself, impacted the process. While the coordination among different Secretariats and sub-Secretariats is a challenging task, the responsibility that needs to be taken by an organism is not quite clear yet.

Another challenge It has been a constant work maintaining the global network, from 100RC to now R-cities and that the vision of urban resilience doesn't disappear, but in the end, it is the local government that gives the support for this to continue, to be implemented, and for a CRO figure to exist.

3.3 Areas for Improvement / Challenges

Events such as the COVID pandemic or the 2017 earthquake certainly challenged Mexico City's resilience capacities and put them to the test. An interesting observation was made in this regard; for an expert, the pandemic for Mexico City proved that adaptive capacities—which constitute one of the pillars of the Strategy⁴⁹—were not actually taken into practice:

“I do see that as a big step backwards, because that means that we are closed to thinking that Mexico City only has four problems in this case because nobody took into account the adaptive capacities” (Interview 1, Pos. 51).

The expert suggested an apparent lack of initiative in addressing these risks from the current resilience executive arm, the DGR. Moreover, it was emphasised that this type of events reminds

⁴⁹ Axis 5 “Develop innovation and adaptive capacity”

us that resilience actions and strategies should not be static and should be constantly reviewed and adapted: *“these types of exercises to understand the risks and where to place similar axes or resilience actions in a territory cannot be static and have to be constantly reviewed”* (Interview 1, Pos. 51).

On another note, it was suggested that there are still other possible tensions and impacts that don't seem to be understood yet and represent areas that need to be taken into account, for instance, informality (trade), health risks, cybernetic risks, and security (Interview 1, Pos. 52 & 53).

Enhancing intergovernmental cooperation is identified as another area to be addressed, as it remains unclear whether this is being effectively realised by the current administration for resilience. On top of that, having all involved actors in the same vision of what urban resilience means it's a challenge. Another continuous challenge raised is that of the effort to contextualise the term resilience into a system such as a city. (Interview 1, Pos. 35).

3.4 Resilience Actions- progress

There is some progress in terms of resilience actions that was highlighted by the interviewees. The actions mentioned here are somewhat difficult to link directly to the Strategy, in other words, it is hard to attribute these actions to it. An expert claims that, according to his/her experience, while there were particular resilience actions implemented by certain ministries, it was not necessarily because these were following the Strategy.

This section gives some insight into part of Mexico City's resilience path explained through some of the actions taken up according to the experts, however these could or could not be directly linked to the initiative. For instance, an expert says that Mobility was one of the ministries that did their own plan of actions “without taking the Strategy into account” (Interview 2, Pos. 11).

The area of Mobility, which constitutes one of the main Axis of the Resilience Strategy⁵⁰, represented the majority of the progress in resilience actions. An expert considers that mobility issues under the Secretariat of Mobility of the CDMX (SEMOVI) took an interesting step towards multimodality in public transport. Some positive advancements include:

⁵⁰ Axis 4 - *“Improve Mobility through an integrated, safe and sustainable system”*

- Gondolas are the new systems built in the south of Mexico, in an effort to connect the people living in far areas to the city.
- The subway and *metrobus* (bus rapid transit system) are being connected, a project of the current administration.
- Implementation and expansion of bicycles, trolleys, climate neutral, low-emission
- Expansion of metrobus networks, as well as cable buses.

Additionally, it was noted that the DGR is looking into an integral, one-single registration card to have access to all means of transport, an effort which apparently has failed in the past (Interview 1, Pos. 21). While substantial progress was raised, it was also suggested that SEMOVI was of the secretariats that created their own plan “*without taking the Strategy into account*” (Interview 2, Pos. 11).

Other positive actions include:

- Installation of rainwater harvesting systems⁵¹
- Indicators for air quality⁵² have worked well at the metropolitan level, however, these were created even before 100RC (2006).
- Earthquake early warning systems⁵³, have worked quite well, especially in the most affected areas.
- Expansion of green areas⁵⁴ (i.e. the addition of the fourth section as an Urban Park in the Chapultepec Forest.
- Inclusion of the municipalities from the State of Mexico⁵⁵; it was considered to have worked to a certain extent.

3.5 Resilience actions - stalled

Although interviewees did not go into detail on the resilience actions outlined on the Strategy, some important areas were mentioned in terms of little or no progress in the time from the release of the Strategy up to date. These are areas where attention is still needed according to the experts:

⁵¹ *ibid*

⁵² Action 1.2.2; does not correspond to a specific activity

⁵³ In reference to Activity 5.2.1.1

⁵⁴ Axis 3. Action 3.1.1. Not specified for Chapultepec but contributes to this action (“*Preserve, expand and recover green areas*”)

⁵⁵ Axis 1

- Adaptive capacities. Axis 5 of the Resilience Strategy, an expert suggests this was the most “unprotected” priority area (Interview 1, Pos. 35).
- Mobility. Although there have been improvements in the mobility area, the subway in Mexico City remains an urgent and often neglected matter, as it is collapsing day by day. It was pointed out that it needs to be addressed by the current administration and the upcoming ones.
- Monitoring. There is currently no system in place to be able to track the resilience transition in the city, including the actions outlined on the Strategy; an expert indicates: “...[Monitoring the progress] has been left in the limbo, no one wants to take that responsibility because it's a complicated task, [...], it would be a timely task to identify whether there is a transformation in Mexico City, even in the psyche of the citizen” (Interview 1, Pos. 38).
- Interinstitutional governance. According to an expert, it has not worked up to this day, especially to link the hot spots between Mexico City and surrounding cities in other states (i.e. Puebla, Pachuca, Cuernavaca, Toluca).
- Rainwater harvesting systems was an implemented action from the Strategy⁵⁶, as part of the Axis 2 on Water Resilience; according to previous studies conducted, these do not consist of further necessary capacities, for instance, they lack the capacity for distinction between grey and black water.

3.6 Further Developments post-100RC

According to the experts, certain developments following Mexico City’s participation in 100RC offer deeper insight into the initiative’s legacy and the city’s resilience journey. The initiative created a *movement*, and it continues, because there is a network of people who were involved at the time and are still involved both directly and indirectly, continuing the path towards resilience building. After 8 years since the Resilience Strategy was published, there are currently efforts carried out by the new resilience office, the SGIRPC’s DGR, to continue the transition and follow up on the work that started with 100RC. The DGR, since 2019, is the responsible body for the

⁵⁶ Specifically, Action 2.1, Activity 2.1.3.1

actions in the Strategy, and most importantly, it has been updating the Strategy since 2021, in an effort to keep the document alive and adapt to new circumstances. The DGR is also working to link the document to other schemes such as the Mexico City Land Use Plan and the Development Plan 2020-2040, two fundamental programs, with the aim of bringing visions in tune with each other (Interview 2, Pos. 15). The entity also created the Resilience Council of Mexico City in 2019, which has been working to mainstream the issue of risk management across the 19 ministries and decentralised bodies of CDMX (Interview 2, Pos. 27). This goes in line with what an expert suggests in the sense that the DGR should have a “transversal vision” and the power to integrate different programmes from different ministries so that all the actions taken are in accordance with risk and prevention (Interview 4, Pos. 38). Additionally, a sustained commitment and engagement can be seen in actively participating in the newly established global network that originated from 100RC and evolved into R-Cities, which now includes more participating cities.

CHAPTER 8. RESULTS & DISCUSSION

This chapter discusses the main findings of this study in relation to the research questions that guided it, existing literature, and theoretical framework. The purpose of this is to critically reflect on the legacy of the 100 Resilient Cities initiative in Mexico City after a decade, to assess how it shaped resilience building in the city, and to reflect on whether the initiative achieved new and durable forms of urban governance.

8.1 Introduction: The Legacy of 100RC in Mexico City

Revisiting the research questions of this study:

- **What is the legacy of the 100 Resilient Cities initiative in Mexico City, and to what extent has it contributed to shaping urban resilience governance and transformative change over the past decade?**
- How has urban resilience been understood and translated into Mexico City's policy and practice following 100RC?
- How did participation in 100RC influence resilience building efforts and local governance practices in CDMX?
- Did the 100RC Resilience Framework address the city's specific challenges?
- To what extent did the initiative enable adaptive and transformational change, and what gaps emerged between discourse and practical implementation?

The legacy of 100RC in Mexico City is a contested, paradoxical one. While the initiative successfully acted as a catalyst, through the introduction of new tools, language, cross-sectoral collaborations, and institutional structures, the extent to which this translated into a stable and enduring new governance model is debatable.

On the one hand, Mexico City's participation in 100RC led to the successful institutionalisation of urban resilience discourse and introduced urban governance innovations. The Resilience Strategy was published as a public policy tool and integrated into the city's Political Constitution, establishing its mandatory observance. We can reflect on findings by Pitidis & Coaffee (2020), who argue that resilience initiatives often succeed in reframing policy agendas and establishing new narratives in governance systems. While the Strategy delivered limited traceable outcomes, the city's participation in 100RC might have indirectly shaped its urban resilience trajectory. The

concept gained greater visibility, certain post-earthquake actions were explicitly derived from resilience framings, and sectoral programmes and constitutional reforms use some of the narrative and principles promoted during the initiative. It can be said that the initiative was successful in reframing how the city defined its long-term challenges and development goals. Similar to what has been observed in other cities, this demonstrates the ability of 100RC to influence local governance discourses (Montero, 2020).

On the other hand, its impact is undermined by a lack of continuity, monitoring, and accountability. First, linked to the limited traceable outcomes, the absence of a monitoring, reporting, and verification mechanism stands out as a fundamental limitation, making it extremely difficult to assess the impact of resilience actions and whether these at the same time created transformation at all levels. Second, the closure of the dedicated Resilience Agency only a few years after its creation and the downgrade of this figure reflected highly important limitations found in governance, namely, institutional inertia, political fragmentation, lack of a centralised authority, and eventually challenges to institutional coordination. These are some of the setbacks that can be identified in the Mexico City case as evidence of the fragility of such governance innovations.

The following sections examine this legacy in detail, considering how governance structures evolved, how resilience discourse was adopted, and where tangible or institutional impacts can be identified.

8.2 Contribution to Urban Resilience

Assessing whether 100 Resilient Cities contributed to building resilience in Mexico City is complex. Although the Resilience Strategy was formally adopted as a binding public policy instrument, its practical impact is difficult to measure. There is no monitoring mechanism or MRV tool in place to track the 121 activities provided by the Strategy or 100RC; there was a proposed MRV tool by the LANCIS-UNAM, but which never materialised as part of the Strategy since it is not existent today. Document analysis and interviews identified only a few specific actions that were explicitly directed to the Strategy, namely: the installation of rainwater catchment systems in houses with water scarcity, the expansion of the Ecobici system (cycling lanes), the expansion of green areas in the Chapultepec Forest, the expansion of structured public transportation network, and the promotion of electric mobility.

Indeed, several important resilience-related policies and programmes were developed in Mexico City during and after its participation in 100RC, but their direct connection to the Strategy remains ambiguous. They either preceded it, were developed independently by sectoral departments—following their individual development plans—or were only loosely connected to resilience as a guiding principle. For example, the Climate Action Plan Programme (PACCM) for 2014-2020, which preceded the Strategy but overlapped with CDMX's annexation to 100RC, already provided a framework for reducing environmental, social, and economic risks derived from climate change. Similarly, the Local Climate Strategy and subsequent Climate Action Programme set long-term objectives for low-carbon and resilient development, without explicit references to 100RC. The General Plan for Development (PGD) and the General Plan for Territorial Management (PGOT) (both 2023) also establish resilience-related priorities, but again, do not explicitly link them to the Strategy, although they could have been based on it.

This creates a major attribution problem. The lack of such an MRV tool or a tracking system of activities not only threatens the legitimacy of the Strategy, and the program overall, but it also makes it hard to assess the impact of these efforts and this new proposed governance approach. The Strategy did not provide a clear monitoring and evaluation mechanism that could track whether proposed actions were implemented or whether they produced the intended outcomes. These results agree with other findings in the Mexico City case (Torres-Lima et al., 2020; Rodríguez-Izquierdo et al., 2022), but also echoes findings from other 100RC cases, where strategies too lacked monitoring and evaluation tools (Galderisi et al. 2020; Fastiggi et al., 2021; Naef, 2022). As a result, it is significantly difficult to demonstrate a direct line between 100RC and measurable improvements in the city's resilience.

At the same time, the 2017 earthquake proved to be a turning point. In its aftermath, the Resilience Agency promoted the Law for the Reconstruction, Recovery and Transformation of Mexico City, explicitly framed around resilience to seismic risk, water and mobility. Collaboration with 100RC's Platform Partners in this period also reinforced the importance of resilience in disaster management agendas. This suggests that while the Strategy itself may not have been the direct driver, the city's involvement in 100RC shaped the policy discourse and provided concepts and tools that influenced responses to the earthquake.

Other initiatives point to a chain reaction effect. The city became part of the Resilient Cities Network initiative, joined the MCR2030 initiative, and gained recognition as a Resilience Hub.

As pointed out earlier, some ministries developed their sectoral development plans which include strategies that align with priorities outlined in the Strategy despite never mentioning 100RC. For instance, such is the case of the mobility programmes Plan Colibri in the State of Mexico 2023 and the CDMX Mobility Comprehensive Programme 2019-2024 (PIM), or the CDMX Climate Action Programme 2019-2024 (PACCM). These developments indicate that resilience building actions multiplied after CDMX joined 100RC, even if attributions to the Strategy remain unclear.

A significant milestone was Mexico City's Political Constitution of 2017 and its inclusion of the resilience term as part of the public agenda in areas such as environment and risk mitigation. Although the concept of resilience had appeared earlier in the city's climate agenda in 2012, its institutional importance grew significantly after the adoption of the Resilience Strategy in 2016 and the overall participation of the city in the initiative. The dialogues exchanged between relevant stakeholders during the time of 100RC may have influenced discussions during the city's climate strategy policymaking, and the Strategy may have contributed to the efforts from other ministries adapting their priorities.

By making “resilience” a discourse term at the political level, the initiative indeed helped shape agendas, influenced budgetary allocations (for example, the city's 10% budget committed into the Resilience Pledge), framed sectoral discussions, and encouraged intersectoral collaboration. Even if the projects cannot be directly attributed to the Strategy, the initiative shaped the context in which decisions were made. In this sense, its contribution lies less in the execution of specific projects and more in the diffusion of resilience as a guiding narrative for urban governance. This role of shaping discourse, even when the impacts are difficult to measure, has been emphasised by several scholars (Leitner et al., 2018; Tierney, 2015). While the Strategy delivered few traceable outcomes—at least direct outcomes—Mexico City's participation in 100RC indirectly shaped its resilience journey. Ultimately, 100RC's impact is found less in concrete outputs than in the institutional framing and gradual incorporation of resilience into the city's broader policy around urban resilience and sustainable development; indirect effects that, should not be underestimated.

8.3 Alignment between the 100RC Framework and Local Challenges

The 100 Resilience Framework aimed to provide cities with a comprehensive approach to resilience, however, its application to Mexico City revealed tensions between the global model and the local context. On the positive side, 100RC offered a well-structured and innovative way to view shocks and stresses, and the Strategy correctly prioritised the city's key urban challenges, including water scarcity, seismic risks, and mobility. Experts confirmed that the Strategy's design was strong, participatory, and well-structured, reflecting global best practices of inclusive urban planning. Its recognition of Metropolitan Coordination as one of the main pillars was particularly appropriate for a city located in a megalopolis.

However, the framework proved less capable of addressing persistent structural issues:

- Governance fragmentation and lack of interministerial coordination.
- Chronic infrastructure failures (e.g. subway system).
- Social inequalities and vulnerabilities, which amplify exposure to shocks.

This reflects a broader critique of resilience frameworks; while they excel at diagnosing and mobilising, they often struggle with political realities, institutional inertia, and rooted inequalities (Rodríguez-Izquierdo et al., 2022). Moreover, many proposed actions were too broad or idealistic, lacking the operational methods for implementation or resources, while others overlapped with existing initiatives. This reduced the Strategy's usefulness as a practical planning tool. On paper, the framework encouraged a holistic approach to urban resilience, but in practice, it proved difficult to adapt it to Mexico City's scale, governance complexity, and political realities. This resonates with another difficulty noted in the literature: bridging the gap between global resilience frameworks and the practical realities of complex urban governance (Torres-Lima et al., 2020; Zebrowski, 2020).

8.4 How Resilience was Understood and Communicated

One of the most enduring effects of 100RC in Mexico City has been the spread of resilience as a concept across different sectors of government and civil society. Resilience became a common language used in political speeches, policy documents, and inter-sectoral discussions. This shared terminology made it easier to frame diverse problems -such as mobility, climate adaptation, and disaster mitigation- under a single umbrella. This is consistent with arguments

that resilience functions as a “boundary concept”, in the sense that it is flexible enough to connect diverse agendas (Brand & Jax, 2007).

However, this diffusion also created ambiguity. For some stakeholders, resilience was understood mainly as a disaster management; for others, it represented sustainability, innovation, or social inclusion. The lack of a common definition allowed resilience to be politically flexible but also blurred its meaning. As a result, while the term gained visibility, it did not always translate into coordinated or measurable action. This, for instance, reaffirms Naef’s (2022) and Zebrowski’s (2020) broader critiques of resilience governance as more symbolic than transformative.

8.5 Governance Innovations and Setbacks

A central question in this research was whether 100RC promoted new ways of urban governance. One of the clearest innovations was the creation of the Resilience Agency, a semi-autonomous body, and the creation and appointment of a Chief Resilience Officer, a figure that had no precedent in the city’s governance structure. For some time, the Agency represented a new governance model, one that differed from the traditional top-bottom approach practiced in Mexico City. It enabled cross-sectoral participation and collaboration, multistakeholder approaches, and multilevel and networked governance. Through a series of workshops, working sessions, national and international collaborative forums, stakeholders from multiple levels of governance and sectors were engaged, particularly during the development of the Strategy. The Agency also provided international visibility and acted as a bridge to partnerships between public, private, academic and civil society organisations. These processes reflect the experimentalist governance model proposed by 100RC. In this sense, the Agency not only coordinated the implementation of the Strategy but also became the clearest institutional expression of CDMX’s engagement with the initiative, and to a certain extent, the portrait of its legacy.

The “deeply or long lived” bureaucratic and administrative barriers seemed to blur as a result of the influence of a foreign body, with strong influence capacity, and the funding provided, which also aided the eagerness for the relevant stakeholders to follow the proposed model.

Nevertheless, these innovations did not last long. Only one and a half years after the creation of the Resilience Agency and after the release of the Strategy, the closure of the office marked a significant setback while also illustrated the political vulnerability of resilience governance. When

the Agency was restructured from a decentralised body of the Secretariat of Environment into a department -the Directorate of Resilience- within another secretariat, its authority weakened. This change added new bureaucratic levels, while priorities shifted from environmental resilience towards risk management and disaster mitigation, likely changing the city's perspective and priorities for resilience building. The transfer of responsibilities to a subordinate office within a ministry added administrative and bureaucratic obstacles and this can cause, overtime, strategic goals to become subject to political and budgetary pressures, exactly what resilience strategies should aim to overcome. Until now, the Directorate's role and continuity depend on federal budget allocations to the SGIRPC, in contrast to the dedicated funding previously provided by 100RC. Half of the experts interviewed agreed with the fact that the position of the resilience office was downgraded. Furthermore, it was observed a lack of commitment to the project by the government administration that followed in 2018. In this sense, it can be said that the Strategy lost visibility and continuity. Political transitions played a decisive role; once mayoral priorities shifted, the resources and attention that had initially supported urban resilience declined. Referencing Rodríguez-Izquierdo and others (2022), resilience initiatives are particularly vulnerable to shifts in local political priorities.

Nevertheless, the creation of the Resilience Council within the new Directorate and the continuation of efforts since 2019 demonstrate that while governance structures were altered, they did not collapse entirely. At the time of the interviews conducted, the Strategy was being revised by the Resilience Council and an updated version was being developed. Moreover, the participation of Mexico City in international networks like R-Cities suggests that the city is still committed to the learning community.

The vulnerability of this institutional experiment provides a broader lesson; governance innovations require strong and enduring political will as well as solid establishment, and with it, long-term resources to survive government transitions. The fragility of these initiatives has been pointed out in related literature, referencing similar setbacks in other cities where resilience offices depend heavily on external funding and/or mayoral support (Galderisi et al., 2020).

8.6 Critical Reflections of the 100RC Model

The case of Mexico City also exposes the limitations of global resilience initiatives when they overlook political realities and governance obstacles. Scholars have warned that programmes like

100RC may reinforce neoliberal agendas, favouring private actors, standardised solutions and technical solutions while ignoring structural inequalities (Torres-Lima et al., 2020; Naef, 2022).

While 100RC sought to introduce innovative governance models, its framework also encouraged a one-size-fits-all logic that prioritised technical and universally accepted risks such as earthquakes and climate change, while overlooking deeper urban injustices, including inequality, informality, violence, and corruption, all challenges relevant to Mexico City. Issues that are central to justice, such as marginalised communities' participation, the gap between wealthier and more vulnerable areas, water access conflicts, and gendered inequalities, received no clear focus.

Additionally, by relying heavily on consulting firms, the Platform Partners, in this case, gained influence over how resilience was defined and operationalised. Still, it is also important to acknowledge the deep benefits. External involvement can provide a counterweight to domestic political inertia, encourage transparency, and accelerate action, especially in places marked by corruption or limited institutional capacity. Soft power from international networks can sometimes pressure governments to prioritise sustainability in ways they would not otherwise pursue. Yet, such influence raises concerns about sovereignty and about who ultimately shapes the future of cities: public interest, or private expertise? Mexico and Latin America have long histories of externally financed development programmes, and resilience initiatives must avoid reproducing profit-driven interests.

8.7 Theoretical Implications for Urban Resilience Governance

Despite limitations, the case of Mexico City offers broader insights for understanding the role of global urban resilience initiatives. It highlights the potential of programmes like 100RC to introduce new narratives, tools, and institutions into urban governance. The integration of resilience into constitutional and policy frameworks demonstrates the power of such initiatives to shape discourse and institutional priorities. At the same time, this case study highlights the fragility of external initiatives. Without long-term political commitment, funding, and clear accountability mechanisms, urban resilience risks becoming a short-lived popular term rather than a sustained governance practice.

This duality relates to critiques of philanthrocapitalism and global governance platforms, which can set agendas but may establish neoliberal ideologies and dependence on external actors (Leitner et al., 2018; Fitzgibbons & Mitchell, 2019).

From a theoretical perspective, Mexico City's case highlights key tensions in resilience governance:

- SES theory indicates that resilience requires feedback mechanisms; without MRV tools, the system cannot learn or adapt effectively. It can also be concluded that the Resilience Strategy resulting from the city's participation in 100RC, successfully visualises the city as a Complex Adaptive System (CAS), as it integrates actions and diverse stakeholders, and identifies impacts and tensions of social, economic and environmental nature, although in differing degrees.
- CAS theory suggests that resilience emerges from distributed interactions, not top-down strategies. In Mexico City, indirect influences -dialogues, networks, workshops- may have been more impactful than formal projects.
- Urban resilience literature emphasises multi-scalar governance. Mexico City's metropolitan context illustrates the difficulty of aligning across jurisdictions.
- Urban governance theory highlights the importance of institutional stability. The closure of the Resilience Agency shows how fragile governance innovations can be under shifting political administrations.
- From an Experimentalist Governance perspective, the process of development of the Strategy illustrates the "learning by doing", networked governance, and multi and intra sectoral approach described in the literature (Sabel & Zeitlin, 2011; Nguyen & Davidson, 2023).

8.8 Limitations of this Study

While this research offers an in-depth understanding of how the 100 Resilient Cities initiative shaped urban resilience governance in Mexico City, several limitations must be acknowledged. Rather than decreasing the value of the findings, these limitations highlight the complexity of assessing resilience building processes in challenging and evolving governance and political contexts.

First, the coexistence of multiple sustainable development and climate governance initiatives in Mexico City made it almost impossible to establish clear causal links between specific outcomes and the 100RC initiative. As these local efforts -such as the Climate Action Plan, the Mobility Programme, the General Plan for Development, etc.- overlapped in time and scope, it was very difficult to differentiate and attribute which developments or policy outcomes to which initiatives.

Second, the study was constrained by data availability. The lack of a dedicated monitoring mechanisms for the 121 actions proposed in the Resilience Strategy, aligned with inconsistent public reporting, limited the ability to evaluate the implementation progress and measurable outcomes. This also added to the problem of attribution described above. Moreover, the access to official documents was affected by the administrative restructuring, particularly the transition from the Resilience Agency to the Directorate of Resilience, which further complicated the documentation of governance changes.

Third, the conceptual ambiguity of *urban resilience* itself presented analytical challenges. As previously noted, resilience functions as a boundary concept -flexible enough to unite agendas, but at the same time vague to guide concrete action-. This complicated attempts to assess the exact extent to which *resilience* was translated into governance practice or policy impact in CDMX.

Fourth, in terms of temporal scope, this study focuses on the period of 2013 to 2023, without addressing specific long-term outcomes. As resilience building is a long-term and evolving process, this analysis captures only a phase of the city's trajectory -ten years after joining 100RC- and may not reflect future institutional developments.

Finally, as detailed on an earlier chapter of this thesis, there were some methodological limitations. The expert interviews comprised a small number of individuals; contrary to non-expert interviews with a larger sample size, in which a general survey is usually conducted, and in which the findings can be generalised to a broader population. As experts in the field, their insights are commonly accepted and can effectively address aspects of public policy and urban resilience, however their views may differ from those of non-experts. Finding suitable interviewees was also challenging due to institutional changes, geographical locations and time differences (Austria-Mexico), and limited availability. While anonymity was ensured to establish rapport, it did not entirely prevent interviewees from restraining themselves or holding back certain details given the

positions they may hold. Having pointed out the limitations however, conducting expert interviews proved significantly satisfactory for this research. Not only did these experts participate directly in the case study, but the sample was carefully and purposely selected to gain different views. Experts held different roles during 100RC and are now exercising in Academia, government and private sector. As such, besides providing sufficient information for the research, the expert sample offered a fairly broad spectrum with different perspectives, enriching the study findings. More detailed explanation of these limitations is provided in the Methodology chapter.

Chapter 9. Conclusion

This thesis examined whether the 100 Resilient Cities initiative influenced the understanding and governance of urban resilience in Mexico City. Through document analysis and expert interviews, it explored how a global framework was translated into local practice and what has remained of its influence a decade later. The study also reflected on the broader implications of introducing new global urban governance models into complex urban contexts.

The findings reveal a paradoxical legacy. Urban resilience has gained visibility in the city's policy discourse and planning practices. The creation of the Resilience Agency and the inclusion of the Resilience Strategy into Mexico City's Political Constitution are the most notable achievements. Yet the institutional foundations supporting urban resilience remain weak. The initiative's most 'enduring' contributions lie not in measurable outcomes, but rather in the narratives it helped promote, the tools it introduced, and the cross-sector collaborations it fostered.

Nevertheless, this legacy is constrained by governance issues. As highlighted by Torres-Lima et al. (2020) and Naef (2022), global urban resilience programmes run the risk of becoming symbolic rather than transformative unless they are supported by enduring public institutions, political commitment, and accountability structures. Mexico City illustrates this tension; the Resilience Agency, was unable to survive changing political administrations and hence political priorities, as well as funding dependencies, showing how these shifts can interrupt progress and weaken momentum for transformation.

This research also reaffirms critical perspectives on global resilience agendas. The flexibility of the 100RC model helped circulate the concept globally, but it also encouraged a one-size-fits-all approach that prioritised technical and universally accepted risks such as earthquakes, climate change, and infrastructure, while overlooking deeper urban injustices in Mexico City including inequality, informality, violence, and corruption. As noted by Fitzgibbons & Mitchell (2019), such omissions risk excluding the very populations resilience claims to protect. In the case of CDMX, although diverse stakeholders participated, marginalised groups did not meaningfully shape the process.

Power dynamics played a crucial role that must be emphasised. The influence of philanthropic and private actors on defining what resilience is and for whom shaped priorities in ways aligned

with technical-driven solutions and market-friendly interventions (Naef, 2022; Zebrowski, 2020). Topics related to the expertise are of the consulting firms i.e. Platform Partners, gained prominence, while actions targeting political structures, governance transparency or accountability received little attention. Moreover, it is difficult to conclude that both the initiative and the resulting strategy were successful without monitoring mechanisms in place, to both track progress and accountability. What is public policy without this? This is why these types of initiatives are called into question, often leading scholars to doubt their success and, on the contrary, to label them as mere instruments promoting neoliberalism.

Despite these deficiencies, the study reaffirms why urban resilience matters. In an increasingly interconnected world, the shocks and stresses experienced in one city can impact beyond its boundaries. Urban resilience strategies must not only reduce exposure to hazards but also challenge and transform governance systems that harm equitable and sustainable development.

Ultimately, the case of Mexico City demonstrates both the promise and the limits of global urban resilience initiatives. Building urban resilience requires more than innovative frameworks, it depends on sustained political will, adequate financial resources, monitoring and accountability, the active participation of vulnerable communities, and most importantly, the ability to adapt global ideas to local realities.

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Appendix

Appendix A: Interview Overview

Interviewee	Location	Mode	Date
Interviewee 1	Mexico City	Online	Sept. 7, 2023
Interviewee 2	Mexico City	Online	Sept. 8, 2023
Interviewee 3	Mexico City	Online	Sept. 12, 2023
Interviewee 4	Mexico City	Online	Nov. 27, 2023

Appendix B: Plain Language Statement (English translation)

Plain Language Statement / Participant Information Sheet

Research project:

Master's thesis "**Governing Urban Resilience in Mexico City: From Strategy to Practice in the 100 Resilient Cities Initiative**"

Introduction:

Thank you for your interest in taking part in this research project. In this document, you will find information about the project and how your valuable experience will contribute to it. Please take the time to read this information carefully and do not hesitate to ask questions if anything is unclear or if you would like further information. Your participation is voluntary; if you change your mind and decide not to take part, please let me know by email.

What is the research about?

The cities of today face serious challenges to cope with geographic, socio-economic and climate change impacts, and the lack of efficient urban planning can be a risk factor for disasters. Naturally, in recent years, the role of urban resilience and the search for ways to manage hazards and urban development have attracted significant attention, which has triggered a series of efforts and initiatives worldwide. However, questions have been raised as to the extent to which these initiatives have had, and continue to have, an impact on resilient transitions in cities.

One such initiative is the 100 Resilient Cities initiative (100RC), launched by the Rockefeller Foundation in 2013, with the aim of supporting cities worldwide to become more resilient to physical, economic, and social crises.

The purpose of this qualitative interview is to understand Mexico City's journey towards resilience since it joined 100RC in 2013. It is aimed at experts involved in Mexico City's participation in 100RC and in building resilience in the city through 100RC, and/or in the process of designing and implementing Mexico City's Resilience Strategy, including government officials, academics and civil society representatives.

What will I be asked to do?

You are invited to a one-to-one interview lasting approximately 30-45 minutes. This interview will be audio-recorded to allow for subsequent transcription and analysis. During the interview, you will be asked a wide range of questions; first regarding your role in Mexico City's participation in 100RC and your views on urban resilience in the city. You will also be asked more specific questions about the Mexico City Resilience Strategy, results, actions, achievements, opportunities, and challenges. In addition, the interview will cover governance and cross-sectoral cooperation process that have emerged from this initiative, as well as the resilience landscape in Mexico City following 100RC.

What are the potential risks?

There are no potential risks identified in participating in this research. All participant information will be kept confidential, and all data from the transcriptions of the audio recordings, as well as

any subsequent notes, will be anonymised. As a participant, you may withdraw from this research at any time; should you wish to do so, your decision will be respected.

What are the potential benefits?

The study will contribute to the field of urban resilience and to our understanding of how such initiatives contribute to a resilient transition in cities, using Mexico City as a case study, and how they can be improved. The findings of this study may not only provide valuable insights and lessons for the case study area, but also on how to shape governance structures and policies.

Will I be informed of the results of this project?

If you would like to be notified of the results of this research project or any subsequent publications, please let me or my supervisor know. Should the results of this research be published in an academic journal, you will also be provided with a link to the publication via email.

What will happen with the information about me?

After being collected, all information will be stored on a password-protected computer. It is reiterated that, all information will be anonymised to ensure your participation remains anonymous.

Who can I contact for further information?

For further information, please contact the researcher and author of the thesis and/or the supervisor.

Appendix C: Plain language statement (Original Spanish)

Declaración en Lenguaje Sencillo/ Hoja de información del participante

Proyecto de investigación:

Tesis de maestría “Gobernando la Resiliencia Urbana en la Ciudad de México: De la Estrategia a la Práctica en la iniciativa 100 Ciudades Resilientes” (originalmente en inglés: “*Governing Urban Resilience in Mexico City: From Strategy to Practice in the 100 Resilient Cities Initiative*”)

Introducción:

Gracias por su interés en participar en este proyecto de investigación. En este documento encontrará información sobre el proyecto y cómo su valiosa experiencia contribuirá al mismo. Por favor tómese el tiempo para leer esta información detenidamente y no dude en hacer preguntas si no ha entendido algo o le gustaría saber más. Su participación es voluntaria. Si cambia de opinión y no desea participar, hágamelo saber brevemente por correo electrónico.

¿De qué se trata la investigación?

Las ciudades de hoy enfrentan serios desafíos para hacer frente a las tensiones y shocks del cambio climático, de naturaleza geográfica y socioeconómica, y la falta de una planificación urbana eficiente puede ser un factor de riesgo de desastres. Naturalmente, en los últimos años el papel de la resiliencia urbana y la búsqueda de formas de gestionar los peligros y el desarrollo urbano han atraído una atención significativa, lo que ha puesto en marcha una serie de esfuerzos e iniciativas a nivel mundial. Sin embargo, se ha cuestionado en qué medida estas iniciativas han tenido y siguen teniendo un impacto en las transiciones resilientes en las ciudades.

Una de estas acciones es la iniciativa 100 Ciudades Resilientes (100RC) creada por la Fundación Rockefeller en 2013, con el objetivo de apoyar a las ciudades a nivel mundial para que sean más resilientes a las crisis físicas, económicas y sociales.

El propósito de esta entrevista cualitativa es comprender la trayectoria de resiliencia de la Ciudad de México a partir de su adhesión a la iniciativa 100RC en 2013. Está dirigida a expertos involucrados en la participación de la CDMX en 100RC y en la construcción de resiliencia en la ciudad a partir de 100RC, y/o en el proceso de diseño e implementación de la Estrategia de Resiliencia de la Ciudad de México, incluidos funcionarios gubernamentales, académicos y la sociedad civil.

¿Qué se me pedirá hacer?

Está invitado a una entrevista uno a uno de aproximadamente 30-45 minutos. Esta entrevista será grabada en audio para permitir su posterior transcripción y análisis. Durante la entrevista, se le hará una amplia serie de preguntas, primero, acerca de su papel en la participación de la CDMX en 100RC y su punto de vista sobre la resiliencia urbana en la ciudad. Enseguida, se harán preguntas más específicas acerca de la Estrategia de Resiliencia de la CDMX, así como resultados, acciones, logros, oportunidades y desafíos. Asimismo, la entrevista abordará el tema del proceso de gobernanza y cooperación intersectorial que se llevó y se ha llevado a cabo a raíz de esta iniciativa, y el escenario de resiliencia en la CDMX después de 100RC.

¿Cuáles son los posibles riesgos?

No hay riesgos potenciales identificados por participar en esta investigación. Toda la información de los participantes se mantendrá confidencial y todos los datos de las transcripciones de las grabaciones de audio, así como las notas posteriores, se anonimizarán. Como participante, puede retirarse de tomar parte en esta investigación en cualquier momento; si así lo desea, se respetará su decisión.

¿Cuáles son los posibles beneficios?

El estudio aportará al estudio de resiliencia urbana y al entendimiento de cómo este tipo de iniciativas contribuyen a la transición resiliente en ciudades utilizando el caso de la Ciudad de México y de qué forma pueden mejorarse. Los hallazgos de este estudio pueden no solo proporcionar conocimientos y aprendizajes valiosos para el área de estudio de caso, sino también sobre cómo dar forma a las estructuras y políticas de gobernanza.

¿Me enteraré de los resultados de este proyecto?

Si desea recibir una notificación sobre los resultados de esta investigación o de cualquier publicación posterior, infórmenos a mí o a mi supervisor. En caso de que los resultados de mi investigación se publiquen en una revista académica, también se le proporcionará el enlace de la publicación por correo electrónico.

¿Qué pasará con la información sobre mí?

Después de su recopilación inicial, toda la información se almacenará en una computadora protegida con contraseña. Se reitera que, toda la información se anonimizará para mantener su participación en el anonimato.

¿A quién puedo contactar para obtener más información?

Para más información, favor de contactar a la investigadora y autora de la tesis y/o al supervisor.

Appendix D: Interview Guide (English translation)

Interview Guide

Thank you for your participation in this qualitative interview for data collection for the research project. The purpose of this interview is to understand Mexico City's resilience journey from its participation into the 100 Resilient Cities initiative. It is targeted at experts involved in the design and implementation process of Mexico City's Resilience Strategy, including government officials, academics and civil society.

The questions are aimed at acknowledging how urban resilience is understood as a result of 100RC, and at understanding how the initiative and the resulting Strategy have impacted the city's resilient transition by exploring achievements, opportunities and the governance process that took place.

The interview is divided into 3 sections and consists of 5 questions with additional sub-questions. It will be conducted in a semi-structured format, with predetermined main questions, but with the possibility of adjusting them, asking them in a different order and/or making additional questions to clarify or deepen the answers or certain aspects, if the interviewer deems it necessary.

As previously indicated, the interview will be recorded so that answer can be transcribed correctly; you will be informed about the start of the recording. The researcher will transcribe the interview and share a copy with you for review. The transcript will then be translated into English for use in the research. I reiterate that the information provided in the interview will be anonymous for this study.

Please find below the questions to be asked during the interview:

Introduction

1. What is your professional background and how were you able to participate in the 100 Resilient Cities initiative and Mexico City's participation?
2. Urban resilience has gained momentum in recent years due to the challenges cities are facing today and the need to cope with shocks and stresses. How do you understand urban resilience and what are the most urgent topics in Mexico City?

Mexico City's Resilience Strategy

3. How do you think the Mexico City Resilience Strategy contributed to the city's resilience journey?
 - 3.1 When and how did the resilience journey start? Who were and are the main actors involved in urban resilience actions?
 - 3.2 What were achievements so far? Has the strategy catalysed any important actions and programs implemented?
 - 3.3 How are actions tracked and how is impact measured? Did 100RC provide any tools for this?

- 3.4** Has the opportunity of joining a global network enriched CDMX's resilient transition?
- 4.** In your opinion, what have been the main challenges for the design and implementation of the Strategy? (for example, were all relevant actors/stakeholders on board?)

After 100 Resilient Cities

- 5.** After 10 years and the end of 100RC where does the Strategy and its actions stand?
- 5.1** How do you ensure cross-sectoral cooperation and the stakeholder engagement process remain despite these changes?
- 5.2** How do you think the view on urban resilience has evolved and to what extent has resilience been institutionalised?

Appendix E: Interview Guide (Original Spanish)

Guía de Entrevista

Gracias por participar en la entrevista para la recolección de datos para el proyecto de investigación. El propósito de esta entrevista es comprender el proceso y trayectoria de resiliencia en la Ciudad de México a partir de su participación en la iniciativa de 100 Ciudades Resilientes. Está dirigida a expertos involucrados en el proceso de diseño e implementación de la Estrategia de Resiliencia de la CDMX, incluyendo funcionarios de gobierno, académicos, y sociedad civil.

Las preguntas tienen como objetivo explorar cómo se entiende la resiliencia urbana como resultado de 100RC, y comprender cómo la iniciativa y la Estrategia resultante han impactado en la transición resiliente de la ciudad al explorar los logros, las oportunidades, desafíos y el proceso de gobernanza que tuvo lugar.

La entrevista se divide en 3 secciones y consta de 5 preguntas con subpreguntas adicionales. Se llevará a cabo en un formato semiestructurado, con las preguntas principales predeterminadas, pero con la posibilidad de que se ajusten, se formulen en un orden diferente y/o se acompañen de preguntas adicionales que aclaren o profundicen las respuestas o ciertos aspectos, si el entrevistador lo considera necesario.

Como indicado previamente, la entrevista será grabada para que las respuestas puedan transcribirse correctamente; antes del comienzo de las preguntas, se le informará del inicio de la grabación. El investigador transcribirá la entrevista y compartirá una copia para su revisión. Posteriormente, la transcripción será traducida al idioma inglés para su uso en la investigación. Se reitera que la información proporcionada en la entrevista será anónima para este estudio.

A continuación, encontrará las preguntas que se formularán durante la entrevista:

Introducción

1. ¿Cuál es su trayectoria profesional y cómo pudo participar en la iniciativa 100 Ciudades Resilientes y la adhesión de la Ciudad de México?
2. La resiliencia urbana ha cobrado impulso en los últimos años debido a los desafíos que enfrentan las ciudades hoy en día y a la necesidad de hacer frente a choques y tensiones. ¿Cómo entiende la resiliencia urbana y cuáles son los temas más urgentes en la Ciudad de México?

La Estrategia de Resiliencia de la Ciudad de México

3. ¿Cómo cree que la Estrategia de Resiliencia de la Ciudad de México contribuyó al camino de la resiliencia de la ciudad?

- 3.1** ¿Cuándo y cómo comenzó el camino hacia la resiliencia? ¿Quiénes fueron y siguen siendo los principales actores involucrados en las acciones de resiliencia urbana?
- 3.2** ¿Cuáles han sido los logros hasta ahora? ¿La estrategia ha catalizado alguna acción y/o programa importante que ya haya sido implementado?
- 3.3** ¿Cómo se rastrean las acciones y cómo se mide el impacto? ¿100RC proporcionó alguna herramienta para esto?
- 3.4** ¿La oportunidad de unirse a una red global ha enriquecido la transición resiliente de la CDMX?
- 4.** En su opinión, ¿cuáles cree que han sido los principales desafíos para el diseño e implementación de la Estrategia? (por ejemplo, ¿estuvieron todos los actores/partes interesadas relevantes a bordo?)

Después de 100 Ciudades Resilientes

- 5.** Después de 10 años y del fin de 100RC, ¿dónde se encuentra la Estrategia y sus acciones?
 - 5.1** ¿Cómo se garantiza que la cooperación intersectorial y el proceso de participación de las partes interesadas se mantengan a pesar de estos cambios?
 - 5.2** ¿Cómo cree que ha evolucionado la visión sobre la resiliencia urbana y en qué medida se ha institucionalizado la resiliencia?