LOCAL POLICY DEVELOPMENT FOR THE IMPLEMENTATION OF THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION: REFLEXIONS FROM BRAZILIAN LOCAL GOVERNMENTS

DESENVOLVIMENTO DE POLÍTICAS LOCAIS PARA A IMPLEMENTAÇÃO DO MARCO DE SENDAI PARA REDUÇÃO DO RISCO DE DESASTRES: REFLEXÕES DOS GOVERNOS LOCAIS BRASILEIROS

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Introduction

In March 2015, a global blueprint for disaster risk reduction was adopted at the "Third UN World Conference for Disaster Risk Reduction (WCDRR)": the *Sendai Framework for Disaster Risk Reduction 2015-2030.* It constituted one of the first international agreements of the post-2015 development agenda, with seven global targets and four priorities for action that interlock with a string of other global accords for sustainable development over the next decade – notably the New Urban Agenda, the 2030 Agenda on Sustainable Development, and the Paris Agreement on climate change. UNDRR stated in the Sendai Framework that its main goal was to:

> "Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience." (UNISDR, 2015, p. 12)

As such, the Sendai Framework brought about a profound conceptual shift in the Disaster Risk Reduction (DRR) community, from viewing disasters purely as matters of preparedness and of relief operations, towards a pre-emptive and development-oriented approach. The shift brought by adoption of the Sendai

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Framework constituted a "field configuring event" (LAMPEL; MEYER, 2008), as it brought about a series of reforms that restructured different aspects of DRR governance, including the understanding of the complex nature of risk, the promotion of evidence-based decision making and policy development, and the dialogue between multiple levels of government.

In the context of our current climate crisis, these three aspects are fundamental to shaping new paths of development that integrate science into DRR and climate action to promote data-based policy making and policy development at national as well as local levels. The disaster impacts announced by the latest IPCC report (2021) show that urban areas play a central role as both sources of the problem[5] and of potential solutions[6]. This report is also evidence of the increasing importance of data in informing decision-making and policy development that foster more sustainable futures.

As urban growth across the world continues and the climate crisis worsens, evidence-based DRR policy becomes crucial. While stakeholders have pledged a commitment to fight our climate crisis and build more sustainable and resilient futures, policy makers often lack the tools and knowledge to convert data into actionable insight for better decision-making. Conversely, producers of evidence, particularly in academia, often lack a thorough understanding of the perspective of users, which may limit the applicability of research outputs. In this scenario, local and national governments need to guide the use of data more purposefully, in order to better inform and shape policy decisions that promote disaster risk reduction and help to build more resilient urban environments and more sustainable models of development. This, in turn, will ensure more equal access to economic opportunities and quality of life in urban centres.

With data, governments will be able to guide processes of decision-making and policy development to positively impact DRR governance ecosystems and build more resilient cities. Furthermore, new, and existing data sources and methods can guide more sustainable DRR solutions that can make meaningful progress toward climate and equity goals. This chapter will discuss the potential of evidence-based DRR decision-making by bringing lessons from UNDRR strategies for the implementation of the Sendai Framework at the local level through the MCR Campaign and the MCR2030 initiative. By exploring the implementation of these two strategies in Brazil, the chapter seeks to aid understanding of the developments and limitations of adopting an evidence-based approach for DRR policymaking and climate action at local level.

This chapter is organized in three sections. The first one presents an overview of the implementation of the MCR Campaign and the MCR2030 initiative, focusing on the Americas and the Caribbean region. The second one looks at Brazil as a case study of efforts advancing local implementation of the

Sendai Framework. The final section drafts some recommendations for the development of local DRR governance that considers data for evidence-based decision-making and policy development. We hope the experiences included in this chapter bring insights about the key role of data as an enabler to make more informed and more impactful decisions about DRR and sustainable development.

From an international framework to national and local implementation: The Making Cities Resilient 2030 Initiative

Implementing a shift from managing disasters to reducing risks, the Sendai Framework places an important emphasis on urban areas. Specifically, it called for strong political leadership, commitment, and involvement of all stakeholders at local, national, and international levels to pursue disaster risk reduction (UNISDR, 2015).

Following this rationale, **Target (e)** of the Sendai Framework aims to "substantially increase the number of countries with national and local disaster risk reduction strategies by 2030" (UNISDR, 2015). To implement this target, UNDRR instituted two parallel yet complementary initiatives: regional Scientific and Technical Advisory Groups (STAGs), and the global Campaign "Making Cities Resilient: My City is Getting Ready'', later reframed into the global Initiative Making Cities Resilient 2030 (MCR2030).

To address aspects of local governance dealing with urban risk mitigation and preparedness, the United Nations Office for Disaster Risk Reduction (UNISDR) launched, in 2010, the Global Campaign "Making Cities Resilient: My City is Getting Ready! (MCR-C). This campaign aimed to promote the local-level implementation of the *Hyogo Framework for Action 2005–2015*[7] (HFA) priorities, to raise awareness about the necessity of addressing risk reduction at the local level, and to advocate for city leaders to commit to the HFA. In 2015, with the adoption of the Sendai Framework, MCR-C underwent an important reconfiguration.

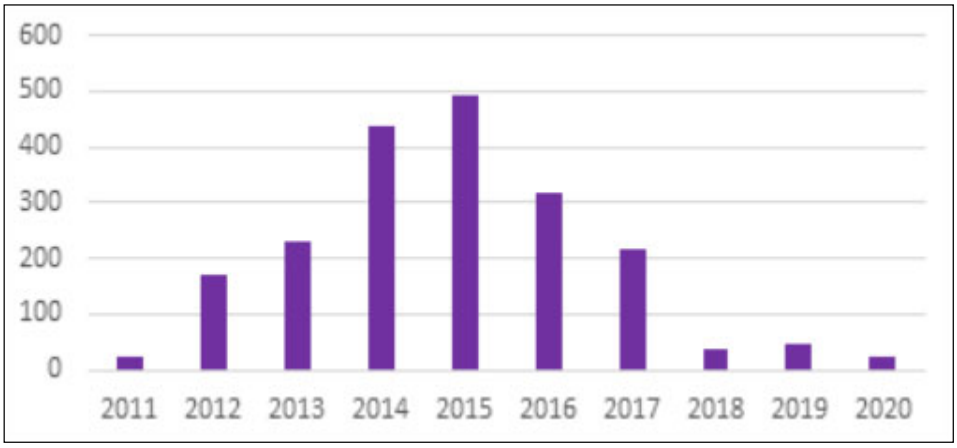
In 2020, after 10 years advancing the agenda for urban risk reduction and its integration into local governance frameworks, MCR-C was reframed into the MCR2030 initiative. In this new phase, MCR focuses on resilience and risk-reduction actions, planning and implementation. Another important shift was the configuration of an enhanced governance structure, now counting on the institutional and operational support of world-leading organisations in the field of urban resilience.

First phase of the MCR Campaign (2010-2015): role specialization within the transnational field of city-networks for urban sustainability

The MCR Campaign aimed to address local governance issues in urban risk reduction by supporting local governments in the local level implementation of the HFA. The initial phase (2010-2015), often referred to by UNDRR officials as the "first phase" or "pre-Sendai phase" was characterised by a strict focus on advocacy for local risk reduction.

The Global Launch of the MCR Campaign took place in Bonn (Germany) on 30 May 2010 as part of the Mayors Adaptation Forum at the Resilient Cities 2010 Congress. The Bonn Declaration, adopted during this Forum, committed to the implementation and monitoring of the Making Cities Resilient campaign, and invited the international climate community to recognize the increased leadership of local governments in climate change mitigation and adaptation. The same week, the regional launch of the MCR Campaign took place in Lima (Peru).

To find its place among an already large community of transnational city-networks engaged with urban sustainability issues, UNISDR first focused on enlarging its network of local partners. With the MCR Campaign serving as a recruiting platform, the rapidly growing membership of local governments from 2011 to 2015 in the Americas and the Caribbean (Figure 1) led to the creation of an international network of local stakeholders, structured around the UN agency.



Source: Da Cruz (2021) based on UNDRR's internal inscription database.

Figure 1. Annual registrations of member-cities to the MCR Campaign in the Americas and the Caribbean.

UNISDR then adopted a technocratic approach to coalition-building (DA CRUZ, 2021). At this time, the concept of 'resilience' was relatively new among local practitioners, as was its association with disaster events. MCR-C built a package of technical solutions and instruments – gathered into the "MCR Toolkit'' – to technically assist its new member-cities. This toolkit was a set of

policy guidelines and self-assessment tools[8] designed by UNDRR to facilitate the formulation of a Local Plan for Disaster Risk Reduction by MCR-C member-cities.

In theory, all member-cities had free access to the tools and committed themselves to applying them when joining the Campaign. In practice, the autonomous use of this toolkit was quite rare due to a relatively complex methodology. Municipalities would often request technical assistance services by UNDRR – which, in return, would send a Subject Matter Expert to conduct capacity-building workshops in disaster risk reduction and to coordinate multi-stakeholder meetings for the application of the tools and the formulation of the Local Plan.

In some cities, technical assistance was provided in collaboration with academic and scientific institutions, which helped to fill in the gap and to provide local expertise. Two examples are the State University of Campinas (UNICAMP) and Federal University of Juiz de Fora (UFJF). Both institutions have helped the local governments of Campinas in applying the Disaster Resilient Scorecard for Cities and even today keep their commitment to participating in capacity-building at local level.

Through its technical approach to dealing with disaster-resilience issues, the MCR Campaign was able to reach out to local governments of all political perspectives and all party-affiliations – in accordance with UNDRR's non-agonistic conception of local policymaking and apolitical stand in terms of partnerships[9]. This technical and specialised role of the MCR Campaign made the field of disaster resilience grow in scientization (BOTHELLO; MEHRPOUYA, 2019) with an increasing reliance on technical expertise.

Overall, the Campaign maintained a non-controversial presence within the ecosystem of transnational city-networks for urban sustainability (DA CRUZ, 2021). Until 2015, for instance, the Campaign would mainly focus on recruiting middle-size cities, often from less developed countries (Figure 2). This way, participants to the MCR Campaign were rarely a member of rival transnational city-networks, which would usually partner with large metropolises. The Campaign thereby sought to fill a gap in international support for disaster risk reduction at the local level and was aligned with the UNDRR's institutional legacy of working in humanitarian aid and disaster-relief.

Second, the MCR Campaign would avoid explicitly addressing the complexities and territorial specificities of the local agenda for disaster risk reduction. In contrast to other transnational city-networks, UNDRR launched the Campaign by defining "the city" merely as a lower administrative scale than national governments. This allowed the UN agency to replicate its operational framework - originally designed to work with national governments - intact to the local scale. As a result, the Campaign would address local governments without truly entering into the city policy arena and tackle complex urban issues. For

instance, sustainable territorial transformations and uneven urban growth patterns were treated as more of a collateral phenomenon to disaster risk reduction. This was particularly clear in UNDRR's interchangeable use of "urban resilience", "local resilience", "community resilience", "territorial resilience" or "city resilience" in its policy guidelines (DA CRUZ, 2021).

Overall, the first phase of the MCR Campaign showed an important expansion of the field of disaster resilience under the HFA, in terms of network, resources, and political opportunities. By the beginning of 2015, the MCR Campaign was already working with 2,498 local governments worldwide, making it one of the largest transnational city-networks.

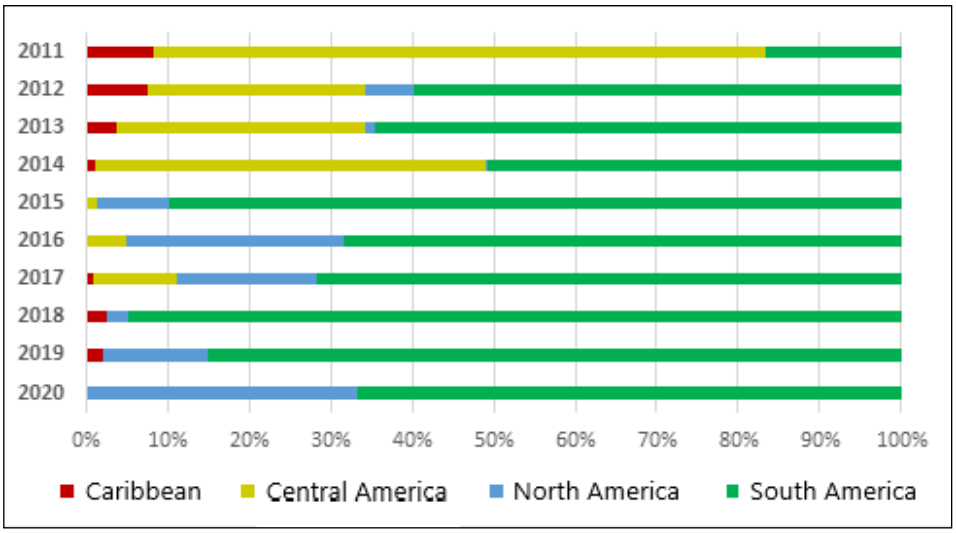
Second phase of the MCR Campaign (2015-2020): competitive pressures and marketization within the expanding field for disaster resilience at the city-level

The 2010s marked the emergence of new competitors within an increasingly popular and mediatized urban agenda for resilience - such as Rockefeller Foundation's 100 Resilient Cities, ICLEI's growing initiatives in climate risk adaptations, UN-Habitat's "Urban Resilience Lab", etc. Each newcomer would enter with a slightly different approach to resilience and a distinct set of services, in order to demarcate itself and compete for international funding. They would also demonstrate a more refined understanding of territorial dynamics at the city-level. This marketization of the field (BOTHELLO; MEHRPOUYA, 2019), however, led to a progressive fragmentation of international networks for urban resilience into rival agendas (DA CRUZ, 2021).

To consolidate its position in the face of such competitive pressures, the MCR Campaign underwent a series of reforms. The adoption of the Sendai Framework led to the restructuring of the MCR Campaign. Similar to many transnational city-networks (KERN; BULKELEY, 2009), the MCR Campaign decided to expand its priorities beyond accumulating city-members and raising the awareness of local leaders. It thereby started focusing on trading information, knowledge, funding, and mechanisms to support project planning, while actual implementation would be under the responsibility of local governments. In practice, this implied moving away from being a technocratic coalition-builder to becoming a "curator of best practices'' (BOTHELLO; MEHRPOUYA, 2019) in disaster resilience, starting a process of marketization[10] of the campaign.

An impact of such marketization can be found in UNDRR's shift in sub-regional priority as soon as 2015 (Figure 2). If the Campaign was first orientated towards the most vulnerable territories (as shown by the strong registration of Central American and Caribbean cities from 2012 to 2014), it became increasingly

targeted at more endowed cities – those ready for project implementation (reflected in a growing number of North American and Brazilian city partners since 2015). The MCR Campaign would then "curate" and give international visibility to the good practices of its champions – called "Role Models"[11].



Source: Da Cruz (2021) based on UNDRR's internal inscription database.

Figure 2. Annual registrations of member-cities to the MCR Campaign in the Americas and the Caribbean (by subregions).

This new role of curator was made possible by UNDRR's capacity to leverage a large and well-established membership base. For instance, the MCR Campaign augmented its focus on promoting implementation mechanisms to local governments. This "post-Sendai phase" called for city-to-city learning, better access to information that emphasised the need for integration of science and technology, as well as increased capacities for monitoring city progress. The counterpart of this new strategic orientation was a constant decrease in annual registration since 2015 (Figure 1).

In the post-Sendai era, the MCR Campaign started to integrate in its framework urban challenges mentioned in the New Urban Agenda (e.g., unplanned settlements, informality, lack of services and access to utilities). New policy guidelines were elaborated by UNDRR (i.e., the *Words into Action* series) to strengthen the integration of the disaster risk reduction and urban planning/development agendas (UNDRR, 2019b). The "Ten Essentials for Making Cities Resilient"[12] were an important step in this direction, offering an actionable checklist of indicators and promoting a transversal approach to risk reduction and management. This integration under the MCR Campaign took the form of increased dialogue between two professional sectors: Civil Defence and Urban Planning. Changes to UNDRR's methodology or policy guidance for local policymaking were thereby progressive and incremental.

A completely 'new phase': MCR2030 Initiative and the development of partnerships across networks as a strategy to lead the urban agenda for disaster resilience

As the MCR Campaign was programmed to end in December 2020, Campaign partners and cities asked for a follow-up programme that would move beyond awareness-raising and integrate mechanisms to effectively support disaster resilience planning and project implementation. Entering into the UN's "Decade of Action", cities were still in need of more guidance and capacity development, in technical areas ranging from awareness and strategic planning to effective implementation of risk-informed urban development plans.

However, with an almost saturated international field, the large variety of organizations, networks, methodologies, and services for urban resilience could end up confusing cities.

The launch of the Making Cities Resilient 2030 initiative (MCR2030) in January 2021 intended to respond to the increasing need within the international field of urban resilience for a systemic, joined-up approach. As such, MCR2030 constituted another "field configuring event" (LAMPEL; MEYER, 2008) for the disaster resilience agenda, mainly because UNDRR engaged with various transnational city-networks and international organisations[13] to co-design the new initiative and gather efforts and resources for disaster resilience.

Indeed, MCR2030 had the merit of opening unique coordination spaces within the international field of urban resilience, in the form of Global and Regional Coordination Committees. By orchestrating partnerships (BOTHELLO; MEHRPOUYA, 2019), UNDRR sought to decrease competition and differentiation in the international regulatory field for disaster resilience under the principles of the Sendai Framework (DA CRUZ, 2021). Nonetheless, UNDRR also took the opportunity to consolidate its position as one of the world's leading organisations for urban resilience by chairing these Committees.

Two other key innovations were the definition of a 'pathway' to resilience and the creation of an online Dashboard for cities to track their own progress, consult the profile of other members (experiences, lessons, etc.), and find specialist service providers and investors for actions and initiatives. As such, MCR2030 was built on lessons learned during the previous MCR Campaign implementation from 2010-2020. With the new initiative, UNDRR and its partners committed to bring heightened awareness to cities' most acute challenges in building disaster resilience.

On the one hand, MCR2030's pathway to resilience responded to UNDRR's growing understanding that the resilience journey of each city is unique. Some cities may just be starting out while others may already be advanced in implementing risk reduction activities. Considering resilience-building as a process, UNDRR and its

partners sought to develop a programme approach that was flexible enough to allow all cities to start their journey with MCR2030 and access the services that were most relevant at their particular stage of resilience-building. All in all, MCR2030 pinpointed cities' lack of access to financing streams, tools, and adequate service providers as the biggest hurdles at all stages of building resilience.

On the other hand, MCR2030's new Dashboard was expected to answer a frequent complaint by the former Campaign's staff, partners, and cities regarding the lack of systematic monitoring mechanisms at the city-level – in contrast to UNDRR's monitoring platform that exists for national governments. Before, UNDRR's regional offices, including in the Americas & the Caribbean, would rely primarily on local governments to share their progress with applying the toolkit[14], formulating a Local Plan or implementing actions, without any official means to register or compile this data afterwards.

In addition, MCR2030 recognised the imperative for local DRR and resilience strategies not to stand alone. Those policies must be developed in coordination with other global frameworks to address multiple, multi-scale and systemic risks that cities face, and reduce planning, resourcing, and reporting burdens on cities. DRR and resilience strategies need to work in conjunction with other policy frameworks, including climate adaptation and mitigation initiatives as determined by the Paris Agreement, to work in synergy with the New Urban Agenda and to contribute towards achieving the Agenda 2030 for Sustainable Development (SDGs).

Finally, MCR2030 brought additional emphasis on the crucial role of national governments in providing legislative empowerment to local governments, as well as budgetary and technical support. Bringing in national governments and national associations of local governments as partners and embedding support from national-level institutions dealing with urban planning and development is essential for the sustainable implementation of local resilience initiatives. It is now an essential part of the MCR2030's framework, which seeks to ensure coherence between national and local strategies

Case Study: the local-level implementation of the international framework for DRR in Brazil

To discuss the importance of policy development we will present the case of Brazil, a country that has led advocacy, debates, planning, and implementation of local resilience initiatives through its involvement with MCR-C and MCR2030.

Multi-level approach in practice: federal and subnational coordination

Brazil stands out as a motor of both the MCR Campaign and MCR2030 initiative. The country used to account for 1078 registered municipalities during the Campaign, a quarter (24.7%) of all participants worldwide. Under the MCR2030 initiative, it now accounts for 263 local governments, nearly 23% of MCR2030 participants worldwide, and 54% in the Americas and the Caribbean.

Brazil also spearheaded MCR2030's new strategic focus on strengthening national–local linkages. The objective is to ensure coherence between national, sub-national and local strategies for disaster risk reduction. MCR2030 seeks to bring together national, subnational, and local governments to strengthen multi-level governance arrangements for risk management. It emphasises the crucial role played by national and sub-national institutions in legislative empowerment and in technical and budgetary support to local governments.

Strategies for strengthening national–local linkages in Brazil have been slightly different from those of other countries in the Americas and the Caribbean, with MCR2030 adapting itself to the Brazilian federal regime. It hence emphasised the role of subnational governments (*Estados*) in articulating local action, while the federal government would play a secondary role of support and supervision to guarantee national coherence. All in all, MCR2030 has worked with 5 State governments and the Federal government, all via their Civil Protection and Defence departments. The states involved are Minas Gerais (which also includes the State Department of Health and Military Firemen); Rio de Janeiro; Rio Grande do Norte (which also includes the State Department of International Relations); Santa Catarina; and São Paulo (which also includes the State Department of Environment and Infrastructure).

At the federal level, the SEDEC (*Secretaria Nacional de Proteção e Defesa Civil*) supports the diffusion of MCR2030 across the country. It promotes the initiative to State governments, builds bridges between subnational actors and UNDRR, as well as helping to monitor progress and train public agents in DRR and resilience. Two key achievements of this partnership have been: (i) the publication of a webpage on MCR2030[15] on SEDEC's institutional website; and (ii) letter addressed to all State level Coordinators of Protection and Civil Defence in Brazil, requiring them to promote the registration of municipalities to MCR2030 in their state. In results, SEDEC has contributed to boosting city sign-up across Brazil and MCR2030 now liaises with a wider array of regions than during the former Campaign (i.e., States of Tocantins, Paraiba, Roraima, Paraná, Rio Grande do Sul, Sergipe, Pará, Bahia).

At the subnational level, State governments have first promoted MCR2030 via advocacy events, using the convening power attributed to them under federal laws to require the presence of all municipal coordinators for civil defence. This

was notably the case in the States of São Paulo, Rio de Janeiro and Rio Grande do Norte, where large advocacy and capacity-building events were held from September 2021 to May 2022, gathering hundreds of municipal agents each time.

Second, State governments have published a webpage on MCR2030 on their institutional website (replicating what the federal government had done on the matter), as well as guiding local governments with the signing-in process. This was executed in the States of São Paulo and Rio de Janeiro.

Finally, State governments have provided coordination and logistical support for the use of MCR2030 tools in Brazilian cities, providing continuity from the capacity-building events. For instance, the Scorecard and its Public Health Addendum were applied in the States of Minas Gerais (2 cities in December 2021), São Paulo (1 city in April 2022), Rio de Janeiro (2 cities in May 2022) and Rio Grande do Norte (1 city in May 2022).

It is in the State of São Paulo that a multi-level approach to disaster risk reduction fully aligned with UNDRR and MCR2030's guidelines has taken form. The São Paulo State has always been a key stakeholder of municipal politics, including areas of civil defence and disaster management. As a result, policy transfers[16] between the 645 municipalities within the State of São Paulo in the sector of risk reduction and civil protection are numerous.

The State of São Paulo became an active participant of the MCR Campaign in 2014 and was recognised by UNDRR as a Role Model State the same year. With the adoption of the Sendai Framework in 2015, the State Department of Civil Defence has been proactively aligning their normative and operational frameworks for disaster risk reduction to the new Framework.

The last element of this multilevel governance scheme for disaster risk reduction was put in place in December 2019, when the State of São Paulo launched the "Resilient Municipalities" programme (in December 2019). The partnership between the State Department of Civil Protection and the State Department of Infrastructure and Environment, under supervision of the State Court of Audit, launched an online platform for monitoring, evaluating, and supporting disaster risk reduction actions across the 645 municipalities of the State. With this program, the State of São Paulo conditioned access to some State resources for civil defence activities on the participation of municipalities in the MCR Campaign (and now MCR2030 initiative). These innovative regulation and fiscal instruments have enabled a coercive transfer (DOLOWITZ; MARSH, 1996) of the State's disaster resilience policy across its municipalities.

Local resilience as a policy goal: the experience of CAMPINAS

Campinas is a Brazilian municipality in the interior of the state of São Paulo, in the Southeast Region of the country. Despite being the fourteenth most populous municipality in Brazil and third in São Paulo State[17], Campinas is also predominantly rural (70% of total area).

Since the 1930s, industry and commerce have been the main sources of income. However, from the 1990s onwards, the city has been witnessing a marked shift in its economic base: the industrial sector has lost importance (with the migration of factories to neighbouring cities or other regions of the country), and the service sector has gained prominence (commerce, research, high-tech services, and companies in the logistics area). In addition, Campinas was responsible for at least 15% of all national scientific production in 2011[18], being the third largest Brazilian research and development hub, thanks to the presence of UNICAMP and the Pontifical Catholic University of Campinas. As such, the city is now considered a highly competitive scientific and industrial hub at both regional and national level, with the eleventh largest GDP among the country's municipalities.

An intense conurbation process currently underway around Campinas led to the creation of the Metropolitan Region of Campinas (MRC) by state complementary law 870 on June 19th, 2000. It currently consists of twenty municipalities, being the tenth largest urban agglomeration in Brazil, with 2.7% of the national gross domestic product[19].

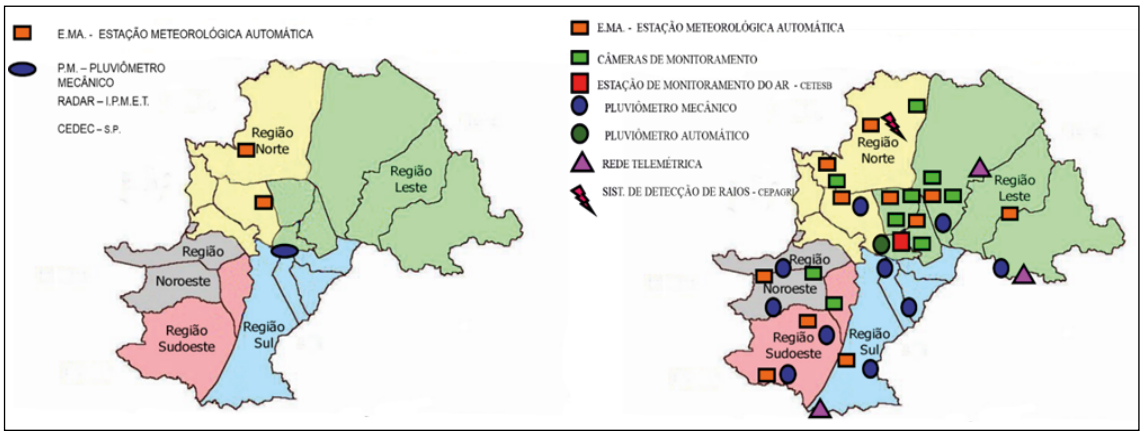
All in all, the Municipal Human Development Index (HDI-M) of Campinas is considered very high under the standards of the United Nations Development Programme – 28th across Brazil[20].

The disaster resilience agenda first emerged in Campinas when the city was hit in 2003 by a severe storm that led to the declaration of a state of emergency for public calamity. The Municipal Council of Campinas therefore decided, in 2005, to increase investments in disaster risk reduction. According to city officials, the disaster of 2003 had the benefit of revealing profound gaps in the municipality's risk-management system and triggered a true paradigmatic shift from emergency operations towards prioritising risk mitigation and disaster preparedness (DA CRUZ, 2021).

Since the 2003 storm: scientific actors support the technological modernization of the Municipal Department of Civil Defence and Protection in Campinas.

In 2003, disaster risk reduction actions were limited by a lack of capacity, resources, and the structure of Campinas' municipal civil defence. The municipality therefore engaged in the improvement of its risk-monitoring technology and communication strategy, adopting an engineering approach to resilience[21].

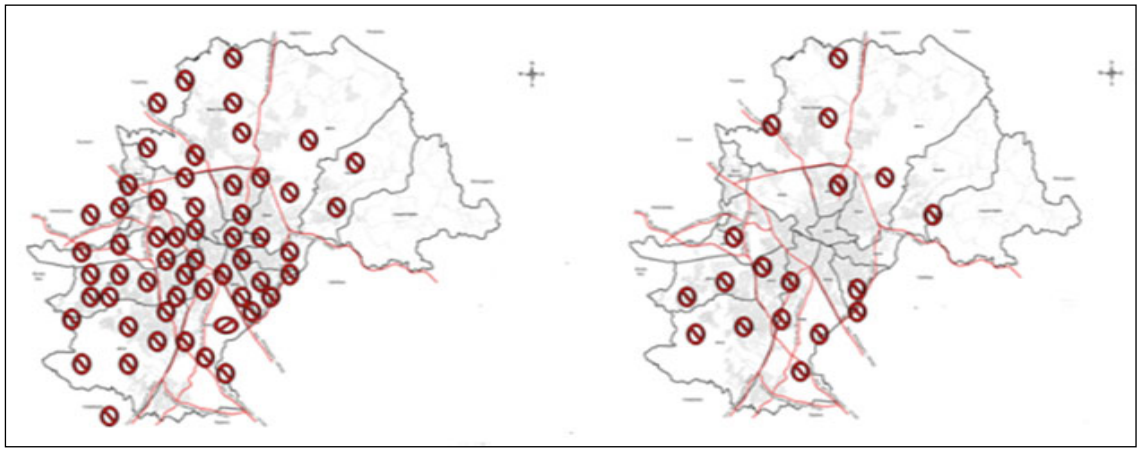
Since 2005, considerable municipal investments have gone into expanding Campinas' disaster warning system via the installation of climate monitoring technologies and sensors (Figure 3). The municipality also hired, in 2010, risk disaster and GIS experts (provided by the Geological services of the federal government) to elaborate disaster scenarios based on the data collected by its new disaster warning system. In 2014, Campinas was the first municipality in its metropolitan region to map at-risk areas ("Cartas de Suscetibilidade") and to integrate this information with its urban planning documents. Scholars from UNICAMP were also key partners for local risk-mapping processes (DA CRUZ, 2021).



Source: Prefeitura de Campinas, COMPDEC (2021) - (internal documents).

Figure 3. Improvement and expansion of Campinas' disaster warning system from 2005 (left) to 2020 (right).

In 2012, Campinas enrolled in the MCR Campaign. In 2013, it received the title of "Role Model City" from UNDRR. The key indicators of success included in their application report are still frequently used by Campinas' COMPDEC in many of their public presentations: from 2005 to 2013, the city decreased by 64% the quantity of vulnerable households in at-risk areas[22] (Figure 4). Nonetheless, such activities – designated as "risk-informed urban planning" – partly relied on the removal of human settlements out of most exposed areas, rather than a disaster-resilient requalification of those urban areas.



Source: Prefeitura de Campinas, COMPDEC (2021) - (internal documents).

Figure 4. Map of areas at risk of flooding and landslides in the municipality of Campinas, from 2005 (left side) to 2013 (right side).

Continuing efforts in the technological modernization of Campinas' COMPDEC were also maintained, notably with the creation, in 2016, of an online platform that provides live meteorological information and open-source data on climate hazards – called the "Resilient Campinas Platform" – created in collaboration with CEMADEN[23].

Since the global adoption of the Sendai Framework: institutional modernization of the disaster resilience agenda in Campinas under the MCR Campaign.

Campinas' alignment with UNDRR, via the MCR Campaign, brought about a redesign of organisational structure for its Civil Defence. Following the recommendations of the Hyogo Framework (and later the Sendai Framework), Campinas sought to modernise its approach to risk management by focusing on risk reduction rather than contingency and response.

This institutional modernization mainly took the form of the creation, by municipal decree, of the Resilient City Committee in 2013. The Committee promotes awareness campaigns and disaster preparedness workshops open to all civil servants that are held in cooperation with the Civil Protection and Defence Training Centre – which was created the same year and attached to the City Hall's School for Government and Civil Service Training (EGDS[24]). The modernization process received considerable support from UNICAMP, more precisely the "Land Planning, Resilience and Sustainability Study Group" (GEO3) linked to the Institute of Geosciences.

The overall result of this new strategy was the institutionalisation of the resilience agenda. Local actors highlight here the importance of municipal decrees and legislation to guarantee continuity and stability in civil defence actions:

> "The first issue we always worked on when some project came out was to try to formalize it into some legislation. So, you insert the item in some sort of norms or municipal document. […] Anything you discuss has to have a logic behind it. It has to be inserted into some legislation; it is the basis of anything. It has to have a legal basis to ensure sustainability from a financial point of view too." (DA CRUZ, 2021, p. 51)

As such, Campinas was the first city in Brazil to develop a Local Plan for Resilience in 2017 with the technical assistance of UNDRR. The UN office supported Campinas with the application of the Disaster Resilience Scorecard for Cities in 2016 and provided a baseline for identifying disaster resilience capacities and challenges to inform their future Plan.

The Plan identified four key partners (PREFEITURA DE CAMPINAS, 2017, p. 29) - public agencies, private actors, academia and research institutes, and local communities and civil organisations. It also strictly followed UNDRR's methodology (on p.55, the Plan monitors the outcomes of previous resilience-building initiatives in Campinas according to MCR Campaign's "10 Essentials to make cities resilient" checklist).

The 2017 Resilience Plan enabled the launch of the "Resilient Community" project, which had been designed in 2016 by Civil Defence actors. Under this project, aimed at teaching risk awareness and resilience practices to "the most vulnerable" (i.e., senior citizens, women, people with disabilities and children), a more inclusive risk-governance scheme was strengthened in Campinas by multiplying opportunities for the formal participation of communities in decision-making processes (i.e., City Youth Council, Municipal Council for Women's Rights, Municipal Council for the Elderly, Municipal Council for the Rights of Disabled People). As a result, Campinas was awarded UNDRR's Sasakawa Prize in 2019[25].

With international recognition came an effort of municipal civil defence actors in Campinas to share their experience with neighbouring cities. Their first efforts date back to 2010, with the creation of a thematic chamber in the Development Council of AGEMCAMP – the metropolitan agency of the Campinas region set up in 2003[26]. The municipality of Campinas mainly sought to increase collaboration with neighbouring municipalities through the development of common contingency plans. Interviewees working at Campinas' COMPDEC referred to the metropolitan area as a "network of sentinels", with each city protecting and sharing warnings with the others under an integrated early warning system.

It is important to note that the scaling-up of the disaster resilience agenda was embedded in a context of limited metropolitan resources and capacities for local policymaking. According to the Director of Campinas' COMPDEC, the

"Resilient Community" project was vital in materializing a clear and concrete object of policy transfers across the metropolitan region on which to base inter-municipal dialogue at AGEMCAMP:

> "The [metropolitan] region helped by replicating "Resilient Community" in other neighbouring municipalities, delivering ambulance cars, IT equipment, a weather station too, and in return the municipalities had to consolidate their legislation on civil defence and disaster risk reduction and organise themselves better. The last purchase we made was for the installation of a weather radar that will serve the entire region, with the support of UNICAMP. It required a lot of money, about 3 million [Brazilian Reais], which had already been negotiated and approved by the mayors." (DA CRUZ, 2021, p. 56)

Since the COVID-19 crisis: "an opportunity" for civil defence actors to expand their influence on municipal affairs and lead pandemic management

The severity of the COVID-19 crisis in Brazil constituted yet another *focused event* in the urban agenda for disaster resilience. In Campinas, the COMPDEC emerged as the actor best suited to lead the city's answer to the challenges of systemic shutdown of daily activities and services, while dealing with federal regulations to local capacities and resources for public health and crisis management.

In this regard, the rhetoric employed by Civil Defence actors was key in defining the sanitary situation as a "disaster event". Sidnei Furtado, Campinas' Director of COMPDEC, in his public conferences[27], often links the pandemic with other epidemiologic events that were previously handled by the Civil Defence – such as a dengue episode in 2005 and a severe yellow fever crisis in 2014[28]. This rhetorical operation aims to logically position civil defence actors as the most experienced in the field – even more so than health departments – and most likely to provide policy learnings and good practices.

As such, the methodological framework of the MCR Campaign (e.g., its 10 Essentials) was once again utilised to inform the municipal management of the pandemic. Thereby, the municipality of Campinas established a multi-sectoral COVID-19 Committee, reminiscent of the Resilient City Committee, to pilot emergency operations. The Committee was placed under the leadership of the COMPDEC.

More precisely, Sidnei Furtado explained in his interview that he sits at twenty sub-commissions of the Committee. As a result, civil defence actors deal with varied public health issues - such as mortuary management, vaccination campaigns, communication of COVID-related data – as well as urban topics for which they do not have full authority nor capacity:

> "Yesterday, for instance, it was about public transport: how to deal with opposing demands that want to maintain transport services but without crowding people inside the buses and getting sick? We have a methodology that we call the "Top 10". What are the 10 busiest lines? Which are the 10 most infected neighbourhoods? This guides local action. What is local action in this case? Expensive disinfection of bus stops, mask delivery, and rule enforcement. […] It can easily be chaos... and it's all interconnected! That's why the UN talks about systemic risk, right?" (DA CRUZ, 2021, p. 58)

In September 2021, the COVID-19 Committee was mobilised to implement the Public Health Addendum to the Disaster Resilience Scorecard for Cities, UNDRR's latest tool, designed with the World Health Organization. MCR2030 technically assisted in the application of the tool. With the Addendum, Campinas sought to advance the integration of the risk reduction agenda in all relevant local policy sectors.

After the municipal elections of November 2020 and a shift at the highest executive level in January 2021, civil defence actors in Campinas saw an opportunity to amplify technological modernization and risk-communication measures, especially in rural areas.

Namely, Campinas' COMPDEC extended its activities in Northern rural territories to include the environmental preservation area "Sousas e Joaquim Egídio"[29], located at the North-eastern bounds of the city (Figure 5). Within the ecological park (APA), the "Resilient Community" project established a "Centre for Emergencies and the Systemic Management of Nature" to educate residents from surrounding rural areas on the local fauna and flora and the risks associated with them.

Source: Prefeitura de Campinas, COMPDEC (2021) - (internal documents).

Figure 5. Ecological Park (APA) "Sousas e Joaquim Egídio".

The project is completed by an educational and social network app[30], designed in collaboration with FIOCRUZ[31] and the zoologists of the Zoonosis Monitoring Unit of Campinas (UVZ[32]), for residents to have access to information on biological species, receive alerts in case of wildfire or spread of animal diseases, and share pictures of any anomalies or incidents in the ecological park (e.g., a wounded animal, plastic waste).

Since then, scholars in Campinas have been increasingly mobilised by Civil Defence for data-driven projects and technological solutions, with less of a focus on community participation. Participative operations are now limited to the mobilisation and training of volunteer residents and fireman to limit the spread of wildfires and zoonotic diseases (Operations "Verão" since 2018 under the direction of São Paulo's State Department of Civil Defence and Protection, and Operations "Estiagem" to start in summer 2021 under the Municipality of Campinas).

Recommended developments for DRR Local Governance

The MCR Campaign underwent several phases in its activities and guidance of local policymakers, adopting different directives according to the successive international mandates for disaster risk reduction. The Campaign progressively adapted its services and its relations with participating local governments as its positioning within the international field for urban resilience improved. The growing number of member-cities actively implementing risk reduction initiatives through the MCR Campaign allowed the maturation of an urban agenda for disaster resilience.

A conclusion that can be drawn from the MCR Campaign and Initiative is that urgency to act on building resilience is unavoidable but that local governments need to integrate data to inform decision making and policy development to ensure effective decisions and actions.

Nonetheless, MCR2030's field orchestration strategy is still under development, as UNDRR tries to design innovative solutions to address the challenges it faced under the previous Campaign. Members of MCR2030's coordination committees (both global and regional) are still negotiating joint-programming and funding so as to build synergies and not duplicate city-commitments to transnational city-networks for urban resilience. The main challenge is to guarantee that MCR 2030 provides significant added value, in a field already saturated by urban resilience organisations.

A preliminary step to building synergies with external partners seems to lie in enhancing coherence and consistency within UNDRR's own strategic framework for local action.

The launch of MCR2030 enabled new conversations to start that have clarified UNDRR's programming, rhetoric, and positioning within the urban agenda for

disaster resilience. A strong emphasis is being given to strengthening the integration of disaster risk reduction with other agendas that are key to local policymakers. For example, in parallel to the launch of MCR2030, UNDRR released a new report in the *Words into Action* series which specifically tackles the integration of disaster resilience into land-use planning and urban development norms (UNDRR, 2019c). Finally, MCR2030's strategic framework was developed in explicit alignment with the Agenda 2030, the New Urban Agenda and the Paris Agreement.

UNDRR is also seeking to improve MCR2030's coordination with science and evidence-based policymaking at the local level. This topic was a blind spot of the former MCR Campaign, and MCR2030 is now seeking to intensify partnerships with universities and research institutes in areas of urban risk management. Universities and research institutes can join the initiative as "supporting entities" and display services available to municipalities on MCR2030's Dashboard. In Brazil, institutions like CEMADEN, the Federal University of Juiz de Fora, and the Federal University of Rio Grande do Norte have registered to the platform and are now offering online courses on risk management as well as contributing to capacity building events organised by UNDRR. However, further integration of science-and-evidence-based policymaking into MCR2030's strategic framework is still required.

The science and technology community plays a vital role in establishing a framework for evidence-based decision-making that embraces locality. The Sendai Framework, since its adoption in 2015, stresses the importance of both bottom-up and top-down approaches that include local and technical knowledge (AITSI-SELMI et al., 2016). The top-down approach highlights the role that public and private sectors, academia, technical experts, and other institutions can play to influence and shape policies "in order to facilitate a science policy interface for effective decision-making in disaster risk management" (UNISDR, 2015, p. 15). On the other hand, the bottom-up approach is focussed on communities that reflect "traditional, indigenous and local knowledge and practices" (UNISDR, 2015, p. 15) and that are able to complement scientific knowledge in disaster risk reduction (Table 1). Nonetheless, as stressed in the Sendai Framework, the science, technology, and academic community as a whole have an important role at all levels and in all sectors to strengthen disaster risk reduction. The MCR2030 is seeking to bring a more explicit focus on the role of data and technology in decision-making and policy development at the local level. This requires both promoting collaboration with academic and technological institutions that have a rooted understanding and solid research about local conditions and integrating local and traditional knowledge into DRR knowledge production and planning. This is highlighted in the Sendai Framework at the local level (Table 1).

Table 1. Sendai Framework and integration of science and technical experts at national and local levels.

Sendai Framework for Disaster Risk Reduction 2015-2030		
Priority 1	(h) To promote and improve dialogue and cooperation among scientific and technological communities, other relevant stakeholders, and policymakers in order to facilitate a science policy interface for effective decision-making in disaster risk management;	Top-Down Approach
	(i) To ensure the use of traditional, indigenous, and local knowledge and practices, as appropriate, to complement scientific knowledge in disaster risk assessment and the development and implementation of policies, strategies, plans and programmes of specific sectors, with a cross-sectoral approach, which should be tailored to localities and to the context;	Bottom-Up Approach
	(j) To strengthen technical and scientific capacity to capitalise on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities, and exposure to all hazards;	Internal Approach
Role of Stakeholders	Academia, scientific and research entities, and networks to focus on the disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national, and local application; support action by local communities and authorities; and support the interface between policy and science for decision-making;	All-Society Approach

Source: Sendai Framework.

In the case of Brazil, efforts to implement the Sendai framework at the local scale and to integrate science and technology into decision-making and policy development have allowed a modernization of local risk management from reactive approaches to prevention and resilience-building approaches. In Brazil, this modernization has been evident in cities, such as Campinas, that have successfully worked across different sectors of the government and are increasingly engaging with local and external stakeholders including academic and technology institutions.

Such diversification of stakeholders and the enhanced use of science and technology for resilience evaluation and planning are evidence of an important shift in DRR governance that is seeking to ground the international agendas in local realities.

Notes

5 “Net anthropogenic GHG emissions have increased since 2010 across all major sectors globally. An increasing share of emissions can be attributed to urban areas.” (IPCC, 2021: B.2).

6 Urban areas can create opportunities to increase resource efficiency and significantly reduce GHG emissions through the systemic transition of infrastructure and urban form through low-emission development pathways towards net-zero emissions.” (IPCC, 2021: C.6).

7 The *Hyogo Framework for Action 2005-2015: Building the Resilience of*

Nations and Communities to Disasters (HFA), passed in 2005 by United Nations Member States. It indicated the need for national governments to *"recognize the importance and specificity of local risk patterns and trends, [and] decentralise responsibilities and resources for disaster risk reduction to relevant subnational or local authorities, as appropriate."* (UNISDR, 2005, p. 6).

8 i.e., Quick Risk Estimation tool; LG-SAT - then reformed into the Disaster Resilience Scorecard for Cities (preliminary and detailed).

9 For instance, despite profound political changes across the Americas over the last decade, the MCR Campaign has remained constantly neutral in its partnerships with municipalities as to maintain the DRR agenda into the local policy arena.

10 Bothello & Mehrpouva (2019) understand marketization as the increased reliance on market-based principles to organise a given regulatory field. Such a process usually leads to enhanced competition between organisations that seek to differentiate themselves instead of cooperating. This can include mechanisms such as the production of technical and performance standards, the curating of best practices, or the use of marketing and communication campaigns.

11 "Role Models are authorities or local governments that have implemented innovative, creative, inclusive and efficient measures to realise strong political will in the field of Disaster Risk Reduction (DRR) at local level" (UNDRR, 2019a). Cf. https://www.unisdr.org/campaign/resilientcities/signup/article/role-model.html.

12 Cf. List of the 10 Essentials (UNISDR, 2017) .

13 Including: Cities Climate Leadership Group (C40 Cities), Global Resilient Cities Network (R-Cities), Local Governments for Sustainability (ICLEI), the International Federation of Red Cross and Red Crescent Societies (IFRC), the Japan International Cooperation Agency (JICA), United Cities and Local Governments (UCLG), the United Nations Human Settlements Programme (UN-HABITAT), the United Nations Office for Project Services (UNOPS), the World Bank Group, and the World Council on City Data (WCCD).

14 For instance, the Disaster Resilience Scorecard served as the main source of quantitative information on the resilience performance of city-partners. Yet, the design of the Campaign never referred to it as a post-implementation evaluation tool (which the Scorecard had the capacity to be). In consequence, the cities that applied the Scorecard (which are not even half of the registered cities at the global level), most frequently only did it once. It rendered impact evaluation impossible to UNDRR's staffs.

15 Cf. https://www.gov.br/mdr/pt-br/assuntos/protecao-e-defesa-civil/cidades-resilientes.

16 Policy transfer is an umbrella-term in Policy Theory to describe the transmission from one political government to another (whether a country or a city) of knowledge about solutions, learnings, or institutional arrangements put in place to solve a given policy issue (Dolowitz & Marsh, 1996; Hoyt, 2006). The concept is often

used when analysing policy changes and the convergence of public actions in different places (Bennett, 1991).

17 Instituto Brasileiro de Geografia e Estatística (IBGE) (27 de agosto de 2020). «Estimativas da população residente no Brasil e unidades da federação com data de referência em 1º de julho de 2020».

18 Inovação Tecnológica (21 de março de 2011). «Campinas terá seu terceiro parque tecnológico». Consulted on June 27, 2022.

19 «Produto Interno Bruto dos Municípios - 2016». Instituto Brasileiro de Geografia e Estatística. Cf.

20 «Produto Interno Bruto dos Municípios». Instituto Brasileiro de Geografia e Estatística. Cf.

21 An engineering approach to resilience is adopted by decisionmakers who tend to focus on a given system's capacity to resist hazards and re-establish its normal functioning as quickly as possible after a shock. For cities, this implies a static vision of urban systems and their way of operating. Usually, such a vision of risk management leads to an almost exclusive focus on short-term reactive measures, even more so if the disaster event provokes public emotion, rather than to prevent its impacts through appropriate prevention actions for risk mitigation and adaptation. In addition, local decisionmakers will tend to focus on technological and engineering solutions, in order to better protect or rebuild the city's critical infrastructure (Quenault, 2013).

22 CEMADEN, "Série de Debates – 'Ciência, Riscos e Desastres'" [online]. Youtube", 16th of April 2021 (consulted the 16th of April 2021 – livre retransmission), 1:06:56. Available at: https://www.youtube.com/watch?v=sk1yg0y2XOs.

23 National Centre for Natural Disasters Monitoring and Warning.

24 In Portuguese: Escola de Governo e Desenvolvimento do Servidor (EGDS).

25 The 2019 edition of the Prize recognized individuals, organizations and initiatives that contributed to ensuring the participation and inclusion without discrimination of all members of society, especially people living in poverty, in activities for disaster risk reduction.

26 Under the Law n°946/2003 on the creation of AGEMCAMP (Agencia Metropolitana de Campinas). Among AGEMCAMP's main attributions are the supervision of the execution of the metropolitan laws; establishing goals, plans, programmes, and projects of common interest, as well as supervising and evaluating their execution; and maintaining technical and administrative structures of adequate dimensions, giving priority to the decentralized execution of works and services (AGEMCAMP's website, consulted the 25/04/2021).

27 Cf. CEMADEN, "Série de Debates – 'Ciência, Riscos e Desastres'" [online]. Youtube", 16th of April 2021 (consulted the 16th of April 2021 – livre retransmission), 1:06:56. Available at: https://www.youtube.com/watch?v=sk1yg0y2XOs.

28 Campinas was the most affected city at national level by the yellow fever in terms of cases (Johansen et al., 2016).

29 With an area of approximately 222 square kilometres (corresponding to 27% of the municipal territory), the ecological park is the area with the highest concentration of water and natural forests in Campinas, with 60% of the remaining original Atlantic Forest. The region counts 250 species of birds, 68 mammals, 45 amphibians and 40 reptiles (internal documents, Municipality of Campinas, 2021).

30 The app is called SISS-GEO, which stands for "Information System Platform for Wildlife Health".

31 The Oswaldo Cruz Foundation, based in Rio de Janeiro, is one of the world's main scientific institutions for research and development in biological sciences and public health.

32 Unidade de Vigilância de Zoonoses.

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