

# Climate governance and adaptation in Brazilian cities

**Gabriela Di Giulio**

Associate Professor

Environmental Department - School of Public Health  
University of São Paulo

Visiting Researcher  
Politics Department  
University of York

ggiulio@usp.br

- **Critical aspects/challenges for advancing adaptation in large Brazilian cities**
- **Urban adaptation index**



Photos: Marcos Akira Watanabe

- **climate change is a condition of our time**
- **challenges our ability to framing it as global and local problem**
- **climate change agenda - political and social elements**
- **current Brazilian scenario- efforts of subnational governments**
- **transdisciplinary research - potential avenue**

# URBAN CLIMATE ADAPTATION



Cities	Territorial area <sup>a</sup> (Km <sup>2</sup> )	Population Density <sup>a</sup> (hab/km <sup>2</sup> )	GDP per capita <sup>a</sup> (U\$)	HDI <sup>a</sup>	Green public areas <sup>a</sup>	Socio Climatic Vulnerability Index <sup>c</sup>
Natal	167	4.805	6.391	0,763	45 %	High vulnerability
Manaus	11.401	158	8.668	0,737	24 %	High vulnerability
Porto Alegre	497	2.838	12.267	0,805	83 %	Low vulnerability
Vitoria	97	3.338	17.219	0,845	65 %	Medium vulnerability
Curitiba	435	4.027	11.868	0,823	76 %	Low vulnerability
São Paulo	1.521	7.398	14.457	0,805	75 %	Medium vulnerability

Note: <sup>a</sup>IBGE2010; <sup>b</sup>Dollar variation on June 04<sup>th</sup> 2018 (1U\$ = 3,76 R\$) <sup>c</sup>Darela-Filho et al. 2016

Framework		Assessing constraints for adaptation across the municipal level					
Dimensions that affect the ability of local government to advance in adaptation	Main elements	SPO	VIT	POA	CUR	NAT	MAN
<b>Dimension 1 - Cognitive factors</b>	risk perception	+	+	+	+	+	+
(to motivate climate adaptation)	level of awareness	+	+	+	+	+	+
<b>Dimension 2 - Resources</b>	staff	+++	+++	++	+++	++	++
(to advance the adaptation agenda)	information	+++	++	++	++	+++	++
	funding	++	++	+++	++	++	++
<b>Dimension 3 - Organizational factors</b>	participation in climate networks	+	+	+	+	+	+
	climate regulatory frameworks	+	(-)	(-)	(-)	(-)	+
(to deploy resources and integrate adaptation as a central theme)	<b>administrative routines/practices</b>	+++	+++	+++	+++	+++	+++
<b>Dimension 4 - Political aspects</b>	<b>political will</b>	+++	+++	+++	+++	+++	+++
(to implement climate initiatives)	<b>level of commitment</b>	+++	+++	+++	+++	+++	+++
<b>Dimension 5 - Local dynamics of urban planning</b>	<b>mismatch between the scale of urban issues and the extent of local government authority</b>	+++	+++	+++	+++	+++	+++
(to consolidate adaptation interventions)	<b>pressures from private sector</b>	+++	+++	+++	+++	+++	+++
	<b>inspection</b>	+++	+++	+++	+++	+++	+++

+ low impact; ++ moderate impact; +++ high impact; (-) no existence

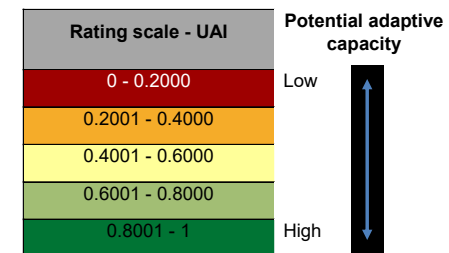
Dimensions	Indicators
<b>Housing</b>	<ul style="list-style-type: none"> <li>• municipal housing plan</li> <li>• municipal council</li> <li>• municipal funding</li> </ul>
<b>Urban mobility</b>	<ul style="list-style-type: none"> <li>• municipal mobility plan</li> <li>• cycle lane</li> <li>• bicycle racks</li> <li>• intermunicipal public transport</li> <li>• intramunicipal public transport</li> </ul>
<b>Sustainable agriculture</b>	<ul style="list-style-type: none"> <li>• organic agriculture</li> <li>• family farming</li> <li>• community gardens</li> <li>• climate program for agriculture</li> <li>• program for associativism</li> </ul>
<b>Environmental Management</b>	<ul style="list-style-type: none"> <li>• municipal environmental funding</li> <li>• sanitation</li> <li>• environmental protection</li> <li>• air pollution</li> <li>• biodiversity protection</li> <li>• climate adaptation and mitigation</li> <li>• integrated solid waste management plan</li> <li>• environmental services payment</li> </ul>
<b>Climate risk responses</b>	<ul style="list-style-type: none"> <li>• law of land use and occupation related to flood prevention</li> <li>• law of land use and occupation related to landslide prevention</li> <li>• municipal plan risk reduction</li> <li>• geotechnical chart of suitability for urbanization</li> <li>• municipal civil defense</li> </ul>

## Urban Adaptation Index

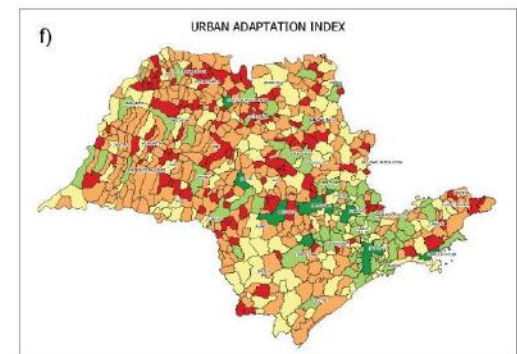
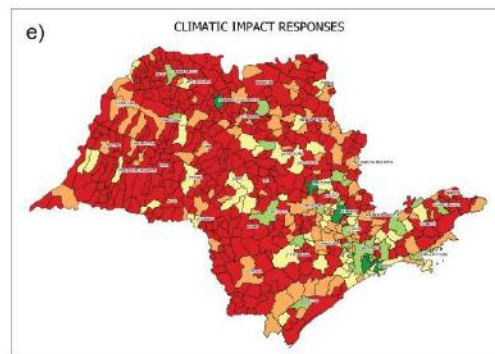
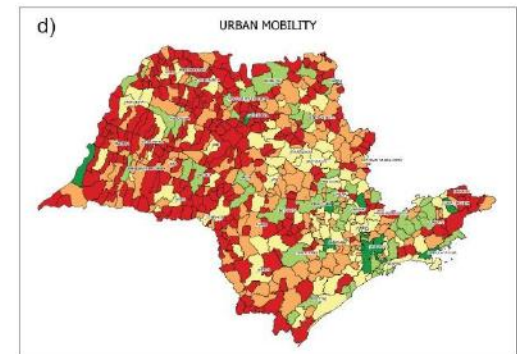
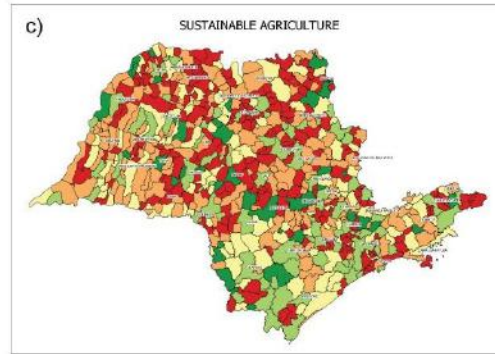
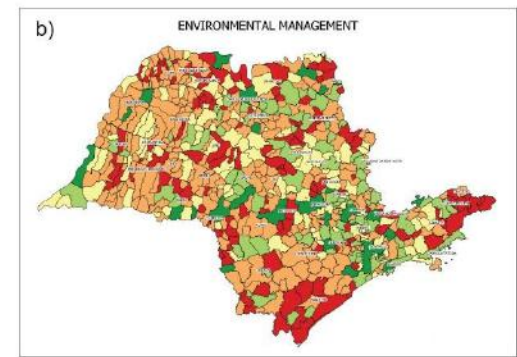
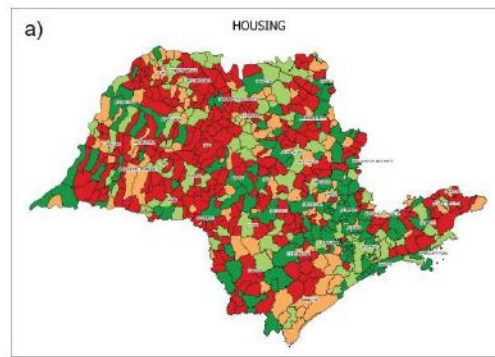
- assessment of the presence/absence of legal/regulatory structure to support adaptation
- climate projections and the system of governance
- municipal responsibility

- central issues of urban adaptive capacity
- available data
- alignment with Brazilian Adaptation Plan

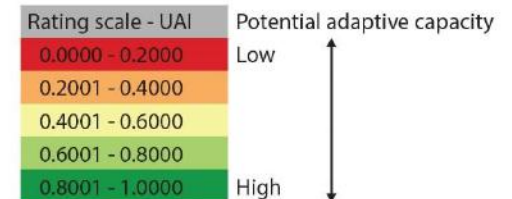
rating scale (0 – non-existence to 1 – indicating existence) - score cities' capacity to align public policies to climate adaptation



Neder, E.A. ... Di Giulio, G.M. Urban Adaptation Index: Assessing cities readiness to deal with climate change. Climatic Change. May, 2021 (doi: 10.1007/s10584-021-03113-0)

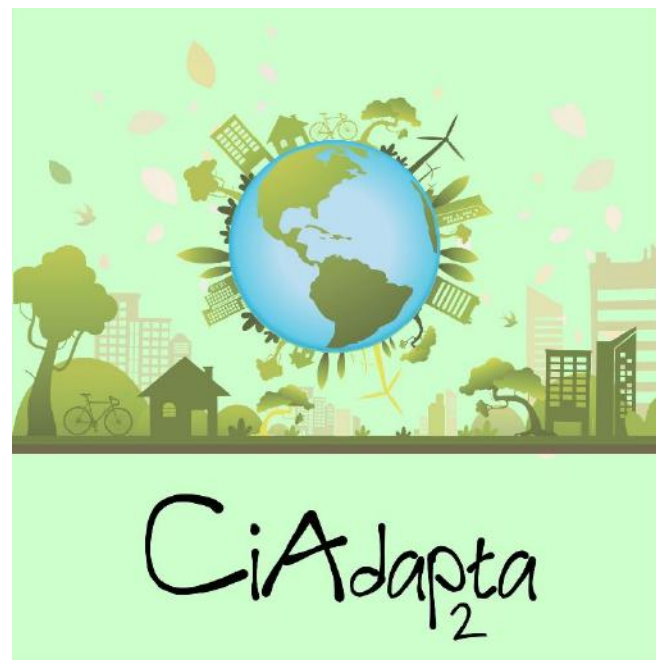


0 150 300 km



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# Acknowledgments



<https://ciadapta.webnode.com/our-people/>

<https://ciadapta2.wixsite.com/ciadapta/nossa-equipe>

**Thank you!**  
**Contact: ggiulio@usp.br**