

ENVIRONMENTAL JUSTICE AND URBAN PLANNING: BUILDING RESILIENCE IN VULNERABLE COMMUNITIES

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ABSTRACT

Vulnerable communities are defined as the most disadvantaged populations. In Brazil, these include the Indigenous Peoples, Afro-descendants, and the destitute. In the context of the adverse effects caused by climate change, these communities are usually the first to suffer and the ones who experience the most hardship, as they have less capacity for adaptation. Urban sprawl without adequate planning has made cities increasingly discontinuous, contributing to the exponential growth of peripheral areas, highlighting the differences between social classes and subjecting the less fortunate to a greater burden of toxic stressors, discrimination, racism and political isolation. In this context, this study poses the following question: How can environmental justice work through participatory community-based urban planning? The purpose of this study was to understand how to build resilience in these communities through the concept of environmental justice. This article was developed through bibliographical research and concluded that there is no ready solution that solves the urban inequalities that exist in the cities, but that the hope materializes through participatory urban planning, based on the precepts of environmental justice and development sustainable development. For this achievement, it is necessary to seek team planning, capable of uniting residents of vulnerable communities to local governments, in partnership with the scientific community, creating resilient neighborhoods that will not suffer from gentrification.

Keywords: Environmental Justice. Urban planning. Vulnerable Communities. Resilience.

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1 INTRODUCTION

Climate change consequences have become evident around the world. Climate events have become increasingly more severe and, according to Shepard and Corbin-Mark (2009), are considered the most significant social and political challenge of the 21st century because human-induced CO₂ emissions have impacted, and will continue to do so, the natural systems of the Earth, causing global warming and rising sea levels which shall pose serious risks to future generations.

Moreover, according to Shepard and Corbin-Mark (2009), one aggravating factor is that vulnerable communities, including those in wealthy nations, are the first to be impacted by climate change and also the most affected groups. Generally, the most affected communities in Brazil are the Afro-descendants, the Indigenous Peoples and the low-income populations, who are socially disadvantaged. They are disproportionately impacted by poor environmental quality and are less capable of adapting. These people will be the first to experience extreme heat waves, respiratory disease, vector-borne infectious diseases, food insecurity, and natural disasters..

This has been especially observed in the Western world, where these vulnerable communities often suffer some kind of prejudice, such as ethnic, religious, racial or other prejudices. Hence, this constitutes the existence of a so-called Environmental Racism against these communities, and which must be fought. Selene Herlunano (2008, p. 16) defined Environmental Racism as “[...] related to the environmental and social injustice that disproportionately affects vulnerable ethnicities.”

The term was coined in the 1980s in the United States (USA) in the aftermath of certain events that affected vulnerable communities, such as when a Black community in Warren County, North Carolina found out that a dump for PCB (polychlorinated biphenyl) would be installed in their community. African-Americans led national protests against what they then-labeled as Environmental Racism. After this event, African-American activists pressured Congress and eventually the US General Accounting Office conducted a study that found that the spatial distribution of dangerous chemical dumps and extremely polluting industrial waste was not random, but rather was in line with the territorial distribution of poor ethnicities in the USA (Herculano, 2008).

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This discrimination highlights the fact the wealthiest “push” this environmental pollution to the periphery, causing environmental risks to be borne most intensively by the poorest and most vulnerable communities (Herculano, 2002).

Brazilian urban spaces have undergone enormous population and territorial growth in the past decades. In this processes, these cities have become increasingly discontinuous, contributing to the exponential growth of peripheral areas. This highlights the difference between social classes, and further fragments and segregates urban space, where certain areas are visibly occupied by poorer populations who cannot afford housing in the most central districts of their city. Afro-descendants are overrepresented in these disadvantaged areas, which is a symptom of historical structural racism as described by Silvio Almeida (2019). Racism is manifested through racial segregation, that is to say, space is divided racially in certain neighborhoods, ghettos, peripheries, etc.

Almeida (2019, p. 15) argues that: “[...] racism always is structural, that is to say, it is an element that integrates the economic and political organization of a society.” It is a “normal” manifestation of society, which provides “[...] the meaning, logic and technology to reproduce the inequality and violence that shape contemporary social life.” Hence, the manifestations of racism, be they institutional or in interpersonal relations, are manifestations of something deeper, developed and nurtured within “[...] the political and economical heart of society.” Thus, structural racism explains the existence of environmental racism.

For this reason, the 1st and 2nd Brazilian Seminars against Environmental Racism were held in 2005 and 2009. These events promoted debates on the different kinds of violence against vulnerable communities, especially in relation to development and progress, which should be based on sustainable and socially-egalitarian projects, but which actually occur in a socially- and environmentally-unfair manner.

In this context, Jason Corburn (2017a) states that researchers and governmental agencies throughout the world have increasingly recognized the need to document cumulative exposure to pollution and the increased environmental risk due to climate change that poor urbanites and Afro-descendants experience. These “toxic stressors” may exacerbate the health impacts of exposure to pollution and they include social and economic factors such as discrimination, racism, isolation, and political exclusion.

Corburn also argues that the fight against this injustice involves structures and research methods that are related to urban environmental justice, including participatory

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community research, the measurement of stressor accumulation, and the mapping of assets and liabilities in a community.

It should be highlighted that the human environment should be understood as an interaction between ecology (biological environment), physics (natural and constructed), social, politics, aesthetics, and economic environments. The health impacts of built-up environments makes an urban planning that creates a healthy environment necessary. Moreover, transportation and poor use of land have been explicitly linked to poor public health outcomes, such as increases in obesity, asthma, and poor mental health. Therefore, urban planning and public health need to be reconnected (Corburn, 2004).

In this scenario, this paper raises the following research question: How can environmental justice work through participatory community-based urban planning?

The main goal of this paper is to understand how to build resilience in vulnerable communities by using the urban environmental justice concept. The specific objectives of this study are to explain the concept of environmental justice; to share relevant information about the right to housing; to raise awareness about vulnerable communities and their hardships; to highlight examples and parameters for the development of a participative urban planning aided by environmental justice.

The study used the literature review methodology, using data and information in books and papers about the topic. The research was conducted between May and July 2019, in the following online databases: PubMed, Biblioteca Virtual em Saúde (BVS) and Google Scholar. The following key words were used: environmental justice; urban planning; vulnerable communities; resilience. Papers and books that were fully available online in Portuguese or English and that could provide relevant information to this research were included.

2 ENVIRONMENTAL JUSTICE, URBAN PLANNING, AND BUILDING RESILIENCE

2.1 Environmental Justice

The debate about environmental justice started in the USA in the 1960s. Its main objective was ensuring that African-Americans and minorities in peripheral areas had the

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right to clean air, to be less exposed to toxic waste, and were guaranteed access to good-quality health-care (Alves & Mariano, 2017).

Selene Herculano defines Environmental Justice as:

[...] the set of principles that ensure that no group of people, be it ethnic, racial, or class, bears a disproportionate share of the negative consequences of economic activity, of federal, state and local policies and programs, as well as the results of the lack of such policies. In addition, “Environmental Injustice” is the mechanism through which unequal societies place a higher share of the environmental damage resulting from development on the working class, the poor, the racial minorities, the disadvantaged, and the most vulnerable (Herculano, 2008, p.3).

For example, traffic pollution concentrations are frequently higher next to highways and main roads and poor communities often develop around such places. The tailpipe gases and particles emissions mix of fresh motorized vehicles is different from other atmospheric pollutants, which are more uniformly distributed in great metropolitan areas. In this case, the main pollutants include ultrathin particles (< 0.1 micron diameter), black carbon, PM10 (particles with less than 10 microns diameter), nitrogen oxides, carbon monoxide, and volatile organic compounds. Thus, people who live or spend time near busy roads are more exposed to these pollutants. Research has consistently found that living closer to heavy traffic roads is correlated with higher rates of asthma in childhood and reduced lung function, worse cardiovascular health, higher mortality, and autism (Brugge et al., 2015).

The issue of environmental injustice is particularly worrisome in urban areas, where the poor and the Afro-descendants are frequently segregated into neighborhoods where adverse environmental conditions are made worse by political, social and economic deprivation (Corburn, 2017a).

2.2 Segregation, the right to housing, and dignity

The Brazilian Federal Constitution of 1988 defines the right to housing as one of the fundamental social rights in article 6. In article 5, it also establishes that “all shall be equal to the law, without any kind of distinction” (Brazil, 1988).

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A brief analysis of fundamental rights is required here. These are considered the most important constitutional protection of citizens' human rights, and are constitutionally protected, that is to say, they have already been implemented in a Federal Constitution (Sarlet, 2012). It should also be noted that the cornerstone of human rights and fundamental rights is human dignity, which may be defined as an innate quality of all people (Bernardo, 2014).

Ingo Wolfgang Sarlet (2009, p.37) defined human dignity as:

The intrinsic and distinctive quality recognized in every human being which makes them worthy of the same respect and consideration from the state and their community, which is the cornerstone of a set of fundamental rights and responsibilities that protect the person against any degrading and inhuman act as well as guarantees them minimal living conditions for a healthy life. It also offers and promotes active and responsible participation in defining the fate of one own's life as well as the community life with other human beings.

Despite human dignity forming the cornerstone of fundamental rights, and the right to housing being a fundamental right and everyone being equal under the law, there is great social and racial segregation in cities. The best-located neighborhoods have better infrastructure, are the target of land speculation, and are inhabited by middle- and upper-class whites. The poor (which include many Afro-descendants) are forced to live in distant peripheries which are ignored by the government, lacking their Constitutional fundamental rights.

Ingo Wolfgang Sarlet (2003) explains that government and private interests often disrespect or collide with social progress, damaging democracy and weakening the state's role in providing and guaranteeing fundamental rights to many of its citizens. In this case, the very idea of citizenship as the right to have rights is under great threat. Social exclusion indexes have been rising in great part due to the negative effects of economic globalization, and constitute a risk factor to democracy.

According to Madeiros, Grigio e Pessoa (2018) urban environmental issues which lead to social segregation are caused by the fast, intense, and often chaotic urbanization processes that constituted (and still constitute) Brazilian cities. This urbanization model is typical of contemporary societies in most developing nations and has a series of negative consequences. For instance, the aforementioned authors claim that most existing cities have serious urban infrastructure issues, differentiating, segmenting and

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vulnerabilizing their spaces. Among the urban infrastructures, one may cite the absence of basic sanitation, the inadequate disposal of solid waste, and housing in improper spaces. These are a few of the many examples of issues that poor urban planning causes for certain populations, especially lower income ones.

To understand how the Brazilian urban space was built and occupied, it is necessary to return to the history of Brazilian occupation, which shows that urban space was created in an unequal fashion. Urbanization in Brazil began in the 18th century and, due to changes in its structural process, reached its current urbanization model in the 20th century. During the colonial era, there was very little development in urbanization: it grew just 3% from 1890 to 1920. But from 1920 to 1940, urbanization rates in Brazil tripled and reached 31.24% (Santos, 1993).

Milton Santos (1993) demonstrated that Brazilian urbanization began at the coastline and moved to the interior in the end of the 20th century. As urbanization progressed in Brazil, agriculture workers' residence became progressively more urban and the old distinction between urban and rural Brazil disappeared. This led to the emergence of million-inhabitant cities, intermediate cities, and local cities, all of which adopted a sprawling geographical growth model, which is both a cause and an effect of land speculation.

Milton Santos (2004) in another article claims that it is important to recognize that urban moves alongside its society. Space offers things to some and refuses them to others, it selects the location of human activities, it has its own characteristics and working methods. Therefore, it is the result of collective action reproducing social relations.

Thus, when examining urban environmental justice, Jason Corburn (2017a) affirms that urban neighborhoods tend to concentrate and to place vulnerable people in toxic environments. It segregates the poor and the Afro-descendants in places that are disproportionately exposed to higher environmental risks, such as air pollution, lead contamination, polluting factories, lack of basic sanitation, among others.

This led to the development of peripheral areas in the margins of society, in which land speculators and the state have little interest. These become "poverty isles," attracting the most disadvantaged who often live in sub-human conditions. This population often lacks access to jobs, goods, and essential services in the periphery and has to commute to central city areas to obtain these. This commute feeds the urban crisis, impoverishes the

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commuters, and degrades their life. Hence, the city itself becomes a co-creator of poverty, due to state and real estate abandonment (Santos, 1993).

According to Roberto Lobato Corrêa (1989), urban space is a set of different uses of land, which may be defined as city spaces, where a set of activities happens among houses and buildings, leading to economic, social, and cultural activities. These uses define areas such as downtown areas (where commercial, managerial and service activities are concentrated), industrial areas, residential areas, leisure areas, among others. All parts have a special relationship with each other, but with varying intensities. Thus space mirrors society, where political practice and cultural diversity take place. It is economically produced, transformed and appropriated according to rational and emotional actions. This complex use of lands is the spatial organization of cities or urban space. It is a fragmented, articulated space that shapes social actions and mirrors them as well. It can be understood as a set of symbols and a place for struggles, especially class struggle.

This city building model quickly became unsustainable. The lack of planning resulted not only in segregation but also in issues such as pollution, poor urban mobility, violence, natural resources depletion, energy deficiency and lack of waste disposal areas. This sparked the need for change and resulted in the development of smart city projects. In contemporary thinking, smart cities should also be sustainable and human, as pointed out by Albino, Berardi and Dangelico (2015). They claim that cities should also meet people's needs with sustainable solutions for their social and economic issues.

Thus, investing in the concept of smart, humane, and sustainable cities by using technology to create sustainable, efficient and safe urban space for the future is a way of solving the issue of inequality. New, emerging aspects of urban planning have started to be discussed in light of the digital era, where the distribution of urban space in the context of capitalist expansion has gained a new format.

All structures of a smart, humane and sustainable city (such as energy, water, transportation, sanitation, etc. sectors) are projects, built or kept with the use of advanced resources and materials. These include sensors, electric devices and integrated networks that interface with computerize systems comprised of databases, tracking devices, and decision-making algorithms. Hence, the ideal city of the future is based on the integration of science and technology through information systems. This future demands a rethinking

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of the relationship between governments, city authorities, businesses, universities, and the scientific community (Pires, 2020).

2.3 Communities and vulnerabilities

According to Madeiros, Grigio and Pessoa (2018), population growth, fast urbanization, the weakening of governments, the building of households in improper spaces, increased wealth inequality, and human impacts on the environment are some of the factors that lead to environmental inequality and that foster vulnerability in cities, especially in their peripheries and for many of its inhabitants.

According to Cole et al. (2017), studies of environmental justice demonstrate that most environmental negative effects are concentrated among lower income populations and racial or ethnic minorities. Many epidemiological studies have also documented the role that spatial socioeconomic and racial segregation play when studying the inequality of health geography. Segregation leads to extremely unequal exposure to worse social and physical neighborhood environments and to the concentration of poverty and reduced economic and educational opportunity. Moreover, the physical aspects of neighborhoods, such as the presence or lack of parks, pedestrian infrastructure, or retail spaces for healthy food, may also affect the residents' health.

Neighborhoods with a high proportion of socially vulnerable residents are also those that experience a growing deterioration of the built-up environment protecting health and property. For example, these neighborhoods have less access to jobs, transit and quality healthcare or public services. They also are more likely to be located next to undesirable facilities, such as residue incinerators, waste dumps, or refineries, which may lead to public health issues (Meyer et al., 2018).

According to Madeiros, Grigio and Pessoa (2018), the lack of urban planning is one of the factors that makes cities and its inhabitants more vulnerable, exposing them to various risk factors that arise from chaotic territorial occupation processes. Furthermore, there are natural factors that have become more frequent and less rare due to climate change, such as torrential rains, earthquakes, prolonged droughts, among others. The authors claim that these disasters, which have become more frequent throughout the world, are demanding stronger responses from city management, especially among the

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most vulnerable communities, which suffer the most from these adverse climatic conditions. Thus, its inhabitants are more likely to suffer the negative consequences of climate change or human-induced climate disasters, such as poor waste disposal, polluted water supply or lack of sanitation. The authors also claim that in Brazil, despite the existence of public and private policies for urban planning, authorities merely remedy issues instead of facing public calamities. These authorities spend more in containment or mitigation measures than in preventive ones. This is proof of poor allocation of public resources. Moreover, ghettos continue to be built up and urban space is occupied without any kind of urban planning.

According to Guedes et al. (2020), who compiled concepts from several authors, urban planning is the science of promoting several natural, social and engineering variables to guide the growth of cities and solve their problems. It also meets needs in order to provide a balanced urban life, predicting the adequate and feasible number of people for that space and satisfying their life, work, leisure and infrastructure (water, energy, transit, etc.) needs. In addition, urban planning must be balanced to meet current energy and resource production needs, without consuming the share of future generations. In other words, urban planning must be sustainable.

Corburn (2017b) claims that if the global community is serious about its sustainable development and environmental justice goals, then it must pay more attention to urban planning issues, especially in peripheral neighborhoods, and to living conditions and socioeconomic indicators that might promote healthcare and welfare equity.

2.4 Resilience

Resilience may be defined as the capacity of communities to reduce or adapt to risk vulnerabilities. It includes implementing environmental risk reduction strategies, increasing disaster readiness, and allowing for collective action. Generally, the government leads the most common resilience activities in built-up environments, such as risk mitigation plans, regulation, infrastructure investment, and land acquisition programs. Public participation in such processes might be limited to, or dominated by, interest groups or elite residents who have the time and resources to participate. In this case, marginalized racial minorities and low-income populations are less capable of

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influencing these actions, despite facing greater environmental and climate change risks (Meyer et al., 2018).

According to Madeiros, Grigio and Pessoa (2018, p.248) “ideally, cities should pursue a future of greater resilience and adaptation capacity to uncertain and riskier scenarios.” The authors claim that they should strive for a less unequal society, both socially and environmentally, in order to become more resilient to the natural and human-induced disasters. Furthermore, according to these authors, the goal of building a resilient city can only be met if all stakeholders are allowed to participate: from public authorities to the population. The latter’s participation is especially important, because they are aware of the issues and needs their residence areas face. In this case, residents must be aware of the risks that they are subject to and integrate these risks to their decision-making processes. When the community becomes an agent of change and takes part in decision-making processes, environmental justice and public management solidarity become attainable. Thus, cities can only become more resilient with support from their residents, participative management, and more governmental transparency.

2.5 Participative urban planning

Environmental justice and sustainable justice are mutually compatible, but oftentimes the desire to achieve greater equality is lacking in urban sustainability initiatives (Hornik, Cutts & Greenlee, 2016). Indeed, a hierarchy of organized interests influence urban planning processes. These interests control land use decisions, that is to say, where parks or open spaces should be built, where commercial or residential construction should be authorized, or even where industry should be allowed to remain. This hierarchy traditionally places greater value on economic growth and pays little attention to social equity, environmental sustainability, or health care promotion. Moreover, the lack of communication among stakeholders and a tendency for not taking into account overall neighborhood or district needs when planning how to use land also contribute to urban planning decisions that do not take into account health-care or welfare (Cole et al., 2017).

Urban spaces and health equality are two of the most challenging environmental health concepts of the 21st century. Currently, there is a higher share of people living in

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urban spaces than in any other moment in human history, and health inequality has been increasing. Health-care inequality disproportionately affects disadvantaged minorities. It is caused by avoidable social, environmental and political policies that shape mortality. Research and action show that connecting urban spaces and health-care inequality is a great challenge on the path towards urban environmental justice (Corburn, 2017b).

Although public health and urban planning have appeared with the common objective of preventing outbreaks of infectious diseases in urban spaces, nowadays there is little interaction between both fields. This separation has contributed to mismanaged public health efforts in urban spaces and a general failure in recognizing the linkages between, for instance, built-up environments and health-care inequality among low income populations and Afro-descendants (Corburn, 2004).

The result of this disconnect is that both fields have not been paying enough attention to economic, social, and political factors that contribute to health-care inequality. Thus, while public health is increasingly preoccupied with biomedical factors that may lead to different mortality rates among the disadvantage, it is has only recently begun investigating the role that land use decisions and that built-up environments play in health-care. There is little sign that urban planning will return to its original mission of addressing the health-care needs of residents and vulnerable communities (Corburn, 2004).

Urbanization and the building up of environments are the main driving forces of climate and environmental change and are both deeply linked to public health issues. For this reason, it is essential to discuss the role that urban environmental planning plays when paired with sustainable development and environmental justice. Together, these should provide the normative base for interdisciplinary research that takes into account the role of built-up environments in the creation of environmental liabilities and health inequality and that focuses on the inequality of climate consequences and health-care (Rosenthal & Brandt-Rauf, 2006).

One of the first principles of environmental justice is that communities should “speak for themselves” when characterizing the threats and risks they face, but also when talking about their opportunities and how to improve the community’s well-being. Community-based participatory research (CBPR) is a set of research methodologies that aims to transform scientific undertakings by involving communities in the research process. CBPR typically should involve academia-community collaborations in which

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knowledge and power are shared between the partners in all aspects of research: making, interpreting and acting upon science. Thus, the process aims to elevate a community's knowledge, including their history and the residents' biography, while simultaneously challenging the traditional power dynamics in research (Corburn, 2017a).

Collaborations between universities and communities in environmental justice should foster reciprocal long-term partnerships based on the community. The university and the residents co-produce knowledge and action towards a fairer, more sustainable and more democratic society (Loh, 2016).

In this case, a focus on participatory action-research can improve scientific knowledge and the community's resilience capacity relative to natural disasters and environmental justice. Evidence from recent research suggests that resident participation increases the assessment of environmental risks, raises awareness, and equips residents with the tools to fight for the equitable distribution of climate and environmental adaptations. However, risk assessment and urban planning processes frequently still take place within specialized groups, without significant community involvement. This fragmentation is partially caused by a lack of recognition towards a community's experiences with adaptation in built-up environments, but also due to a lack of educational tools that could foster engagement in built-up environment planning processes.

Jason Corburn (2017b) suggests that a more integrated relationship with the community is necessary to promote environmental justice and improve public health capabilities to deal with 21st century challenges. Future urban plans must focus on environmental public health when dealing with local public health. To this end, it should include practices such as involving the community in elaborating maps, considering health-care in all policies, promoting urban service ecosystems for health-care, and participative or integrated approaches to urbanize urban ghettos.

Thus, the first task of policy-makers responsible for urban planning should be to map relevant environmental inequalities, especially those related to health-care, in order to identify any necessary interventions. To this end, they should develop adequate indicators to map these environmental and socioeconomic indicators, which are based on public scientific evidence arising from local stakeholder contributions. Adequate planning interventions include mostly transportation plans and the management of green spaces, which include policies to improve air quality and reduce noise pollution (Flacke et al., 2016).

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One such example is urban transportation plans. Epting (2015a) highlights that cities should invest resources in implementing a public transportation system that is not only effective but also aesthetically pleasing to its users, because they will use it daily. They should also be aware that limited mobility is one of the issues that most affects poor residents in peripheral areas. Inadequate transportation affects many people. Planners and engineers should tackle the problem and deliver better results for residents and the environment.

Another fundamental issue is the urban environment where these vulnerable communities live. It is a well-known fact that neighbors and neighborhoods affect the social and physical well-being and health of residents. It is also known that exposure to green spaces is correlated with better physical and mental health indicators. Thus, it is necessary to improve the physical and natural environments of cities, especially in peripheral areas. To do so, authorities should build parks and gardens, because they can improve health by encouraging physical activity and social contacts, besides reducing stress and exposure to air pollution or environmental toxins. These green measures are frequently described as sustainability or resilience measures and are central to achieve a “healthy city.” Urban planning and building city infrastructure around healthy urban environments is essential to achieve better health and environmental results for disadvantaged residents (Cole et al., 2017).

Nevertheless, it is important to note that improvements in peripheral neighborhoods such as the creation of new green or leisure spaces, better lighting, safety, sanitation and infrastructure often lead to gentrification processes and increased real estate prices in that neighborhood. This causes land speculation to act and increase the price of houses and rents. This causes higher-income people to move to these neighborhoods and old residents are pushed out because they can no longer afford what land speculators demand to continue living in these areas. Thus, it is essential to differentiate between a neighborhood revitalization process and a gentrification one. The latter is always associated with land speculation.

In other words, the revitalization of a neighborhood should always have as its prime objective to benefit residents and taxpayer money should be spent on necessary improvements. But whenever this “revitalization” is associated with land speculations, residents’ interests are set aside and the focus becomes on earning profits from increased real estate prices, oftentimes thanks to taxpayer investments since the improvements are

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usually paid for by the state. For this reason, decisions regarding neighborhood improvements should not be taken “top-down.” They should involve residents. Epting (2015b) points out that inviting residents to conversations about decisions that will have a direct impact on them is fundamental because it gives them a role in defining their community’s identity. This union attitude is an important step towards participatory urban planning, which mitigates the damage of a possible future gentrification.

Meyer et al. (2018) suggest that a participatory urban planning project to build resilience should be based on a feedback loop cycle of transferring knowledge between researchers and engaged stakeholders in a socially vulnerable community that seeks environmental justice. It should have the following aims: 1) to fully understand the extent of the risk that the community faces; 2) to align research aims with the community’s vision of environmental justice; 3) to disseminate new knowledge in a culturally-appropriate manner; 4) to allow community partners to act in a set of strategies based around empirical reality. This method demands that specialists and researchers work side-by-side with partners and community residents to improve their resilience. To achieve co-learning and total environmental, it is essential to establish partnerships and develop a unified agenda that fosters truth. Creating and assisting a “learning ecosystem” results in better understanding of complex issues among all project participants and employs approaches and processes that support community empowerment.

Nature-based solutions (NBS) have been increasingly applied in existing urban planning projects throughout the world to guide landscape projects and create resilient cities that can achieve economic development goals and provide results that benefit society and the environment. The NBS concept is deeply correlated with other concepts, such as sustainability, resilience, service ecosystems, and the coupling of human and environmental resources with green infrastructure. Furthermore, NBS are more effective and affordable development approaches than traditional ones (Lafortezza et al., 2018).

This line of thinking is underpinned by discoveries from the scientific community, which shows the need to transform “gray” buildings into “green” infrastructure in order to restore ecological balance within urban landscapes. This will allow for the development of healthier societies and more resilient ecosystems. This premise is based on the essential role that nature plays in providing ecosystem services that support the economy and the subsistence of humans. The benefits of investing in restoring green infrastructure in urban

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areas are not only ecologically and socially desirable, but also economically advantageous (Lafortezza et al., 2018).

Finally, there is a greater need to examine how different stakeholder groups build change theories within their realities in order to promote environmental justice. But these theories should correspond to change expectations relative to justice and sustainability. To make these theories real, stakeholders should define what are their environmental justice concerns, what processes they believe cause this injustice, and what resources may be used to achieve the changes they desire. Therefore, the objective is to obtain relevant elements from different theories and to highlight similarities and differences among them, finding ways to promote participatory urban planning and offer benefits to communities (Hornik, Cutts & Greenlee, 2016).

3 GENERAL CONCLUSIONS

Taken into account the data provided in this article, it can be concluded that there is no ready-made solution to solve urban inequality issues in cities nowadays. There is no policy that addresses the complex social processes that lead to urban inequality in different contexts.

To answer the research question of this paper and its main objective, the main conclusion is that the solution to poorly-planned cities is to develop a participatory urban planning framework that incorporates environmental justice and sustainable development. To do so effectively, it is necessary to build resilience in vulnerable communities by empowering their residents with the concept of urban environmental justice.

The partnership among residents, government and scientific community can help to identify the main issues that affect these communities and allocate the necessary resources to solve them, solving issues such as lack of sanitation or waste disposal services, lack of street paving or poor street lighting, the maintenance of dump areas, risk assessment for buildings in hill or riverbank areas, among others. This reduces the spread of disease vectors and the risk of floods or landslides, while increasing security and providing other benefits.

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The absence of leisure areas, schools, daycare centers, parks, as well as poor transportation infrastructure and exposure to pollution, among other issues, also affects these communities. Addressing these issues improves the safety, health, and quality of life of these populations, and ultimately saves taxpayer's money that would have been otherwise been spent on health-care.

However, these is the great issue of land speculation. It seeks to direct government policy and investments towards its own financial interests and to promote infrastructure improvements only in neighborhoods whose real estate market could be exploited in the future for higher profits. This leads to gentrification and it drives out old residence, who once again lose their right to good housing.

Nevertheless, it is necessary to support good urban planning and encourage teamwork, uniting residents from vulnerable communities to local governments and the scientific community in order to create resilient cities and neighborhoods for this population.

Indeed, the debate around environmental justice should be re-oriented to take into account social segmentation. It is essential to consider how cities are built and expanded, because current processes merely reproduce and foster poverty, inequality, and racism. They overload vulnerable communities and populations with a higher share of pollution and adverse climate effects. It is essential to invest in urban planning that incorporates community participation to improve residents' quality of live and deliver environmental justice.

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