

MOTIVATIONS FOR RESILIENT CITIES HOW CAN PORTO ALEGRE (BRAZIL) BECOME ONE?

FERNANDA LUTZ

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

fernandaglutz@gmail.com

ANDERSON COUGO DA CRUZ

UNIVERSIDADE FEDERAL DE SANTA MARIA

adm.cougo@gmail.com

MOTIVATIONS FOR RESILIENT CITIES: HOW CAN PORTO ALEGRE (BRAZIL) BECOME ONE?

ABSTRACT:

The next generation of cities will be different from those in the past, which requires a review of conventional means of solving problems. In this context, there's been a mismatch between the growth of cities and their infrastructures, generating an increase in the complexity of the problems to be solved in society. An analysis of urban mobility, preservation of environmental resources and sustainability can help us to understand part of the steps required for cities to overcome these difficulties.

This urbanization and an understanding of the need to preserve environmental resources requires an awareness of society as a whole, which needs to reflect the importance of sustainable development for the future to provide better living conditions for its people in the process of developing cities. Development, no longer basically social and economic, must now be aligned with environmental development, shifting the focus of institutions, based mainly on economic factors, to sustainable societal factors, seeking solutions that enable economic and ecological spheres.

The purpose of this paper was to contribute to the sustainable development in the city of Porto Alegre and provide lessons that could be apply, using San Francisco as a model of resilient city.

KEYWORDS: Resilient Cities; Sustainable Development; Sustainability.

1. INTRODUCTION

Over the last century, cities are becoming the focus of a globally integrated society. The urbanization in developing countries exceeds the cities current capacities and there's a need to achieve more economically prosperous, environmentally sustainable and socially equitable way to survive.

As they grow in numbers and population, cities are having more economic, political and technological power than ever before. The actions of the actors can result in more resilient organizations that endure abruption and recover more quickly.

According to the UNISDR (2017), in 2050 more than 70% of the world's population will be living in cities. Therefore, it is essential that cities become prepared to offer basic and environmental services, green spaces and preservation of natural resources that guarantee the survival of the population and can lead the way into a prosperous and sustainable future.

Resiliency can be described as the ability of an ecosystem to return to its original state after being disturbed. The power to return to the original form, position, after being bent, compressed, or stretched. This old view of resilience, the regress to an equilibrium condition, is not appropriate to cities and urban regions anymore. Nowadays resilience can be seen as the ability of a system to adjust in the face of changing condition, especially after sudden shocks in the external environment and it's an area of interest to policy makers. The lack of resilience makes cities more vulnerable to economic, social, and ecological risks (UNISDR, 2017).

Cities around the world are realizing that their performance does not depend just on the city's size of population, production and infrastructure, but on the availability and communication of knowledge and their social and intellectual capital (KEN, 2017).

In this context, the concept of "resilient cities" emerged, suggesting cities of power, adaptability and flexibility. A city that uses resilience in its favor can engage planners, ecologists, and all the public, to emphasize its dynamics. The community needs to rethink existing theories of urban politics.

At a community level, resilience means how vulnerable, prepared and adaptable the community is at finding solutions to problems, providing communication and information systems, encouraging diversity in economic development, and developing connections.

The adoption of sustainable development practices, strategies and systems to protect the cities for the next generations, has fundamentally changed different aspects of the cities to ensure diffusion and adoption of new sustainable technologies. Sustainability is associated with business models that attempt to minimize negative externalities, whereas resilience exists.

The reorganization of urban governance has an effect on the actors and is a key to sustainable urban development.

Purpose: To suggest practices and politics to became Porto Alegre a more resilient city, from the case of San Francisco, according to its context.

- A. To identify the main practices and politics that made San Francisco to be recognized as a world model of resilient city;
- B. To compare the reality (sociodemographic indices) of both cities;
- C. To elaborate a list of recommended practices and politics that Porto Alegre could apply to become a more resilient city.

In order to prove the relevance of the subject, both cities are on the Rockefeller Foundation's 100 Resilient Cities list. According to UNISDR, San Francisco is already a leader in sustainability, having been named the greenest city in North America by Siemens Green City Index in 2011. (SIEMENS, 2017; UNISDR, 2017).

San Francisco is also a world leader in innovation, in social justice advocacy, in livable and sustainable urbanism. The city is located in a coastal climate zone and has recognized the growing threat it faces with global climate change. Each city has its own approach in resilience-building, but all cities have threads with the uncertain future. Working together, cities may find new solutions to address the challenges they face.

2. SUSTAINABILITY AND RESILIENT CITIES

An analysis of urban mobility, preservation of environmental resources and sustainability can help us to understand the steps necessary for Porto Alegre to have sustainable development on its way to resilience.

Urban sustainability is conceptualized as the ability of urban policies to adapt to the supply of services, quality and quantity of social demands, seeking a balance between the demands of urban services and investments in infrastructure (ACSELRAD, 1999).

Sustainable development is a long-term social learning process driven by public policies guided by a national development plan. However, the diversity of social actors and the interests present in society become an obstacle for public policies to find sustainable development (Bezerra and Bursztyn, 2000).

The increase in popular participation in urban development and its environmental impacts has resulted in a search for education and environmental information in different localities. In addition to increasing demand for sustainable practices, society has assumed co-responsibility in relation to government agencies in the development and management systems of its municipalities.

According to Satterthwaite (2004), sustainability is defined as the response to human needs in cities with minimal or no transfer of costs of production, consumption or waste to other people or ecosystems, today and in the future.

To achieve global urban development, practical actions are needed that reach goals through broadly inclusive solutions and adapting the community to new times. Through information, knowledge and behavioral changes, citizens increasingly understand that they

can interfere in the future of their cities, managing environmental resources, with common strategies that cover the entire city, thus seeking solutions for current and future generations.

According to Menegat and Almeida (2004), no environmental management plan will succeed without the participation of citizens and this will be both greater and more qualified as more information about the environment is available. Large-scale environmental education can then help its population to understand the existing problems and then seek solutions through different forms of participation and decision in the direction of the city.

According to Vargas (2008) urban mobility is defined as the ability to move people and goods in urban space to perform their daily activities, in a time considered ideal, in a comfortable and safe way. Urban mobility addresses how to organize flows in the city and how best to ensure people's access to the disorderly growth of the city.

World Resources Institute (WRI), a global research organization that spans more than 50 countries, works closely with leaders to turn ideas into action to sustain natural resources. According to WRI (2017), cities will need to innovate how they deliver sustainable urban services to meet people's needs. "Urban services are typically considered the responsibility of the public sector. But growing urban populations and constrained public finance mean that the public sector cannot deliver successful services entirely on its own. Many urban innovations are the result of shifting roles and responsibilities between public, private, and civil society actors, including people."

3. THE CITIES

3.1 Porto Alegre

Porto Alegre is the capital of the southernmost state of Brazil, Rio Grande do Sul. With an area of almost 500 km², it has a diverse geography, with hills, lowlands and a large lake, Guaíba. Today it holds one of the best qualities of life in the country.

The city was founded on March 26, 1772, from the arrival of Azorean families. During the nineteenth century, started the forthcoming from many German, Italian, Spaniards, Africans, Lebanese and Poles immigrants. European citizens have favored the rapid development of the region, which now houses more than 1.4 million inhabitants (PORTO ALEGRE, 2017).

Due to its development in the XX century, Porto Alegre stood out among the other cities of the state, projecting itself in the national scenario. The city has been highlighted by the UN as Metropolis No. 1 in quality of life in Brazil three times. Besides the strong economic potential, the city shows attention to other issues, such as environmental matter. The capital is one of the most wooded and literate in the country, a pole of attraction for immigrants in search of better quality of life, work and education (PORTO ALEGRE, 2017).

According to Porto Alegre (2017), the city owns a rich and qualified culture, with intense activity in almost all areas of the arts, sports and sciences, besides having a diversified

folkloric tradition and a significant historical patrimony in centenary constructions and numerous museums. Although it has one of the best Human Development Indexes (HDI) among the country's metropolitan areas and is a major economic hub, the city faces many challenges. Poverty, sub-housing, high cost of living, high incidence of obesity and smoking, incipient basic sanitation, pollution, high crime rates and growing traffic problems are some of them.

Some part of the territory of the capital is distributed in 16 islands of Guaíba Lake. The lake surrounds the city for a length of 70 km. The set of islands, preservation areas and parks, added to the rural area and the afforestation of public roads, make Porto Alegre a green and clean city. In the 2010 Census has compiled a ranking of the indices of afforestation in all Brazilian cities. For this, the agents observed the number of trees in the street (block) where the domicile was and, if they existed, if they were near the residence: of the fifteen Brazilian cities with more than one million inhabitants, Porto Alegre (RS) was in fifth place with 82.9% (IBGE, 2010).

The Municipal Environment Secretariat is one of the executive bodies of Porto Alegre. Created in 1976, SMAM (Secretaria Municipal do Meio Ambiente) was the country's first environment secretary. It is responsible for the protection of the natural system and the control of environmental quality in the municipality. Historically, SMAM prioritized the expansion and management of urban green areas. Since the nineties, it has been structured to promote policies to protect the impacted environment and control impacting activities (SMAM, 2017).

The city launched a Resilience Strategy to integrate resilience into the city's planning, which lays out goals like improved land regulation, increased access to sustainable mobility options, and participatory budgeting. Developed over two years, the Strategy involved more than 500 city stakeholders, community leaders, entrepreneurs, universities, public authorities and the social sector. The commitment to the goal of establishing Porto Alegre as a model city for resilience in Latin America by 2022, 250 years after the city's founding.

To build the Porto Alegre of the future, the city needs to act in its today's vulnerabilities and achieve the goal of a sustainable future. Since 2012, the city gained the BikePoa system, a public bicycle rental service, with 400 bicycles and 40 stations in various parts of the capital, such as universities, tourist attractions, attractiveness poles, and public transport stations. Almost 200 thousand residents are registered in the service (EPTC, 2017).

The city still has a lack of sidewalks, poor conservation of the existing ones, absence of more cycle lanes and exclusive lanes for public transportation in many areas, as factors that favor low adhesion to collective public transport, bicycle use and footpaths.

Another initiative in the city is Datapoa (2017), an open source platform, which anyone in possession of information to share may contribute to the collaborative effort to compile data. In its mobility sector, four data sets are created related to traffic accidents, public transport, bus service, and Bike PoA. Ultimately, the goal of the platform is to identify the city's weaknesses and create solutions to improve services – including improved public transport and non-motorized transport infrastructure. Datapoa reflects a broader attempt in the field of urban development to tap into the wealth of information urban residents possess about their city (DATAPOA, 2017).

3.2 San Francisco

Founded in 1776, according to the UNISDR (2017), San Francisco is considered a leader in sustainability, having been named the greenest city in North America by Siemens Green City Index in 2011. The city is located in a coastal climate zone and has recognized the growing threat it faces with global climate change. The population is approximately 850.000 inhabitants at the city (SIEMENS, 2011).

San Francisco was one of the cities selected in the 100RC initiative (One Hundred Resilient Cities, pioneered by The Rockefeller Foundation) which is dedicated to help cities around the world become more resilient to the physical, social and economic challenges in the 21st century. It supports the adoption and incorporation of a view of resilience (100 RESILIENT CITIES, 2017).

With an uncertain global future, a changing climate, growing unaffordability and inequality, and the certainty of a powerful earthquake, San Francisco is building a stronger, more equitable and prepared city. The city's leaders have met and worked with government agencies, community-based organizations and private sector partners, to develop an actionable strategy aimed at understanding and then advancing urban resilience in San Francisco. . Workshops with partners, community groups and city officials allowed experts within individual fields, departments and policy areas to add their understanding of resilience, leveraged expertise, built relationships and the needs of the city to the process (SFGSA, 2017).

San Francisco is a worldwide tourist destination, with world's largest financial institutions located in it and a technology hub. The city has a history of devastating earthquakes and fires. The city's innovative use of financing and building codes has improved safety, and their use of social media to educate and motivate the public has influenced residents to take important steps in advancing their personal resilience (100 RESILIENT CITIES, 2017).

4. METHOD

This study presents theoretical assumptions that support a qualitative approach, by an exploratory and descriptive research.

Primarily, it is composed by a documental analysis for a theoretical referential about this archetype. Secondly, by a bibliometric analysis at Scopus, Springer Link and Web of Science databases, searching for international scientific articles according to the main terms "resilient city"AND"San Francisco" and "resilient city"AND"Porto Alegre", during the past 5 years.

Thus, the cities' characteristics were presented, in order to observe and identify what ones from San Francisco are considered more relevant for inspiring new or motivate developed initiatives in Porto Alegre, as resilient city. The procedure of this study was represented by some great area of Sustainability as input. Then, this ideas and approaches for

cities and development until the subject "resilient city", represented by two ones ranked by 100 Resilient Cities (2017): San Francisco (commonly chosen as a model of resilient and innovative city) and Porto Alegre. Therefore, to list San Francisco initiatives that could be implemented in Porto Alegre, as an output, the list of politics and practices from this American city that could inspire the Brazilian city (figure 1).

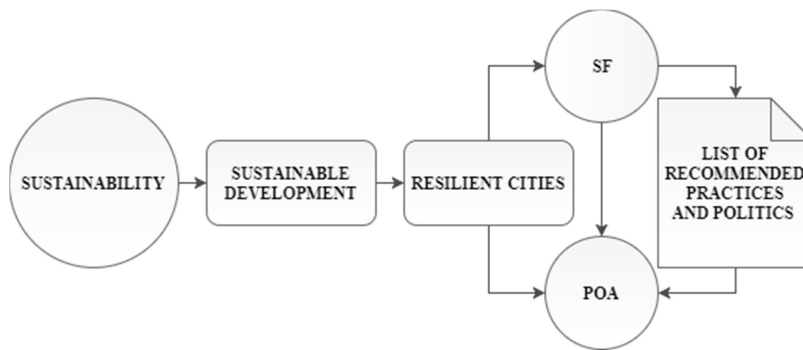


Figure 1: Research framework. Font: Elaborated by authors, 2017.

According to it was possible to achieve the predefined purpose and objectives of this research.

5. ANALYSIS AND DISCUSSIONS

5.1 Bibliometric Analysis

In this analysis, were found 17 articles, in English language, between the relation "Resilient City"AND"San Francisco". As contributions, all researches about physical and geographical subjects about resilience address natural disasters, such as earthquakes, hurricanes and floodings in San Francisco. About the relation between "Resilient City"AND"Porto Alegre", were not found articles researching this thematic.

5.2 The San Francisco Experience as Resilient City

According to Resilient San Francisco (2016), a strategy created to transform San Francisco, there are opportunities to ideas, people and culture to continue to build the city's resilience and improve the ways in which residents interact with the city.

We select goals used there that could be applied in Porto Alegre.

- Empower neighborhoods through improved connections: effective governmental stewards of resilient and cohesive neighborhoods based in trust, equity and partnership build stronger, more connected and more resilient neighborhoods.
- Data to empower residents: the SF Indicator Project is a system that measures the performance of a community, to support collaboration, planning and decision making for social and physical environments that meet the needs of the residents.
- Improve access to San Francisco Government: residents able to rely on city services for support, which will provide higher compliance, greater transparency and interaction.
- Develop a public digital service strategy: digital services that are accessible and easy to use, redefining its relationship with residents and visitors by becoming more responsive.
- Adapt transportation system: transportation system is a critical lifeline for families and workers. This goal focus on making San Francisco's transportation system stronger.
- Adapt to climate change: mitigation efforts, to the realities of a changing climate. Sea level rise threatens our waterfront, and intense storms and flooding are occurring with greater frequency, as are days of extreme heat.
- Develop a 50-year long-range transportation vision: develop future transportation studies and investment plans. The project seeks to ensure that all neighborhoods are more connected, addressing the impacts that displacement and lack of affordability have on quality of life. The improvements aimed at addressing congestion, getting ahead of fast growth and its impact on the city.

At all stages of the resilience-building process, the attention is on an integrated approach. It requires relationships between departments, government, residents, public sector, academia, public, private sectors and problems.

5.3 The trajectory of Porto Alegre

The selection of Porto Alegre Challenge 100 Resilient Cities represents the commitment of the city to build a better future. In 2014 was created the Strategy of Resilience of Porto Alegre, with the vision to make the city more resilient and a reference for other cities of Latin America. Its work was supported by actors from the public and private sectors, universities and community leaders, who organized themselves in working groups to define the areas of focus of the strategy, to increase knowledge through research on the challenges faced and to build initiatives that Strengthened the city's resilience (PORTO ALEGRE RESILIENTE, 2017).

We selected strategy points that fit what we observed in Sao Francisco.

- Dynamic and Innovative Ecosystem: to have a diversified economy that fosters creative, collaborative economies and new technologies.
- Culture of peace: democratize access to quality education, preventive safety, reduce social inequalities, and develop initiatives aimed at guaranteeing the fundamental rights of cultural, sexual, gender and ethnic identity.

- Risk prevention: a system, especially those of flood and slip, organized and effective, to protect families, prevent the eviction of persons and avoid accidents that impact the environment.
- Quality mobility: a system that meets the needs of residents with integrated alternative modes, controlled traffic, timely public transportation, universal accessibility, and undamaged sidewalks or irregularities.

The Porto Alegre Resilience Strategy represents an important step towards making the city capable of transforming and adapting to the different challenges it faces. Being resilient, therefore, is a new and necessary goal for Porto Alegre and for all other cities around the world.

6. FINAL CONSIDERATIONS

The applied research, to contribute to objectives stipulated on the beginning of this work could be presented:

a) To identify the main practices and politics that made San Francisco to be recognized as a world model of resilient city: this list was presented for identify what happened in the city to contribute its actual development and representativeness as resilient city;

b) To compare the reality (sociodemographic indices) of both cities: we could appreciate that both cities have more aspects in common than many people think, as its foundation date or its population and number of universities; and

c) to elaborate a list of recommended practices and politics that Porto Alegre could apply to become a more resilient city: it was built according to main politics and practices documented on San Francisco Resilient (2016), that is a report elaborated by the local Government, selecting what ones could be implemented in the context of Porto Alegre, what could inspire the city to become more resilient.

The main purpose, to suggest practices and politics to became Porto Alegre a more resilient city, was achieved with its limitations as comparing it to a city with a psychic distance, different income levels and cultural values.

The analysis of the urban development policies of San Francisco has shown that is indispensable for cities to involve their stakeholders, citizens, businesses, and NGOs, when making decisions. This empowerment and sharing of responsibilities between the public and private sectors enable the city to overcome diverse issues and enhance its citizen's wellbeing in the last decade.

A resilient city is an adaptive and learning process of transformation, with leaders and citizens, making the cities more innovative, responsive, inclusive and sustainable.

The experience of San Francisco suggests that investment in human capital, digital infrastructure, and other elements are critical and that local governments and business

councils can lead or facilitate this transformation. It is a constant practice and not a static state. It is a learning process, shaped by city leaders and citizens, creating cities that are more competitive, innovative, receptive, inclusive, resilient and sustainable.

7. REFERENCES

ACSELRAD, H.; LEROY, J. P. Novas premissas da sustentabilidade democrática. Revista Brasileira de Estudos Urbanos e Regionais, Rio de Janeiro, 1999.

BEZERRA, M. C. L.; BURSZTYN, M. Ciência e Tecnologia para o desenvolvimento sustentável. Brasília: Ministério do Meio Ambiente e dos Recursos Naturais Renováveis: Consórcio CDS/ UNB/ Abipti, 2000.

DATAPOA. POA Transporte. Available on: <<http://datapoa.com.br/dataset/poatransporte>>. Accessed: 2017, May 14th.

EPTC. Company of Circulation and Transportation of Porto Alegre. BikePoa. Available on: <http://www2.portoalegre.rs.gov.br/eptc/default.php?p_secao=228>. Accessed: 2017, May, 24th.

IBGE, Brazilian Institute of Geography and Statistic. 2010 Census. Available on: <<http://censo2010.ibge.gov.br/>>. Accessed: 2017, May 19th.

KEN, Knowledge Economy Network. Weekly Brief n. 20, 2012. Available on: <<https://www.knowledge-economy.net/uploads/documents/2012/briefs/KEN%20Brief,%20No.%2020,%20Year%202.pdf>>. Accessed: 2017, July 3rd.

MENEGAT, R.; ALMEIDA, G. 2004. Desenvolvimento Sustentável e Gestão Ambiental nas Cidades: estratégias a partir de Porto Alegre. Porto Alegre: Editora da UFRGS, 2004.

PORTO ALEGRE, City hall. Cidade: origem e história. Available on: <http://www2.portoalegre.rs.gov.br/portal_pmpa_cidade/?p_secao=3>. Accessed: 2017, Jun 25th.

PORTO ALEGRE RESILIENTE. Desafio Porto Alegre Resiliente. Available on: <http://www.portoalegreresiliente.org/downloads/estrategia_de_resilincia_de_porto_alegre.pdf> Accessed: 2017, Jul 6th.

SATTERTHWAITE, D. Como as cidades podem contribuir para o Desenvolvimento Sustentável. In: MENEGAT, R.; ALMEIDA, G. 2004. (org.). Desenvolvimento sustentável e gestão ambiental nas cidades: estratégias a partir de Porto Alegre. Porto Alegre: Editora da UFRGS, 2004.

SFGSA, City and Count of San Francisco. Resilient San Francisco: Stronger today, stronger tomorrow. Available on:

<<http://sfgsa.org/sites/default/files/Document/Resilient%20San%20Francisco.pdf>>. Accessed: 2017, May 2nd.

SIEMENS. US and Canada Green City Index: assessing the environmental performance of 27 major US and Canadian cities. 2011. Available on: <<https://www.siemens.com/press/pool/de/events/2011/corporate/2011-06-northamerican/northamerican-gci-report-e.pdf>>. Accessed: 2017, May 21st.

SMAM, Municipal Bureau of Enviroment of Porto Alegre. Projects and Actions. Available on: <http://www2.portoalegre.rs.gov.br/smam/default.php?p_secao=122>. Accessed: 2017, May 14th.

UNISDR, United Nations Office for Disaster Risk Reduction. San Francisco Welcomed as Role Model and First Major US City to Join UN Campaign. 2012 Available on: <<http://www.unisdr.org/archive/27286>>. Accessed: 2017, May 14th.

VARGAS, H. C. Mobilidade Urbana nas Grandes Cidades. URBS, São Paulo, n°. 47, ano XII, p 7-11, 2008.

WRI, World Resources Institute. 4 Keys to Unlock Innovative Urban Services for All. 2016. Available on: <<http://www.wri.org/blog/2016/02/4-keys-unlock-innovative-urban-services-all>>. Accessed: 2017, June 21st.

100 RESILIENT CITIES, Rockfeller Foundation. Our Cities. Available on: <http://www.100resilientcities.org/cities#/-/_/>. Accessed: 2017, May 16st.