# Urban oasis for adaptation to cClimate change: analysis of climate adaptation plans (CAP) around the world

Bruna Dallaverde Sousa, Daniel Felipe Outa Yoshida, Denise Helena Silva Duarte*
UNIVERSIDADE DE SÃO PAULO, São Paulo, Brazil
dhduarte@me.com, dhduarte@usp.br

## Abstract

Driven by climate change, especially the increase in the occurrence of heat waves around the world, this work has the objective of systematizing the municipal climate adaptation plans collected according to the criteria outlined in the document Measuring Benefits of Urban Heat Adaptation published in March 2021 by the C40 Group of Major Cities for Climate Leadership. The main results show that, out of 259 documents raised, only 154 effectively correspond to Climate Adaptation Plans, being that most of these documents are American. Among the actions proposed by C40, mention of mitigation is present in all documents, through the guideline aimed at reducing greenhouse gas emissions. The second most mentioned action refers to green infrastructure, 75%. However, it is important to highlight two other actions: heatwave response planning and development of cooling places, mentioned in only 44% and 34% of the analysed documents, respectively. In particular, actions related to cooling places, such as grey built-up structures and water features, appear only in more recent plans, mainly from 2015. Therefore, due to the current demand, it is urgent the readaptation of public spaces through the design of a network of refrigeration spaces distributed throughout the city.

**Keywords** - Climate Change, Climate Adaptation Plans, Heat Waves, Cooling Places.

## 1. Introduction

According to the United Nations Framework Convention on Climate Change (UNFCC), climate change is a phenomenon attributed directly and indirectly to human activity that modifies the global atmosphere composition that is beyond the natural climate variability which is already observed, creating changes in climatic pattern, rising global temperature average and extreme events attached to climate (IPCC, 2023).

Studies suggest that society will experience many impacts of climate change in the near future, over the next thirty years, and even more so in the second half of this century. Among these impacts, one that has significant implications for energy demand and the health of the population is the increase in the frequency and intensity of heat waves. Although there is no universally acceptable definition of heat waves (Perkins; Alexander, 2013) these are understood as periods of unusual hot and dry/humid weather lasting at least two to three days and having a noticeable impact on human activities. Over the duration of heat waves, not only daytime temperatures reach high values, but also night time temperatures, and humidity changes beyond the long-term average. Heat waves are relative to a climate location; the same weather conditions may constitute a heat wave in one place but not another (Stefanon et al., 2012).

Extreme heat conditions are becoming more frequent, increasing risks to human health and health systems. The main impacts have been recorded in places where extreme heat occurs in context with population aging, urbanization, urban heat island, and inequalities in health care (Fajersztajn et al., 2016). According to Zhao et al. (2019), climate change will increase the number of deaths linked to heat waves between 2031 and 2080, and Brazil is among the most affected countries.

As for extreme temperature events, these overload the human body by damaging the cardiovascular and respiratory systems, especially for the most fragile people such as the elderly, pregnant women, children up to 4 years old, and obese people, according to the World Health Organization (WHO,

2018). Cities are not the cause of heat waves; however, they potentiate their effects. Because of the large concentration of asphalt, concrete, stone, and other inert materials, cities end up absorbing and retaining more heat than rural areas (Stone, 2012), and are therefore more vulnerable to heat waves.

As for the vulnerable population, in 2018 about 220 million people under 65 years of age were exposed to heat waves, a higher figure compared to the period from 1986 to 2005 (WMO, 2020). It is worth noting, according to Diniz et al. (2020), that the projections made for the near future (2030 - 2050) and distant future (2059 - 2099) show that excess mortality of the elderly related to heat waves will increase, being higher when urban adaptation actions are not applied, especially for cardiovascular diseases in women (up to 587 deaths per 100,000 inhabitants/ year). In the Brazilian context, recent research indicates an increase in the frequency of heat waves over the years in different regions of the country under different climates. It is expected that by the end of the 21st century, with the increase in heat waves, the Brazilian Northeast region, due to its location and also affected by socioeconomic inequalities, will become the region most affected by intense heat (Geirinhas et al., 2017).

Importantly, urban areas have a dual role: besides housing much of the population, the present lifestyle is one of the main inducers of climate change, since cities are marked by excessive consumption, solid waste production, greenhouse gas emissions, intensive energy use, landscape fragmentation, soil sealing, predominance of inert and heat-absorbing materials, and other factors that intensify the effects of climate change. In this sense, the structuring of space, form of development and expansion of the urban fabric (Nobre, Young, 2011) added to the implementation of urban green infrastructure (Farrugia et al., 2013) are points to be considered. Urban green infrastructure can be interpreted as a hybrid of green spaces and built systems such as forests, wetlands, parks, green roofs and walls that together can contribute to ecosystem resilience and bring benefits to humans through ecosystem services (Naumann et al., 2021; European Environment Agency, 2022).

In view of the above, this work has the objective of systematizing the main national and subnational climate adaptation plans according to the criteria outlined in the document Measuring Benefits of Urban Heat Adaptation, published in March 2021 by the C40 Group of Major Cities for Climate Leadership (C40, 2021), highlighting the strategic role of urban planning and design in climate adaptation to the urban heat, looking mainly at the propositions for the creation of climate amenity spaces.

## 2. Methods

The analysis of the Climate Adaptation Plans was carried out in order to systematize them according to the criteria outlined in the document Measuring Benefits of Urban Heat Adaptation, published in March 2021 by the C40 Group of Major Cities for Climate Leadership (C40, 2021). Among the C40 criteria, this analysis was based on the temperature reduction potential of the proposed actions and feasibility of implementation, as follows:

- Cool surface: found on sidewalks and roofs, these are those that reduce energy absorption and capture as a result of the reflective capacity of the elements;
- Green infrastructure:

1. Urban parks: responsible for reducing the local urban temperature according to their size and canopy cover;
2. Green corridors: correspond to connected green spaces in order to direct the wind and promote biodiversity;
3. Vegetation, in general: corresponding to flowerbeds, bio-valets and green roofs.

- Urban form planning and design: according to the width of the streets, density, gauge, and materiality, it is possible to increase the albedo and consequently reduce the solar radiation stored on the urban surface.
- Heatwave response planning: corresponds to the policy of making the population aware of heat waves as well as action plans upon their occurrence in order to mitigate the effects generated by prolonged exposure to increased temperatures.
- Grey urban shading structures: corresponds to structures that provide shading, whose importance comes from the reduction of the amount of solar radiation captured and stored in the

urban surface and, therefore, reduction of air and surface temperature.

- Urban Water features: due to their greater ability to absorb solar radiation, when compared to inert materials, and to evaporative cooling, water bodies can reduce the air temperature of the surrounding area and promote greater thermal comfort.
- Wind corridors: through convection and evaporation, wind corridors can generate temperature reduction.

In addition to these criteria, this analysis included the search for the proposition and design of cooling places, as spaces of climate amenities distributed in a targeted manner throughout the city in order to assist the population during extreme heat.

It is worth noting the absence of conceptualization and specific literature on this topic, since the understanding about cooling places comes according to the local reality. The definition found is the one applied in Climate Adaptation Plans of developed countries such as the United States and Australia, in which the cooling places are mainly public or private air-conditioned buildings, able to receive the population, and where people are guided to go during extreme heat, besides some open spaces such as parks, public pools, squares with access to water, etc.

In total, 259 documents were analysed (Table 1). These documents encompass: i) municipal plans, ii) regional plans: preferably, administrative divisions corresponding to states and capitals; iii) documents available in official electronic portals; iv) cities mentioned in the consulted bibliographical references, so that there is a better understanding about the local conditions and possible similarities. This research was carried out based on municipal websites and specific websites related to climate change.

## 3. Results

Out of 259 of documents raised, 17 are from cities in Africa, 126 from America, 63 from Asia, 38 from Europe and 7 from Oceania; circa 68% correspond to Climate Adaptation Plans, as defined by Obermaier and Rosa (2013), with delimitation of the guidelines aimed at the local reality. Already 8% fit the pattern of booklets that, according to the IAUC (2020), are documents with education character that address the basic concepts on the subject and are not restricted to the existing local demands.

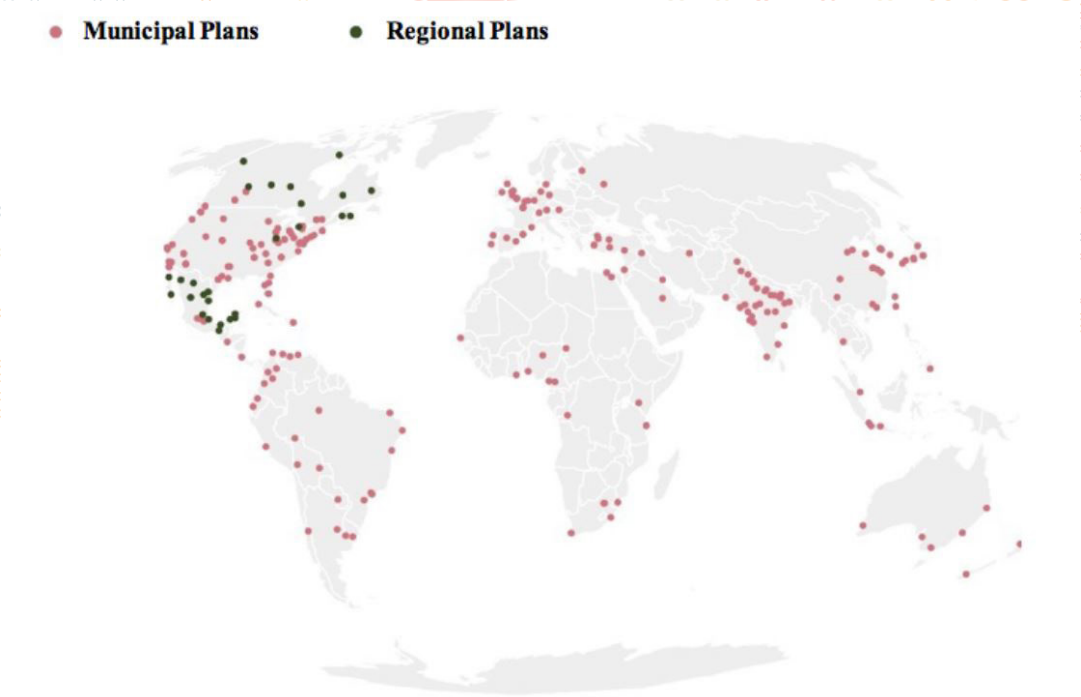


*Figure 1: Spatialization of Climate Adaptation Plans: out of 259 of documents raised, 17 are from cities in Africa, 126 from America, 63 from Asia, 38 from Europe and 7 from Oceania (Authors, 2023; Infographics by Nicholas Pretto)*

From the analysis of the above-mentioned plans, it was possible to understand the spatial distribution of the plans (Figure 1), which are more frequent in developed countries, especially in the USA. In addition, it was possible to draw an overview of the main issues dealt with in the Climate Adaptation Plans and similar documents (Figure 2 and 3). In Figure 2, through the bar graph, it is possible to understand the geographic Distribution of the analyzed documents as well as their publication period. Through Figure 3, it is possible to understand the mention of strategies.

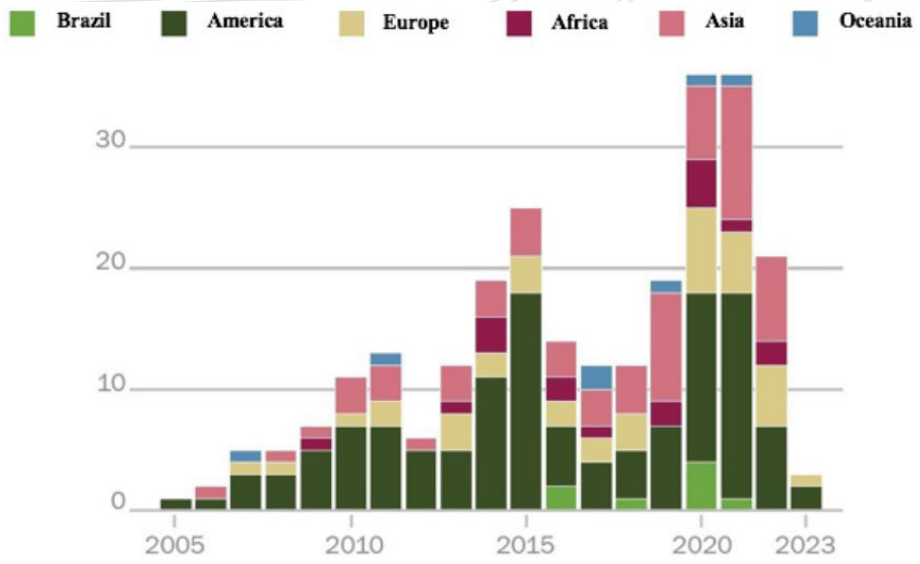


*Figure 2: Geographic distribution of Climate Adaptation Plans (Authors, 2023; Infographics by Nicholas Pretto)*

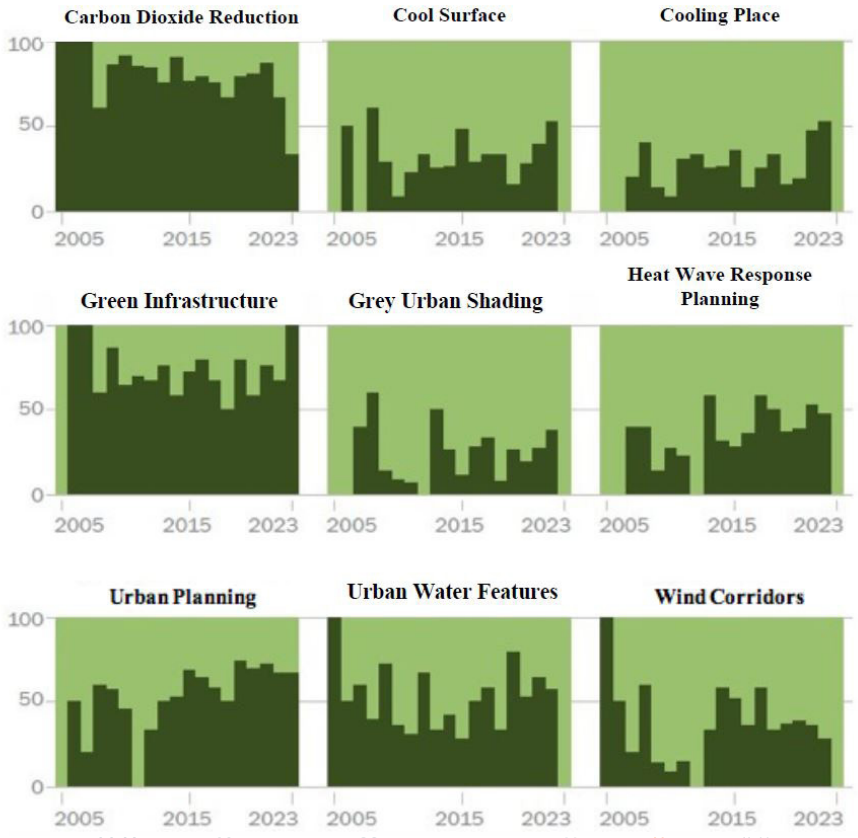


*Figure 2: Geographic distribution of Climate Adaptation Plans (Authors, 2023; Infographics by Nicholas Pretto)*

## 4. Discussion

Among the actions posed by the C40, the mention refers to reducing the emission of greenhouse gases, such as CO2, stands out. However, it is known that the concern with the urban environment should not be restricted to mitigation measures, but also address adaptive measures of cities in the face of climate change (Duarte, 2019).

The second most mentioned action is related to green infrastructure (75%). Despite predominant, the level of detail given to this action fluctuates too much and three different approach patterns were found: i) only mention the importance of the vegetation for alleviating thermal stress; ii) indication of guidelines for urban parks, urban vegetation and green corridors; iii) reference to green infrastructure plans based on the demand mentioned in the analysed documents.

For example: i) in the Strategic Focus Area Plan for the city of Charlotte, USA, the importance of planting trees as a strategy for maintaining community resources is highlighted, but guidelines for these plantations are not outlined; ii) in Guide to Urban Cooling Strategies referring to Australia, in addition to pointing out practical alternatives arising from green infrastructure, they show how vegetation can contribute to the reduction of thermal stress; iii) in Chicago Climate Action Plan, USA, other documents, such as the Urban Forest Agenda and the Chicago Trees Initiative, are mentioned. It was considered important to highlight two other actions: heatwave response planning and cooling places, mentioned in only 44% and 34% of the analysed documents, respectively. There is a relationship between these actions, for example, warning systems triggered in cases of heat waves as part of the Excessive Heat Plan (Philadelphia Hot Weather - Health Watch Warning System). In this program, municipal teams work together with the National Weather Service to determine the heat wave and the consequent alert when they are hit.

Thus, there is guidance for people to go to places determined as cooling places, which are located through an interactive map available on the internet, the Stay Cool Interactive Map. On this map there is an indication of places with milder microclimates for these become temporary refuges until there is recovery from the thermal stress caused by the constant above-average temperatures for prolonged periods. When analysing the existing climate adaptation plans, it can be noted that many of them recommend that people seek air-conditioned spaces as a way to recover from excessive and prolonged heat.

As for the actions related to urban planning and design strategies, 70% of the plans mention them, whose level of detail, as well as for green infrastructure, varies a lot. As an example, for this action, the Hong Kong's Climate Action Plan 2030+ is cited, which highlights the direct relationship between the reduction of air and surface temperature according to urban morphology and urban parameters, such as the minimum setback in urban lots and the shape of buildings.

## 5. Conclusion

Analysing the results of this research, it is possible to observe that there is a recent need - mainly in the last 10 years, with emphasis on the period after 2020 - for the development of climate adaptation plans, with most of the climate adaption documents found in developed countries. In the last 10 years, there has been a strong movement in the Asian continent. These plans aim to reduce the impacts generated by climate change and advance the understanding of the subject and the implementation of practical measures that minimize the expected impacts.

Despite this, part of the documents found can be classified as primers, as they approach the topic superficially and have an education rather than a performance or prescriptive nature. Most of these documents lack important details and may not be applicable to reality.

It is noted the prevalence of green infrastructure, actions related to urban morphology and reduction of greenhouse gas emissions, the first two aspects being climate adaptation actions, while the last one is aimed at mitigating climate change. The actions related to cooling places, grey urban built-up structures and urban water features, it was observed that these are less frequent in the survey and it appears only in more recent plans, being first mentioned in 2015.

Due to the current demand and the need for measures aimed at climate adaptation, the urgency needs to readapt public spaces through the design of a network of cooling places distributed throughout the city. Cooling places must be designed in accordance to local reality and might be interesting to be associated with green infrastructure and better developed with urban morphology actions in order to alleviate the thermal stress generated by heat waves.

## 6. Acknowledgements

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## 7. References

C40 Cities Climate Leadership Group, 2021. Heat Resilient Cities: Measuring benefits of urban heat adaptation. In: Ramboll Foundation.

Diniz, F., 2020. Ondas de calor e mortalidade de idosos: Projeções para o Brasil nos cenários das mudanças climáticas (USP 60+). São Paulo: Universidade de São Paulo - Instituto de Astronomia, Geofísica e Ciências
Atmosféricas,

Duarte, D., 2015. O Impacto da Vegetação no Microclima em cidades adensadas e seu papel na adaptação aos fenômenos de Aquecimento Urbano: Contribuições a uma abordagem interdisciplinar. 2015. Tese (Livre- docência em Arquitetura e Urbanismo), Faculdade de Arquitetura e Urbanismo, Universidade de São Paulo, São Paulo.

European Environment Agency, 2012. European Union (org.). Climate change adaptation.

Fajersztajn, L.; Veras, M.; Saldiva, P., 2016. Como As Cidades Podem Favorecer ou Dificultar a Promoção da Saúde de seus Moradores? Estudos Avançados, São Paulo, v. 30, n. 86, p. 7-27.

Farrugia, S..; Malcolm, D.; Mccculloch, L., 2013. An evaluation of flood control and urban cooling ecosystem services delivered by urban green infrastructure, International Journal of Biodiversity Science, Ecosystem Services and Management v.9 p 136-145.

Geirinhas, J.; Trigo, R.; Libonati, R.; Coelho, C.; Palmeira, A., 2017. Climatic and synoptic characterization of heat waves in Brazil. International Journal of Climatology, [s. l.], n. 38, p. 1760 – 1776.

IAUC (Internacional Association for Urban Climate), 2020. From the IAUC President. Quarterly Newsletter of the IAUC. Issue n. 76.

IPCC (Intergovenmental Panel on Climate Change), 2023. Special Report - AR6 Synthesis Report: Climate Change. IPCC Working Group I Techinal Suport Unit.

Naumann, S..; Anzaldua, G..; Gerdes, H. et al, 2011. Assessment of the potential of ecosystem-based approaches to climate change adaptation and mitigation in Europe. 2011. Ecologic institute and Environmental Change Institute, p 29-40.

Nobre, C; Young, A. Vulnerabilidade das Megacidades Brasileiras Mudanças climáticas: Região metropolitana de São Paulo. Relatório Final. 2011.

Obermaier, M.; Rosa, L. Mudança climática e adaptação no Brasil: uma análise crítica. Estudos avançados, v. 27, n. 78, 2013.

Perkins, S. E.; Alexander, L. V. On the Measurement of Heat Waves. Journal of Climate, [S.L.], v. 26, n. 13, p. 4500-4517, 1 jul. 2013. American Meteorological Society.

Rosenthal, J., Kinney, P., Metzger, B. Intra-urban vulnerability to heatrelated mortality in New York City, 1997– 2006. Health & Place, 30, 45–60, 2014.

Stefanon, M.; D'andrea, F.; Drobinski, P. Heatwave classification over Europe and the Mediterranean region. Environmental Research Letters, [S.L.], v. 7, n. 1, p. 014023, 22 fev. 2012. IOP Publishing.

Stone Jr., B. The city and the coming climate. Climate Changes in the Places we live. New York: Cambridge, 2012.

Tsuda, F. Conforto, adequação climática e o papel dos códigos de edificações: os desafios de São Paulo frente ao estado da arte no Brasil e no mundo. 2019. Dissertação (Mestrado em Arquitetura e Urbanismo) – Faculdade de Arquitetura e Urbanismo, Universidade de São Paulo, São Paulo, 2019.

WMO (World Meteorological Organization) Earth experienced the warmest June on record. 2018.

Zhao, Q.; Li, S.; Coelho, M.; Saldiva, P.; Hu, K.; Huxley, R.; Abramson, M.; Guo, Y. The association between heatwaves and risk of hospitalization in Brazil: A nationwide time series study between 2000 and 2015. In: PLOS Medicine, 2019.

## 8. Appendix

### 8.1. Analyzed documents

*Table 1: Table with list of analyzed documents – Part 1 (Authors, 2023)*

| CLIMATE ADAPTATION PLANS | YEAR OF PUBLICATION | CITY | COUNTRY |
|---|---|---|---|
| **AMERICA** | | | |
| Plan de Acción sobre el Cambio Climático 2021-25 | 2021 | Buenos Aires | Argentina |
| Plano Municipal de Mitigação e Adaptação às Mudanças do Clima de Rio Branco | 2020 | Rio Branco | Brazil |
| Plano de Ação Climática | 2020 | Salvador | Brazil |
| Plano Local de Ação Climática da Cidade de Fortaleza | 2020 | Fortaleza | Brazil |
| Plano de Mitigação e Adaptação às Mudanças Climáticas | 2020 | Curitiba | Brazil |
| Goiânia Sustentável | 2011 | Goiânia | Brazil |
| Plano Local de Ação Climática | 2022 | Belo Horizonte | Brazil |
| Plano de Ação Climática | 2023 | João Pessoa | Brazil |
| Plano Local de Ação Climática da Cidade de Recife | 2020 | Recife | Brazil |
| Plano de Ação Climática da Cidade de Teresina | 2023 | Teresina | Brazil |
| Plano de Desenvolvimento Sustentável e Ação Climática | 2021 | Rio de Janeiro | Brazil |
| Plan Clima SP | 2021 | São Paulo | Brazil |
| Plano de Resiliência de Aracaju 2017-2024 | 2017 | Aracaju | Brazil |
| Climate Change Strategy | 2008 | Alberta | Canada |
| Calgary Climate Strategy | 2022 | Calgary | Canada |
| Climate Resilient Edmonton | 2018 | Edmonton | Canada |
| Strategic Plan Mississauga | 2009 | Mississauga | Canada |
| Montreal_Management of the Climate Change Adaptation Plan | 2017 | Montréal | Canada |
| Climate Change Action Plan | 2014 | New Brunswick | Canada |
| The Way Forward on Climate Change | 2019 | oundland and Labr | Canada |
| Climate Change Impacts and Adaptation in Nunavut | 2011 | Nunavut | Canada |
| Climate Change Strategy | 2015 | Ontario | Canada |
| Climate Change Master Plan | 2020 | Ottawa | Canada |
| A Strategy for Reducing the Impacts of Global Warming | 2008 | rince Edward Islan | Canada |
| Climate Change Action Plan | 2013 | Quebec | Canada |
| TransformTO - City of Toronto | 2021 | Toronto | Canada |
| Climate Change Adaptation Strategy | 2018 | Vancouver | Canada |
| Community Climate Adaptation Plan for Waterloo Region | 2020 | Waterloo Region | Canada |
| A Sustainable Winnipeg | 2011 | Winnipeg | Canada |
| Climate Change Action Plan | 2009 | Yukon | Canada |
| Regional Climate Change Adaptation Plan | 2019 | Santiago | Chile |
| Mitigácion a La Variabilidad y El Cambio Climático | 2013 | Bogotá | Colombia |
| Climate Adaptation Plan for Medellín 2020-2050 | 2020 | Medellín | Colombia |
| Green Vision | 2008 | San Jose | Costa Rica |
| Adaptation Plan for the Havana Coastal Zone | 2019 | Havana | Cuba |
| Planning-for-Climate-Adaptation | 2018 | Santo Domingo | Dominican Republic |
| Climate Action Plan | 2021 | Quito | Ecuador |
| Climate Action Plan | 2020 | San Salvador | El Salvador |
| Programa de Acción ante el Cambio Climático del Estado de Chiapas | 2010 | Chiapas | Mexico |
| Climate Action Program | 2014 | Mexico City | Mexico |
| Plan de Adaptacion del municipio de Puebla | 2012 | Puebla | Mexico |
| Climate Change Action Plan Overview | 2009 | Veracruz | Mexico |
| Recommendations of Actions for Resilience and Sustainability | 2020 | Asunción | Paraguay |
| Climate Action Plan | 2015 | Atlanta | United States of America |
| Climate Change Adaptation in Austin's Community Forest and Natural Areas | 2014 | Austin | United States of America |
| Baltimore County Climate Action Plan | 2021 | Baltimore | United States of America |
| Climate Ready Boston. Municipal Vulnerability to Climate Change | 2019 | Boston | United States of America |
| Bozeman Climate Plan | 2021 | Bozeman | United States of America |
| BGreen 2020 A Sustainability Plan for Bridgeport, Connecticut | 2020 | Bridgeport | United States of America |

| CLIMATE ADAPTATION PLANS | YEAR OF PUBLICATION | CITY | COUNTRY |
|---|---|---|---|
| Resilient-Buffalo-Niagara | 2020 | Buffalo | United States of America |
| Towards Resilience | 2018 | Charlotte | United States of America |
| Climate Action Plan | 2022 | Chicago | United States of America |
| Climate Action Plan | 2013 | Cleveland | United States of America |
| Climate Action Plan | 2020 | Columbus | United States of America |
| City Environmental & Climate | 2019 | Dallas | United States of America |
| Climate Action Plan | 2021 | Delaware | United States of America |
| Denver 2015 Climate Action Plan | 2015 | Denver | United States of America |
| Sustainability Action Agenda | 2013 | Detroit | United States of America |
| Fort Worth 2010 Sustainability Task Force Recommendations | 2010 | Fort Worth | United States of America |
| Climate Action Plan | 2020 | Houston | United States of America |
| Climate Change Roadmap | 2020 | Indiana | United States of America |
| Adaptation Action Area Workgroup Workgroup Recommendations | 2019 | Jacksonville | United States of America |
| Climate-Risk-and-Vulnerability-Assessment | 2019 | Kansas City | United States of America |
| Las Vegas Global Economic Alliance | 2021 | Las Vegas | United States of America |
| 2045 Climate Action Plan | 2023 | Los Angeles | United States of America |
| Climate Action Plan | 2020 | Memphis | United States of America |
| Climate Action Strategy | 2021 | Miami | United States of America |
| ECO Presentation to Governor's Climate Task Force | 2020 | Milwaukee | United States of America |
| Minneapolis Climate Action Plan | 2013 | Minneapolis | United States of America |
| A General Plan for Nashville and Davidson County | 2015 | Nashville | United States of America |
| Climate Change at NYC | 2021 | New York City | United States of America |
| Community Action Plan | 2018 | Orlando | United States of America |
| Philadelphia Climate Action | 2021 | Philadelphia | United States of America |
| Climate Action Plan | 2021 | Phoenix | United States of America |
| Climate Action Plan 3.0 | 2017 | Pittsburgh | United States of America |
| Bureau of Planning and Sustainability | 2021 | Portland | United States of America |
| Climate Adaptation and Resiliency | 2019 | Riverside | United States of America |
| Sacramento Climate Action & Adaptation Plan | 2022 | Sacramento | United States of America |
| Climate Adaptation Plan | 2021 | Salt Lake City | United States of America |
| Climate Ready. A Pathway for Climate Action and Adaptation | 2019 | San Antonio | United States of America |
| Climate Action Plan | 2022 | San Diego | United States of America |
| San Francisco's Action Plan | 2021 | San Francisco | United States of America |
| Coastal Adaptation and Resilience in Tampa Bay | 2015 | Tampa | United States of America |
| Virginia Coastal Resilience Master Plan | 2021 | Virginia Beach | United States of America |
| DNR's Plan for Climate Resilience | 2020 | Washington DC | United States of America |
| Wisconsin Climate and Health Adaptation Plan | 2016 | Wisconsin | United States of America |

*Table 2: Table with list of analyzed documents – Part 1 (Authors, 2023)*

| CLIMATE ADAPTATION PLANS | YEAR OF PUBLICATION | CITY | COUNTRY |
|---|---|---|---|
| **AFRICA** | | | |
| Resilience Strategy | 2020 | Accra | Ghana |
| Environmental Action Plan | 2009 | Alexandria | Egypt |
| Climate Change Policy | 2017 | Cape Town | South Africa |
| Territorial Climate Energy Plan of Dakar | 2021 | Dakar | Senegal |
| Dar es Salaam City Master Plan 2016-2036 | 2016 | Dar es Salaam | Tanzania |
| Framework for Municipal Adaptation Plan. Case study of Douala V Municipality | 2018 | Douala | Cameroon |
| Durban Climate Change Strategy | 2014 | Durban | South Africa |
| Ekurhuleni Metropolitan Municipality. Corporate Disaster Management Plan | 2013 | Ekurhuleni | South Africa |
| Climate Change Adaptation. Plan for the City of Johannesburg | 2021 | Johannesburg | South Africa |
| Resilience Strategy | 2020 | Lagos | Nigeria |
| Voluntary Local Review | 2020 | Yaoundé | Cameroon |
| Nairobi Climate Action Plan 2020-2050 | 2020 | Nairobi | Kenya |
| **ASIA** | | | |
| Climate Change and Environment Action Plan of Ahmedabad District | 2022 | Ahmadabad | India |
| Amman Green City Action Plan | 2021 | Amman | Jordan |
| Bangkok Assessment Report on Climate Change | 2009 | Bangkok | Thailand |
| Climate Change and Environment Action Plan of Bhopal District | 2022 | Bhopal | India |
| Resilience Chennai Strategy | 2019 | Chennai | India |
| Comprehensive Development Plan 2018-2022 | 2018 | Davao | Philippines |
| Climate Action Plan 2030+ | 2020 | Hong Kong | China |
| Climate Change and Environment Action Plan of Indore District | 2022 | Indore | India |
| Urban Challenges in a Changing Climate | 2011 | Jakarta | Indonesia |
| Karachi City Climate Change | 2012 | Karachi | Pakistan |
| City Lab Kochi | 2020 | Kochi | India |
| Implementation of the 2030 Agenda | 2019 | Kuwait City | Kuwait |
| Climate Action Plan | 2022 | Mumbai | India |
| Climate Change and Environment Action Plan of Nagpur District | 2022 | Nagpur | India |
| City Climate Action Plan | 2021 | New Delhi | India |
| Resilience Accelerator | 2019 | Pune | India |
| Ten Year Plan 2021-31 | 2021 | Queenstown | Singapore |
| Climate Resilience City Action Plan | 2018 | Rajkot | India |
| Semarang Climate Change Resilience Strategy | 2011 | Semarang | Indonesia |
| A Guide for Sustainable Urban Development | 2010 | Shanghai | China |
| Preparing for a Climate Resilient Singapore | 2021 | Singapore | Singapore |
| Smart City Srinagar Report | 2016 | Srinagar | India |
| Surat Resilience Strategy. Resilient Cities Network | 2017 | Surat | India |
| Suwon Action Report | 2020 | Suwon | South Korea |
| Towards a Net Zero Future | 2021 | Taipei | Taiwan |
| Tokyo Climate Adaption Plan | 2019 | Tokyo | Japan |
| **EUROPE** | | | |
| Climate Emergency Action Plan | 2022 | London | United Kingdom |
| Paris Climate and Energy Action Plan_2012 | 2013 | Paris | France |
| Copenhagen Climate Plan | 2015 | Copenhagen | Denmark |
| Ankara Climate Change Action Plan | 2022 | Ankara | Turkey |

| CLIMATE ADAPTATION PLANS | YEAR OF PUBLICATION | CITY | COUNTRY |
|---|---|---|---|
| Plan Clima | 2018 | Barcelona | Spain |
| Climate Plan for the territory of the City of Brussels | 2022 | Bruxelles | Belgium |
| Bursa Sustainable Energy and Climate Change Adaptation Plan | 2017 | Bursa | Turkey |
| The perspectives of Cologne 2030+ | 2021 | Cologne | Germany |
| Climate Change Action Plan of Gaziante | 2023 | Gaziantep | Turkey |
| Berlin's Climate Action and Adaptation Planning | 2016 | Berlin | Germany |
| Local Climate Change Governance | 2011 | Hamburg | Germany |
| Dublin City Council's Climate Change Action Plan 2019-2024 | 2019 | Dublin | Ireland |
| Istanbul Climate Change Action Plan | 2018 | Istanbul | Turkey |
| Izmir Green City Action Plan | 2020 | Izmir | Turkey |
| Lille: action plan for a low carbon city | 2014 | Lille | France |
| European Green Capital | 2020 | Lisbon | Portugal |
| Roadmap to climate neutrality by 2050 | 2020 | Madrid | Spain |
| Marseille's Path to a Greener Future | 2021 | Marseille | France |
| Climate Action Plan | 2022 | Moscow | Russia |
| Munich: Future Perspective | 2013 | Munich | Germany |
| Adapting to Climate Change in Vienna | 2018 | Vienna | Austria |
| Glasgow Climate Adaptation Plan 2022 - 2030 | 2022 | Glasgow | United Kingdom |
| Climate Change Adaptation Action Plan 2012+ | 2011 | Birmingham | United Kingdom |
| Valencia 2030 Climate Mission | 2021 | Valencia | Spain |
| Municipality Sustainable Energy and Climate Action Plan | 2021 | Karşıyaka | Turkey |
| **OCEANIA** | | | |
| City of Melbourne Climate ChangeAdaptation Strategy and Action Plan | 2019 | Melbourne | Australia |
| Adapting for Climate Change | 2016 | Sydney | Australia |
| Climate Change Adaptation Action Plan 2011-2013 | 2016 | Adelaide | Australia |