Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 10, número 76, 2022

Smart cities: Disaster Resilience Outlook in the city Juiz de Fora / MG

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Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 10, número 76, 2022

ABSTRACT

Disasters are phenomena such as: flooding, landslides, droughts, hurricanes, earthquakes, among others. Risk and disaster management constitutes a social process that aims at predicting reduction and controlling permanently the main factors that originate nature disasters in society. According to the UN (2021), in the last two decades, the flooding situation was responsible for more than 40% of the disasters, impacting negatively 1.65 billion inhabitants, followed by big storms representing 28%, earthquake incidence of 8% and 6% of extreme temperature consequences. This paper utilizes as methodology exploratory and qualitative research, followed by review about other academic papers on the subject, in order to map the disaster resilience outlook in the city Juiz de Fora/MG. Urbanization is a world challenge, in 30 years two thirds of the world population will be living in urban areas, so it is imperative that cities are adapted to be resilient, in order to preserve life and the environment.

KEYWORDS: Resilient Cities. Sustainable Development. Risk and Disaster Reduction. Juiz de Fora.

1. INTRODUCTION

It is important and essential that more and more cities become smart, integrating all resources, technologies, innovations, innovative programs of public administration, adequate policies to face disasters, adversities, becoming with adequate sustainability models promoting safety, well-being and quality of life for everyone.

Disasters are severe natural phenomena such as: floods, landslides, droughts, hurricanes, among others, strongly influenced by regional characteristics, such as rock, soil, topography, vegetation and also meteorological conditions. With the occurrence of these phenomena in places of human habitation, it results in several material and human damages, in addition to enormous socio-economic losses. Adverse events mean hostile, contrary situations that bring unhappiness (KOBIYAMA et al., 2006).

Smart Cities are a set of systems and people that interact and use energy, materials, various services and financing to catalyze optimal economic development and a better quality of life for all (ALBINO et al., 2015).

Humanitarian Logistics is a complex process with high instability, as it encompasses serious operational challenges such as: unknowns, time, logistical improvement, means of communication and financing, equipment and information technology, as well as interference (OVERSTREET et al. al., 2011).

According to the United Nations -UN (2020), Brazil appears among the 15 countries on the globe with the highest population index exposed to the risk of river flooding. Approximately about 70 disasters affected the Brazilian population between 2000 and 2019, taking proportional terms in consideration, Guyana is the country with the highest proportion of population affected by disasters in Latin America and the Caribbean.

To carry out the research, national and international papers and researches, scientific articles, national and international political bodies were used to map the importance of cities to become resilient in the face of disasters, conceptualization of smart cities, world examples of resilient cities and a special clipping on the outlook resilience to disasters in the city of Juiz de Fora/MG.

Data from the United Nations - UN (2021), obtained through the report of the UN Office on Disaster Risk Reduction, observed a considerable increase in climate disasters, 7,348 disasters occurred in the world in the last two decades, with 1.23 million people killed, approximately 60,000 people a year. Also noteworthy is the reach of more than 4 billion people who have been affected by disasters. There is a loss of US$ 2.97 trillion for the world economy and also a four times higher mortality in disfavored nations when related to the holders of wealth (UN, 2021).

Furthermore, according to the UN (2021), in the last two decades the situation of floods was responsible for more than 40% of disasters, negatively impacting 1.65 billion inhabitants, followed by large storms representing 28%, earthquake incidence 8 % and occurrences of extreme temperatures 6%.

Effectively, the importance of a better preparation of nations is necessary, better adherence to solve these world problems, urgent actions for the management of risk factors such as extreme poverty, air pollution, urbanization without control, damage to biodiversity, so that preserve life and guarantee survival for all and the correct preservation of the natural environment.

The UN (2021) also emphasizes the effects that the Covid-19 pandemic has had on disaster risk management, due to the lack of planning by nations and the absence of political leadership.

A considerable increase in temperature of 3.2º C or more is perceived every day, which can only be controlled if industrialized countries achieve a reduction in greenhouse gas emissions by at least 7.2% each year in the decade next (UN, 2021).

2. ESSENCIALS OF RESILIENCE AND SUSTAINABILITY FOR RISK AND DISASTER MANAGEMENT

Humanitarian logistics encompasses processes and systems involved in mobilizing individuals, existing resources and knowledge to assist communities exposed and affected by natural disasters with highly complex emergencies. It aims at a prompt response, as well as to serve the largest number of people to avoid absence and waste, planning donations and achieving performance within the planned budget (NEVES, 2013, p.165).

The concept of Risk Societies was defined by Ulrich Beck, where the most important risks that occurred in the 19th century were listed, such as the incidence of nuclear energy and pesticides, which were not measured until now. The unification of science and industry gave rise to the risk society, however the new risks promote alliances and different ways of executing the policy. In view of these concepts, logistics are used in order to find dense solutions for risks that were otherwise unresolved. (GUIVANT, 2016).

Samed and Gonçalves (2017) observe that natural phenomena cause destruction of geographic areas, affecting the entire community of the locality, which in most cases, affect the same region, also with an identical degree of intensity. Uffizi (2014) reports that the increase in urban centers of people is rising over the years, with these places being more prone to the occurrence of disasters on a larger scale. The incidence of these disasters becomes a Humanitarian Logistics issue if people are affected. On the contrary, an avalanche in a specific

region where it does not reach people, does not consider Humanitarian Logistics. Considering the terrorist attack where the variation of conditions occurs, as it is not possible to predict where the attacks occur and what their exact intensity is, but Humanitarian Logistics is necessary.

Samed and Gonçalves (2017) report that the last two decades have become essential for the deepening of the concept of Humanitarian Logistics, and the incidence of large-scale disasters has made this topic a topic of study, including some of the most major world disasters listed below:

- Terrorist attack on the Twin Towers, in New York, 2001;
- Tsunamis in the Indian Ocean, 2004;
- Earthquake in Haiti, 2010;
- Ebola Virus in Africa, 2014;
- Syria refugee crisis and terrorist attacks in Europe, 2015-2017;

In Brazil, disasters with high relevance also occurred, such as:

- Oil spill in Guanabara Bay, 2000;
- Landslides and floods in regions of Vale do Itajaí in Santa Catarina, 2008 and 2011;
- Floods in the northeast, 2010;
- Intense rains, floods and landslides in the mountainous region of Rio de Janeiro, 2010 and 2011;
- Dam failure at the Samarco company in Minas Gerais, 2015.

It is worth mentioning that any disaster requires the implementation of a well-defined tactical and operational strategy that must begin prior to the occurrence of the same. Decision making encompasses the preparation and response phases (SAMED; GONÇALVES, 2017).

According to Coelho (2018), in the preparation phase, the necessary supplies are defined, power and coordination are centralized. It can be civil defense, members of the Mutual Assistance Plan - PAM. Samed and Gonçalves (2017) emphasize that in the response phase, knowledge of the means of transportation, distribution, collection, volunteers, and correct sharing of all information is essential for the coordination of response actions to occur successfully.

2.1 RISK AND DISASTER MANAGEMENT

According to Gonçalves et al. (2016), risk and disaster management is a social process that aims at predicting the reduction and permanent control of the main factors that cause natural disasters in society, combined with human growth, the economy, the environment and building sustainable territories.

In this context Gonçalves et al. (2016), emphasizes that for the effectiveness of risk management it is essential to implement these processes:

- Identification of the nature, extent, degree of intensity and extent of the threat.

- Determining the existence and level of vulnerability present.
- Identification of measures and free resources.
- Construction of possible risk scenarios.
- Determination of acceptable degree of risk, and weighting of expenses and benefits.
- Establishment of priorities considering time and displacement of resources.
- Design efficient management systems for proper implementation and control.

It is also worth noting, according to Vallejo et al. (2014), the definition of disaster control segmentations:

- Mitigation: analysis of primary actions to reduce possible disasters and minimize impacts after their occurrence.
- Preparation: planning activities when disasters are imminent.
- Response: use of emergency resources to preserve life and infrastructure, environment and social structure, economy and politics of the established region.
- Recovery: application of adherent measures so that the affected area returns to its normal state.

2.1.1 PROTECTION AND CIVIL DEFENSE

The National Policy for Civil Defense and Protection - PNPDEC, is a doctrine of protection and civil defense in Brazil that must be integrated with policies for territorial order, urban development, health, environment, climate change, coordination of water resources, geology, infrastructure, education, science and technology in order to promote sustainable growth, providing essential indications of the main policies that interact with risk management. The PNPDEC also determines that there is systemic management for risk management within the prevention, mitigation, preparation, response and recovery actions (SEDEC, 2017).

Protection and Civil Defense is organized through the National Civil Defense and Protection System - SINPDEC. Law 12,608/12 defines the composition of SINPDEC with different public political organizations that have responsibilities for its management, with a view to the possible participation of society, defined by Article 11, including a consultative political organization, central political organization, state and municipal regional political organization of protection and civil defense, and sectorial political organizations that are part of the three spheres of government, in addition to voluntary community organizations or entities with civil protection and defense actions (Law 12,608, 2012).

2.2 IMPORTANT CONCEPTS OF PROTECTION AND CIVIL DEFENSE

The Brazilian Normative Instruction No. 2 of December 20, 2016 (IN/MI No. 2/2016), brings important concepts to the area of protection and civil defense that will be listed below.

Response: constitutes a set of emergency measures, developed during or after the disaster, aiming at providing relief and assistance to the population that was impacted and the return of main services (IIN/MI nº 2/2016).

- Disaster: encompasses the results of adverse occurrences of nature, technological or anthropic, around a vulnerable location exposed to threat causing human damage, material damage or environmental damage, with negative impacts for the economy and society. Disasters are classified according to their intensity (IN/MI nº 2/2016).
- Emergency Situation: scenario with abnormality, caused by disasters, causing damage (IN/MI nº 2/2016).
- State of Public Calamity: abnormal situation, caused by a disaster that causes damage and losses, implying a substantial commitment of the response capacity of the public power of the federation that was impacted (IN/MI nº 2/2016).
- Damage: set of results of human, material or environmental losses inflicted on people, locations, institutions, facilities and ecosystems as a result of a disaster (IN/MI nº 2/2016).
- Damage: economic, social and patrimonial losses of a specific asset, with disaster circumstances (IN/MI nº 2/2016).
- Resources: encompasses material, human, institution and economic assets that are used in the event of disasters in order to meet the need for the normal state to be restored (IN/MI nº 2/2016).

2.2.1 DISASTER RESPONSE ACTIONS

Disaster response actions are a combination of aid actions, assistance to those affected, and actions to restore primary services, which are determined by Federal Decree No. 7,257, of August 4, 2010, described below.

- Aid Actions: constitutes actions with immediate response to disasters with the aim of helping the affected population, including search and rescue, first aid, pre-hospital care and medical care and emergency surgeries (Federal Decree nº 7.257, of August 4, 2010).
- Victim Assistance Actions: immediate actions aimed at guaranteeing minimum conditions and citizenship to those affected, providing drinking water, provisioning and means of preparing food, supplies of materials needed for shelter, clothing, hygiene and cleaning, establishment of laundries, bathrooms, logistical assistance from teams committed to the development of actions, integrative health care and adequate handling of victims (Federal Decree No. 7,257, of August 4, 2010).
- Actions for the Restoration of Essential Services: actions of an emergency nature designed to restore safe housing conditions in the place affected by the disaster, including dismantling of buildings and works of art that were compromised, supply and distribution of electricity, drinking water, sanitary sewage, urban cleaning, rainwater drainage, public transport, traffic conditions, communication systems and debris removal (Federal Decree No. 7,257, of August 4, 2010).

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2.3 RISK AND DISASTER REDUCTION

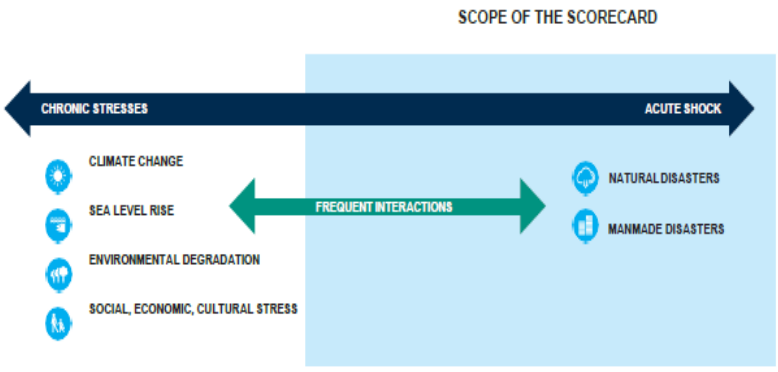
The United Nations Office for Disaster Risk Reduction - UNDRR (2017), launched a tool with the presence of ten indicators so that governments can monitor and review the present challenges and progress towards implementing the Sendai Framework for Action to Reduce Disaster Risk from 2015 to 2030 and monitoring resilience to disasters based on ten UNDRR essencials to build more and more Resilient Cities.

2.3.1 RESILIENCE TO CATASTROPHES´ ASSESSMENT INDICATORS

According to the Sendai Framework for Action, resilience is the capacity of a given system or location or population that is exposed to resist hazards, absorption, accommodation, adaptation, transformation, recovery from the consequences of a given risk, with efficient action, with ability to preserve and restore essential structures for life and functions that are essential for risk management (UNDRR, 2017).

It is increasingly necessary for cities to become resilient so that they can resist and recover from natural or human-caused disasters, such as earthquakes, hurricanes, fires, floods, chemical spills. The locality self-assessment tool integrates the ability to understand hazards, mitigate them and efficiently respond to catastrophic events so that current losses and subsequent losses such as destruction and damage to properties, infrastructure, economy, environment are minimized. We still need professionals who consider the risks and shocks that can impact and acute severities, which can harm the response and re-adaptation phase of the locality as Image 1 below that represents the self-assessment tool for stress and shocks that a city is conducive to (UNDRR, 2017).

Image 1: The Scope of the Disaster Resilience Scorecard for Cities



Source: (UNDRR, 2017).

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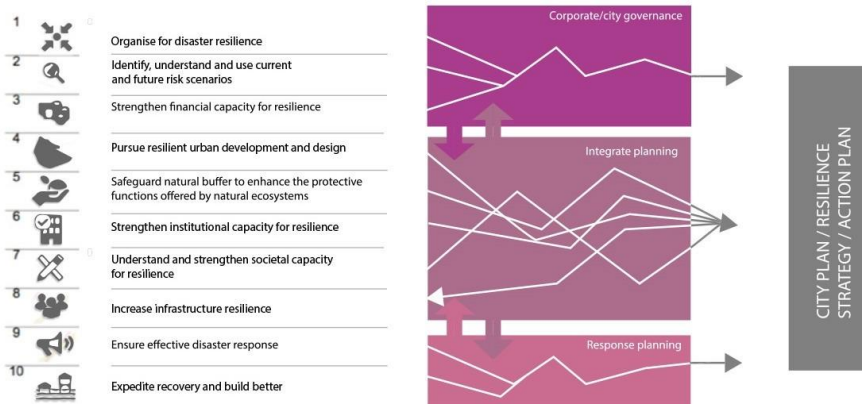
2.3.2 TEN ESSENCIALS FOR BUILDING RESILIENT CITIES

The Self-Assessment Tool is structured around Ten Essencials for Building Resilient Cities (Image 2 below), first created as part of the Hyogo Framework in 2005 and later enhanced to support and implement the Sendai Framework for Risk Reduction Action disaster in the period from 2015 to 2030 (UNDRR, 2017).

Image 2: Ten Essencials for Building Resilient Cities



Source: (UNDRR, 2017).

According to the UN, the population residing in urban areas by the year 2050 will correspond to 66% of the world's population and the estimate is that by 2030, there will be 41 megacities with a population of over 10 million inhabitants. Below Image 3 represents the UN Sustainable Development Goals, highlighting Goal 11 – Sustainable Cities and Communities – Challenges and Opportunities (Make cities and human settlements inclusive, safe, resilient and sustainable), which includes urban planning, mobility, solid waste management, sanitation and the growth of resilience in these areas encompass the goals of this objective described below.

Image 3: UN Sustainable Development Goals

Source: (UN, 2021)

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3. METHODOLOGICAL ASPECTS

The research will be exploratory and qualitative, starting with a systematic review of papers and researches on the topic, searching for articles, books and dissertations covering humanitarian logistics, resilient cities, disasters and adverse events, and approaching case studies in smart cities specifically in Brazil, in addition to agencies public, decree, normative instructions and essential laws for the theme of the dissertation.

Subsequently, the weighting of world examples of smart cities and importance for adherence to the UN Sustainable Development Goals will be carried out. As a specific cut, adverse situations that occurred in the city of Juiz de Fora/MG and the outlook of resilience and sustainability will be listed according to the objectives required by the UN to be a resilient city to adverse events and how the city has prepared itself for these changes.

According to Mattos (2015), the Literature Review constitutes the process of searching, analyzing the description of a subject of knowledge with the objective of reaching coherent answers to a specific question. The idea of reviewing encompasses all material researched on the subject such as: books, journal articles, newspaper articles, historical records, government reports, theses and dissertations, among others.

4. RESULTS AND DISCUSSIONS

The Ten Essencials for Building Resilient Cities provide a broad range of problems that cities need to solve to be resilient to disasters. Essencials 1, 2 and 3 cover governance and financial capacity. Essencials 4, 5, 6, 7 and 8 encompass several dimensions of disaster planning and preparedness. Essencials 9 and 10 cover disaster response and post-disaster recovery.

According to the UNDRR (2021), 4360 cities are preparing to become resilient, as shown in Image 4 below, there is an increasing need for greater adherence to consolidate resilience and constant benefits for risk reduction, pre-disaster planning, during the occurrence and post-disaster.

Image 4: Participating Local Government

Source: (UNDRR, 2021).

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4.1 RESILIENCE IN THE CITY OF JUIZ DE FORA /MG

The city of Juiz de Fora in the Brazilian state Minas Gerais is one of the cities in Brazil with the best quality of life indicators. It has approximately 500 thousand inhabitants, Gross Domestic Product - GDP per capita of R$ 6.2 thousands, in addition to being one of the cities with high life expectancies in Brazil (PJF, 2021). Juiz de Fora has a territory of 1,435,749 km². (data from 2020), population of 573,285 individuals (data from 2020), population density of 359.59 inhab/km² (data from 2010), schooling from 6 to 14 years of 98.3% (data from 2010), IDHM Index of Municipal Human Development - IDHM of 0.778 (2010 data), infant mortality of 12.23 deaths per thousand live births (2019 data), Complete Revenues of 1,578,267.99 BRL (×1000) (2017 data), Committed expenses of BRL 1,571,853.68 (×1000) (2017 data), Brazilian Institute of Geography and Statistics (IBGE, 2021).

According to the Juiz de Fora City Hall - PJF (2021), Juiz de Fora is enrolled in the UN Resilient Cities program, and was awarded the Certificate of Commitment to Disaster Resilience through the United Nations Office for Disaster Risk Reduction (UNDRR) in the year 2020, which aims to solidify adequate conditions to face emergency situations arising from disasters. Thus, Juiz de Fora/MG is committed to adopting relevant and essential measures for the improvement of risk management in the structural, institutional, plan and risk management and social organization in order to become capable of constant adaptation in response to the present challenges of a city in progress.

According to (PJF, 2021), the Civil Defense in Juiz de Fora carried out a public consultation to assess the level of resilience. It applied a questionnaire containing 47 questions about numerous aspects related to the preparation, action and response to catastrophic situations, where it was possible to assemble a profile indicating the current situation of the municipality, its responsibilities and the necessary improvement to reach the apex to face moments of crisis. . The survey reached 2,000 responses from 238 people and the results were delivered to the Executive Branch and presented to the City Council by members of the Federal University of Juiz de Fora (UFJF) and the Civil Defense through an online audience. As a second preparation for qualifying Juiz de Fora as a Resilient City, a more Resilient Juiz de Fora workshop was held in November 2020 for self-assessment of resilience in the city according to UFJF (2021), in a previous period the tool had already been applied to the departments that were appointed by Decree 14.067/20, which integrates a committee of structures, preventive measures and disaster aid in the municipality. The standardized questionnaire was carried out by the United Nations Office for Disaster Risk Reduction (UNDRR).

Each of the 47 questions had a grade rating, on a scale from 0 to 3, where 0 indicates the total absence of conditions in the question addressed, and 3 total condition. The consolidated assessment indicates index 2 of compliance with resilient measures. In a total of 30 from the 47 questions, representing 63.8% of them, an assessment was found to be higher than 2. The goal is to strengthen preventive measures and emergency assistance, benefiting resources to improve protection and civil defense actions. The report will be directed to the UNDRR, for the growth of the city and the creation of a Municipal Resilience Plan (PJF, 2021).

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4.2 CONSULTING SUSTAINABLE CITIES

The UN - Habitat and Colab, developed in 2020 the second edition of a survey that identified the opinion of more than 10,000 Brazilians about the state of sustainability in their locality. The Sustainable Cities Consultation took place from 10/2019 to 02/2020, through a digital form made available to the Brazilian population. At the same time, it is important for cities to have the capacity to deal with crises such as the Covid-19 pandemic, which requires awareness of hygiene and social isolation and the importance of having adequate sanitation (UN-HABITAT, 2021).

During the research process, the citizen can choose only one answer for each question, most of them used an associated value from 1 to 5, where the lower values represent a negative perception and the higher values represent a positive perception. In order to obtain the perception value of each axis for a citizen, the arithmetic average of the values related to the answers for the totality of questions in the axis was calculated. To obtain the value of the perception of a certain axis for a locality, or for Brazil, the arithmetic average of the values of that axis was calculated for the totality of people in the city or all people in Brazil. The second edition had 10,885 people from all states and 785 different municipalities, the Ambassadors Program brought together 933 people who gave rise to 4163 participants, corresponding to 38% of all respondents (UN-HABITAT, 2021).

According to IBGE (2018), Brazil has an estimated population of 208,494,900 people. The survey had 10,885 participants, where the States of São Paulo represented 28.86%, Rio de Janeiro 17.15% and Minas Gerais 12.80%, these being the largest contributors to the survey, followed by Piauí with 9.73%, Rio Grande do Sul 8.10% , Pernambuco 7.70%, Bahia 4.93%, Paraná 4.05%, Alagoas 3.56% and Amazonas 3.11%. The most contributing cities to the survey were São Paulo, representing 16.65%, Teresina (PI) 15.96%, Niterói (RJ) 14.74%, Juiz de Fora (MG) 12.12%, Santo André (SP) 11.63%, Recife (PE) 7.27 %, Rio de Janeiro (RJ) 5.96%, Porto Alegre (RS) 5.66%, Manaus (AM) 5.25% and Maceió (AL) 4.76%. Juiz de Fora occupies the 4th place of greatest contribution among cities for research (UN-HABITAT, 2021).

The survey contained 30 questions, where positive points were given for urban life and negative points for accessibility to transport and adaptability to climate change (UN-HABITAT, 2021).

4.2.1 JUIZ DE FORA/MG

Juiz de Fora (MG) has an estimated population of 564,310 inhabitants according to IBGE (2018), in 2019 it was awarded 5th place in the Urbanism axis of the Connected Smart Cities Ranking, and 5th place in the Governance axis. In the first and second editions of the Sustainable Cities Consultation, with 659 participants in the survey, sustainable and resilient constructions stood out more, with 41.01% of participants saying they agree or strongly agree that in the last two years there has been progress in building constructions with sustainability and resilience using local materials, 25.23% strongly disagreed or disagreed and 33.64% neither agreed nor

disagreed, demonstrating that the population does not have the necessary knowledge on this topic (UN-HABITAT, 2021).

The Adaptability to climate change axis, on the other hand, was the least highlighted, where 14.7% of respondents declared knowledge of policies on climate change and resilience to disasters, this percentage is lower than in Brazil, where 22.1% of people know these policies. Most respondents believe in the improvement of these policies in the last two years, with 47.35% agreeing, 6.33% strongly agreeing and 15.71% strongly disagreeing or disagreeing. Thus, the axis of adaptation to climate change had a worse evaluation due to people's lack of knowledge about these policies. However, people who know this axis made a good evaluation, portraying to the City Hall the importance of having adequate communication on actions related to the theme to expand public policies (UN-HABITAT, 2021).

Decree nº 14.067/2020 reports on the Resilient Juiz de Fora Committee - CJFR, emphasizing that resilient cities have the capacity to resist threats, with the aim of increasing learning from disasters that have already occurred and establishing future protection measures to reduce the risk of disaster, reporting that, in Juiz de Fora, there is already adherence to the global campaign Building Resilient Cities of the United Nations Office for Disaster Risk Reduction (UNDRR), perceiving the need for a systemic approach to prevention, mitigation, preparedness, response and recovery actions, referring to risks and disasters in the city of Juiz de Fora; it also ponders the determinations of the third World Conference of the United Nations - UN on Disaster Risk Reduction (WCDRR), called Sendai Framework, which sets goals to be achieved from 2015 to 2020, emphasizing the importance of increasing the degree of awareness and commitment around the practices established in the Global Platform for Disaster Risk Reduction. The functioning of the Resilient Juiz de Fora Committee - CJFR will be directed by the integrated actions of the political organizations belonging to the Municipal Civil Defense and Protection System - SIMPDEC, as well as members of the Federal University of Juiz de Fora and the Military Fire Brigade of Minas Gerais and the Juiz de Fora City Hall (Decree No. 14,067, of August 27, 2020).

5. FINAL CONSIDERATIONS

The growing continuity of human activities, changes in the environment and climatic conditions, unregulated exploitation of natural resources that interacts with a greater number of exposed people, both in social and economic terms, with vulnerability in fragile scenarios, trigger disasters with great human, environmental and material damage. This context, which has a complex reality of threats and states of vulnerability with consequent risks and exposure, is what justifies the plan and preparation for disaster management, even though prevention is paramount. Thus, for the disaster response to occur effectively, protection and civil defense agencies, including municipal ones, need to be structured and organized, working together with the other agencies that make up the National Civil Defense and Protection System - SINPDEC (SEDEC). , 2017).

From data collected by the Center for Research on the Epidemiology of Disasters - CRED, it was noticed that in the period between 2005 and 2013, an average of 116 countries

were impacted per year, causing thousands of victims and homeless people. The development and impact caused by disasters are also correlated, with more victims affected in countries whose economic development is lower. Low-income countries represent 43 deaths per million inhabitants, when compared to high-income countries, the mortality rate is 9 deaths per million people.

The World Campaign Making Cities Resilient was launched in 2010 by the UNDRR out of concern for the growing number of individuals impacted by disasters who commonly have resilient planning based on the Ten Essencials for Building Disaster Resilient Cities.

According to the City Hall in Juiz de Fora -PJF (2020), the city of Juiz de Fora signed up for the Resilient Cities program and received the Certificate of Commitment to Disaster Resilience. This document is conferred by the United Nations Office for Disaster Risk Reduction (UNDRR), demonstrating that the city is concerned with the new reality of the need to adapt to become a resilient city. There is currently a global crisis, the Covid-19 pandemic, whereas, in a few months the new coronavirus infected 20,590,068 people in Brazil, and 212,540,697 people in the world, causing 575,202 deaths in Brazil and 4,441,321 deaths worldwide, according to DASA data until August 2021. This reality clearly portrays the increasing existence of cities with resilience to urban humanitarian crises, in order to be able to provide an adequate response capacity for all, preserving life and promoting scenarios of resilience and recovery. The pandemic needs a response capacity to reduce the transmission of the coronavirus, requiring cities to be resilient to crises.

Brazil is a country where approximately 85% of the population lives in urban areas, when compared to the world average of 50%, it is a country with present urbanization. It is increasingly necessary to make it sustainable, with the participation of people, so that increasingly smart cities are built.

Urbanization is a global challenge, in 30 years two thirds of the world's population will live in urban areas. Uncontrolled urban growth, lack of planning and inequality constitute global challenges, despite urbanization being a boost to development, as cities contribute to 80% of the world's GDP and can be an improvement in life for the unfavored population.

Urbanization is on the rise for the next decade, estimated to increase from 56.2% currently to 60.4% by 2030, 96% of growth will take place in less developed regions of East Asia, South Asia and Africa, with 3 countries (India, China and Nigeria) representing 35% growth of the total world urban population from 2018 to 2050 (UN HABITAT, 2021).

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