



## THE CONTRIBUTION OF THE KNOWLEDGE SOCIETY TO THE ECO DEVELOPMENT AND THE SMART CITIES.

*A CONTRIBUIÇÃO DA SOCIEDADE DO CONHECIMENTO PARA O ECODESENVOLVIMENTO E AS CIDADES INTELIGENTES.*

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Trabalho enviado em 19 de outubro de 2020 e aceito em 05 de maio de 2021



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Rev. Dir. Cid., Rio de Janeiro, Vol. 14, N.02., 2022, p. 855-26.

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DOI: 10.12957/rdc.2022. | ISSN 2317-7721

## ABSTRACT

This paper analyzes the elevation of technological development, corroborated by the institution of the Knowledge Society as a pillar to reaffirm the concept of eco-development, to point out how both contribute to the promotion of sustainability at the municipal level and affirmation of the right to the city. Modern society is composed primarily of urban centers and the interconnected citizens. That way, the object of the research is to clarify how the implementation of Smart Cities, through Information and Communication Technologies (ICTs), reveals itself as an important tool for environmental preservation in Brazilian cities. The choice of theme is justified by the inevitability of technological development and the need for these tools to be used for the protection, reconstruction and monitoring of the environment in the context of Smart Cities. For that, we applied the dialectic-legal approach method, associated with bibliographic research. As a result, it is possible to observe the remarkable influence of citizens' connectivity to raise the level of eco-development, however, it is indispensable more public and private investment in this area.

**Keywords:** Technology; Ecodevelopment; Smart cities; Urbanization; Sustainability.

## RESUMO

O estudo analisa a elevação do desenvolvimento tecnológico, corroborado pela instituição da Sociedade do Conhecimento como pilar de reafirmação do conceito de ecodesenvolvimento, a fim de apontar como ambos contribuem para a promoção da sustentabilidade em âmbito municipal e afirmação do direito à cidade. A sociedade moderna é composta, primordialmente, pelos centros urbanos e pelos cidadãos interconectados que os compõe. Deste modo, o objeto da pesquisa pauta-se em esclarecer como a implementação das *Smart Cities*, por meio das Tecnologias da Informação e Comunicação (TICs), revela-se como importante ferramenta de preservação ambiental nos municípios brasileiros. A escolha do tema se justifica pela inevitabilidade do desenvolvimento tecnológico e a necessidade de que este aparato seja destinado à proteção, reconstrução e monitoramento do meio ambiente no contexto das cidades inteligentes. Para tanto, aplicamos o método de abordagem dialético-jurídico, associado à pesquisa bibliográfica. Como resultado, é possível observar a notável influência da conectividade dos cidadãos para a elevação do patamar do ecodesenvolvimento, sendo certo, no entanto, que maior investimento público e privado nesta seara se faz indispensável.

**Palavras-chave:** Tecnologia; Ecodesenvolvimento; Cidades Inteligentes; Urbanização; Sustentabilidade.



## INTRODUCTION

The development and growth of societies throughout the history of humanity go through long and successive processes of change in the behavior of citizens, evidenced by the modification of political, economic, environmental, consumption, behavior, moral values, permeated by the demand for improvement of group experience.

The 21st century, in turn, is consolidated as one of the greatest precursors of this evolution, which is due, among other aspects, to factors such as the intensification of industrialization, technological development, the massification of relationships, the exponential increase in the number of internet users and the creation of social networks<sup>1</sup>.

The spread of connectivity, accompanied by technological immersion, has influenced the way cities develop, perpetuating them as locus that create new opportunities by interconnecting services and bringing people together, confirming that they have long promoted an improvement in the quality of life through the range of housing, employment and study options, factors that have become determining factors in attracting migrants and encouraging rural exodus.

The urban centers, which housed about 56% of the national population in 1970, have been increasing their scope and, consequently, the organizational structure in a staggered way, being able to accommodate, until 2050, 90% of the world population, according to data collected by the Organization of Nations, and made available by the Institute of Applied Economic Research – IPEA (2006).

In this light, the right to the city – which is based on the concreteness of social participation, on the right to inhabit, to take part, to socialization, appropriation and quality of life – reaches another level in the technological society that, in turn, is backed by easy and instantaneous access to knowledge, connectivity and information.

As a result, it is no longer sufficient to provide residents of urban centers with an experience based on the availability of human labor and traditional means of communication, production of inputs and transport, as modern life itself demands other imminent needs, in addition to the basic ones. accepted until then, such as the promotion of internet access throughout the territory and the availability of online public services.

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<sup>1</sup> The social network Facebook went from 150 million between 2009 and 2011 to 2.17 billion active users in 2018 and 800 million active users on Instagram in 2018, according to information from the North American network WE ARE SOCIAL (2019).



The change in parameters is also verified in the means and modes of production of goods and services, and the extraction of finite environmental inputs in an unlimited way is no longer accepted, without the consequent environmental compensation, which makes technological development an ally in the search for a common denominator between urban expansion, the concretion of eco-development and sustainability in cities.

The intersection between the promotion of the right to the city, access to information and an ecologically balanced environment, as fundamental guarantees listed in the Federal Constitution of 1988 (arts. 5, 182, 183 and 225), is found in the implementation of smart cities (smart cities) that, backed by the dissemination of Information and Communication Technologies (TICs)<sup>2</sup> in the most diverse fields, they present a city model based on the connection of services, environmental protection and the promotion of social well-being through technology.

In this context, the research bases its theme on the study of the new demands of the urbanized and technological society, and how to weigh them in the face of the finitude of natural resources. The hypothesis put forward is that smart cities, as a result of the Knowledge Society, are prerequisites for increasing eco-development in postmodern cities, so that Information and Communication Technologies (ICTs) can be directed towards environmental preservation.

It begins with the rural exodus and its impacts on the conception of the city, bringing to light the main points about the right to the city as being fundamental to the citizen. Afterwards, we point to ecocodevelopment as a concept in parallel with sustainable development, clarifying the common points and incompatibilities between both, and then developing the hypothesis of smart cities as a way of mediating the environmental damages of urban development and growth, guaranteeing rights fundamental to the city and to information.

The research was prepared by applying the dialectical-legal approach method, associated with bibliographic research to support the main argument that smart cities are a consequence of the Knowledge Society and increase eco-development through technological innovation.

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<sup>2</sup> Information and Communication Technologies (ICTs) are defined by Almeida as “an acronym that was initially used in the United Kingdom, in a proposal for a school curriculum developed in the late 1990s. The concept of ICTs was widely disseminated around the world with the popularization of Internet. The expression refers to any type of technology that handles information and helps in communication, which can be in the form of hardware, software, network or mobile phones in general” (2019).

## 1. URBANIZATION AND THE RIGHT TO THE CITY

The history of humanity is permeated by successive geographical, sociological and philosophical studies about the creation and development of cities. In his contribution to the theme, Aristotle alludes that “every city is a type of association, and every association is established with a view to some good” (2001, p. 53-56), which reaffirms the human intention to fight loneliness. through the act of getting together, since man, according to the same author, if he did not have his existence based on aggregation through the city, he would be a vile being.

Another important conception is brought by Plato (2002), who outlines in his work “The Republic” the idea of the perfect city. In it, he describes that the ideal society should be based on the full application of justice, wisdom, beauty, happiness and virtue. This perception, however, is marked by empirical intangibility, even recognized by the author himself, since human behavior, by its essence, prevents that utopia from materializing.

The city is a crucial point of human society, whereas, before the formation of the State, even small agglomerations held their territory, sovereignty and people, and currently, metropolises and megalopolises, by themselves, represent a significant portion of the world population<sup>3</sup>, which makes urbanization an important presupposition for the development of humanity.

Primarily represented by the rural exodus and consequent expansion of urban centers by capitalism, the urbanization process had as its historical landmark the First English Industrial Revolution, which took place in the second half of the 18th century.

The transition from manual work to the machine, or to the machine-made work of the textile industries, evidenced the existence of a new reality based on the expansion of internal and external trade, characterized by factors such as the increase in population, the ease of labor, the dissemination of consumption, the improvement of international relations through the viability of exports, among others.

The sociologist Castells (2014) , who analyzed in his work the urbanization that took place in several Latin American countries, including Brazil, concluded that the phenomenon is due to the combination of several factors, such as the strong imbalance in the urban network for the benefit of a preponderant agglomeration, which causes insufficient employment and services for the new urban masses and, therefore, accentuation of ecological segregation by social classes and polarization in the

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<sup>3</sup> Examples of this argument is the joining of the population of Honk Kong, São Paulo and Shanghai, Mumbai.

level of consumption. On the other hand, he reported that there is no correlation between industrial employment/urbanization, but an association between production, industrial and urban growth.<sup>4</sup>

About the phenomenon, Mastrodi and Vianna (2017) allude that one of the most striking consequences of this process of industrialization and urbanization was the excess of manpower, which made workers submit to excessive working hours, without forgetting about the low wages and, consequently, to the appalling living conditions.

As a result, the structural capacity of cities collapsed in the face of insufficient infrastructure capable of supporting population convergence to large centers, which led to the proliferation of diseases and an increase in poverty and mortality rates, since there was not even housing for everyone, perhaps minimum hygienic conditions.

Although the correlation between industrialization and the unbridled growth of cities is evident, what should be highlighted are the consequences of the capitalist core based only on economic elevation to the detriment of the promotion of social well-being and that culminated, in the present context, in real urban crises.<sup>5</sup>

The working days of 1848 that took place in Paris are examples that demonstrate the growing urban democracy based on the struggle of workers for better working conditions, for Guimarães and Araújo (2018), the movement had as a response the application of a capitalist policy headed by the Baron of Haussman<sup>6</sup> which, among other measures, expelled the working class from the center of the city, considering it as a threat to the interests of the dominant bourgeoisie.

Effervescent from this marginalization, in addition to various social movements, the work considered a theoretical framework about the right to the city, launched in 1968 by the Marxist philosopher Henri Lefebvre, called *Le droit à la ville*.

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<sup>4</sup> In Castells' words, "Latin American urbanization is characterized, therefore, by the following characteristics: urban population that surpasses the correspondent to the productive level of the system; in the direct relationship between industrial employment and urbanization, but the association between industrial production and urban growth; strong imbalance in the urban network for the benefit of a preponderant agglomeration; increasing acceleration of the urbanization process; insufficiency of employment and services for the new urban masses and, consequently, accentuation of ecological segregation by social classes and polarization of the stratification system at the level of consumption".

<sup>5</sup> A clear example of the government's negligence regarding the increase of cities is verified by the growth of communities in Rio de Janeiro and São Paulo that, without a minimum of infrastructure to be provided to residents (which often result in landslides, fires, floods, etc. ) bravely subsist without any prospect of changing this calamitous situation.

<sup>6</sup> Georges Eugene Haussmann was a French urban planner who redesigned Paris under Napoleon III. His projects exerted a great influence on urban planning at the time, including in Brazil, as in the case of the construction of the city of Belo Horizonte and the reconstruction of Rio de Janeiro in the early 20th century. Available in: <https://www.britannica.com/biography/Georges-Eugene-Baron-Haussmann>. Accessed in: 1º dez. 2019.

In it, the author defends the democratization of the city as an indispensable form of social participation by stating, according to the conception of Guimarães and Araújo (2018, p. 1789) that “life in the city is based on the diversity and coexistence of the different, presupposing encounters and confrontations of differences, knowledge and reciprocal recognition, including from the ideological and political point of view, of the ways of living, of the 'patterns' that coexist in the city” so that everyone, together, create space through their individual interference.

Therefore, Lefebvre (2008) elevates the right to the city to a higher level than other rights, as it essentially concatenates other essential guarantees such as the exercise of freedom, socialization, habitat, inhabiting, creation and appropriation. All of these, according to his conception, make up the right to the city and, mainly, guarantee its exercise.

Another highlight of the work is the idea that the mere construction of houses or the provision of other material goods by the State does not constitute the exercise of the right to the city, thus making the merely economic guidelines that do not guarantee the true exercise of the right to the city insufficient and superficial. social participation by the population (LEFEBVRE, 2008, p. 138).

This understanding contrasts with the paternalistic social policies of Brazil, especially with regard to the government incentive granted to housing programs for the construction of affordable housing, which, according to Lefebvre, would be insufficient for the realization of the legitimate right to the city.

This is the central idea that, starting from the individual, the locus in which he is must distribute, at least approximately, the resources necessary for the enjoyment of elementary rights to his experience, which is also directly correlated with the level of of happiness experienced by the citizen, whereas, according to Hilário and Porto (2018, p. 160), “the link between them resides in the focus on freedom as a presupposition of the empowerment of individuals, social actors protagonists of new patterns of urbanization and development guided by the thirst for happiness”.

From another angle, the Marxist geographer David Harvey (2012) alludes that the right to the city is the right of those who compose it to substantially change its essence and everything that is part of it. The author adds that the city must be seen as a political body, which has a character, a role to play and that the construction of its type cannot be divorced from the citizens' relationship with nature, from the chosen lifestyles, from the technologies and ethical values, and the product of the uniqueness of these factors should appear (HARVEY, 2012).

Furthermore, it states that urban policy practiced in cities will only make sense when those who build it understand the existence of an inalienable right to create a space more in accordance with

their true desires, than just being based on capitalist conceptions, which produces cities. based on reproduction and accumulation, as in the North American models (HARVEY, 2014).

Harvey's conception, however, is criticized by Nonato, Dias and Raiol (2017) based on the assumption that the effective exercise of the right to the city consists of the power to change and reinvent it, this right being more collective than individual, considering that it inevitably depends on the exercise of collective power over the urbanization process.

In contrast to theorists, at the empirical level, Conduki (2018) alludes that the realization of the right to the city in Brazil begins with the recognition that it was the responsibility of the State to guarantee basic conditions of housing and infrastructure for all, which is consolidated during the Vargas and, later, at the Seminar on Housing and Urban Reform<sup>7</sup>, in 1963, but did not take hold due to the establishment of the military regime between 1964 and 1985.

With the resumption of democracy and, consequently, of popular participation and social demands, discussions on the subject returned to the agenda during the period of establishment of the constituent, which reverberated in the positivization of the chapter destined to urban policy, with emphasis on the articles 182 and 183 in the 1988 Federal Constitution (BRASIL, 1988) which, however, had limited effectiveness, lacking discipline by the infraconstitutional legislator.

It was only with the edition of the City Statute (BRASIL, 2001) that this fundamental guarantee was finally consolidated in the national order, providing for topics such as the social function of the city, urban ownership, public regulation of the land, the confrontation of distortions of growth urban and democratic construction of cities.

Another highlight is attributed to the signing of the World Charter for the Right to the City (2006), which is based on “constituting itself as a platform capable of articulating the efforts of all those actors – public, social and private – interested in giving full force and effectiveness to the to this new human right through its promotion, legal recognition, implementation, regulation and practice”, showing even more in national lands the indispensability of affixing this right at the fundamental level.

Therefore, the promotion of the right to the city reveals itself as a fundamental presupposition for the exercise of citizenship, and, in the absence of that, it will remain essentially harmed and, consequently, violated.

Thus, the concomitant consolidation of the various aspects that make up cities is essential for citizens to be properly evidenced as subjects of transforming rights in the municipal gear. The

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<sup>7</sup> For Conduki (2018, p. 21): “The 1963 seminar systematized a set of well-designed proposals to implement the main institutional instruments needed to tackle housing and urban problems, based on the binomial industrialization and planning”.

discussions on the right to sustainable cities and all the public and private apparatus necessary for this emanate from the effectiveness of these guarantees, starting from the assumption of urbanization so that we can reach the parameter of sustainability.

## 2. SUSTAINABILITY AND ITS FUNDAMENTALS FOR ECODEVELOPMENT AND SUSTAINABLE DEVELOPMENT

Unlike growth and development<sup>8</sup> of cities, which is expected to be continuous, natural resources are finite, so the effects of unbridled urban expansion have directly influenced the increase in degradation due to consumption growth, large production of solid waste, irregular disposal, waste, etc.

This statement is confirmed by the World Wide Fund for Nature - WWF (2012) when projecting that, if the world consumption of natural inputs continues at current levels, by the year 2050 two more planets will be needed to supply the food and production needs for all. , which raises even more the concern about the planetary biocapacity<sup>9</sup> and sustainable means of growth and development in cities.

Just as technical-scientific progress gave man the power to transform, renew, review and reformulate his own essence, which, for Tassarolo, Krohling and Pertel (2013), made him responsible for the future of humanity, attributing it to the obligation to act on the inertia about the environmental deterioration and the extirpation of natural resources by the increase in consumption and economic power.

About this responsibility, Hans Jonas (1995, p. 227, our translation) alludes that:

In the age of technical civilization, which has become omnipotent in a negative way, the first duty of collective human behavior is the future of men. It clearly contains the future of nature as a sine qua non; but, moreover, independently of him, the future of nature is his metaphysical responsibility, since man has not only become a danger to himself, but also to the entire biosphere.<sup>10</sup>

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<sup>8</sup> In this context, growth is understood only as the numerical, quantitative increase, therefore, of the residents of a certain place and of the GDP; urbanization, understood as a phenomenon inherent to the change from rural life to insertion in cities and industries; and development is subsumed under the idea of a qualitative and quantitative increase in the population and its corresponding quality of life, in order to compose housing, consumption, wage base rates, among others.

<sup>9</sup> Planetary biocapacity, according to WWF, is calculated based on two parameters, which are (1) the capacity of ecosystems to produce renewable natural resources for human consumption and (2) the capacity to absorb waste generated by the population.

<sup>10</sup> Original text: "In the age of technical civilization, which has become omnipotent in a negative way, the first duty of collective human behavior is the future of men. In it is clearly contained the future of nature as a sine qua non condition; but in addition, independently of it, the future of nature is under a metaphysical responsibility, since the man on the ground has become a danger for himself, as well as for the entire biosphere". (JONAS, 1995, p. 227).

Discussions about the environmental theme have gained deserved evidence in the national and international context since the Stockholm World Conference<sup>11</sup>, held in 1972 which, considered a landmark<sup>12</sup>, In the year following its completion, it triggered the creation of the ecodevelopment theory which, although launched by Maurice Strong, who was secretary at the Conference, became widely disseminated based on studies carried out by economist Ignacy Sachs.

The concept is based on the need to establish a consumption ceiling, reinforcing the danger of believing that natural resources would be infinite and regenerable, in order to, before that, define that the management of natural resources must guarantee the enjoyment of the current generation without prejudice. of future ones (SACHS, 1991).

According to Sachs (1991), eco-development is based on the harmony between social and economic objectives, while neither of them should be annulled in favor of the other, recognizing both as promoters of development. The hypothesis makes possible a prudent ecological management capable of evoking new lifestyles, new visions of the future and new sets of environmental values.

When looking at the time horizon decades or centuries ahead, the ecodevelopment theory points to the importance of a diachronic solidarity, in which the needs of future generations are guaranteed, in an intergenerational way, without the lack of commitment to present generations, which is explained by Layrargues (1997).

In this same sense, Montibeller Filho (1993) states that the ecodevelopment theory presupposes diachronic solidarity by shifting perspectives to the production of the fundamental needs of the current population, without forgetting about the economy and replacement of natural resources to guarantee future generations the enjoyment and development.

Therefore, the concept establishes itself as a diffuser of the world development agenda without, however, ignoring the finite environment as a propellant to be defended. This is because it seeks to find a common denominator between both, warning that the full and unlimited satisfaction of the present generation will culminate, in addition to the depletion of resources, in the violation of the right to the environment that must be guaranteed to future generations, which, consequently, will influence development.

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<sup>11</sup> Despite the undeniable importance attributed to the discussions at the Stockholm Conference, the Report of the Brazilian Delegation conveys that the limitation of dialogue and the attempt to attribute “blame” to certain countries hampered the deepening of the discussions. Available in: <[https://cetesb.sp.gov.br/proclima/wp-content/uploads/sites/36/2013/12/estocolmo\\_72\\_Volume\\_I.pdf](https://cetesb.sp.gov.br/proclima/wp-content/uploads/sites/36/2013/12/estocolmo_72_Volume_I.pdf)>.

<sup>12</sup> In addition to the Stockholm Conference, emphasis should be given to the Rio de Janeiro Conference called ECO 92 and the edition of the document Our Common Future in 1983.

In contrast, and with the aim of complementing the discussion, a new vertex, called sustainable development, emerged within the scope of the United Nations, more precisely in what became known as the Brundtland Commission, in 1983.

The concept emerged in a document from this Commission, in which, named “Our Common Future”, it dealt with the subject, conceptualizing sustainable development as being capable of meeting the needs of the present without compromising the ability of future generations to meet their needs. own needs (UN, 1987).

Despite the similarity with what was presented as ecodevelopment, it is imperative to highlight the existence of several theoretical inconsistencies to refute the claim that they would be equivalent.

Although both share the same goals, namely, that the preservation of the environment for future generations is an ethical principle and that the environmental component must be considered concomitantly with the economic one, Layrargues (1997) points out that the divergence lies in the strategy ideology of pursuit of the objective.

This is because sustainable development seeks to improve the standard of living of Third World countries, in order to make possible the equivalence of consumption leveled up, to the North American standard, believing that technological development will allow all peoples to have access to plenty. In this logic, social justice proves to be flawed since it is impossible to equate the energy consumption of developing countries with the standard of developed countries without this resulting in the total collapse of the entire world supply system.

On the other hand, eco-development postulates, with regard to social justice, finding a middle ground by establishing a consumption ceiling below the current one for the First World and, with that, enabling equalization with those who are in development, distributing the matrices energy and equating the levels of enjoyment (LAYRARGUES, 1997).

In the last decades, the understanding of what would be sustainable development evolved not only by modifying the general understanding of its objectives, which previously demonstrated a preponderantly political intent, but also by new parameters about environmental and ecological sustainability, pointing out, according to Pinheiro (2012) for an expansion of the extension of this concept and consequent increase of the complexity of its content.

In national lands, the Federal Constitution dealt with sustainability when disciplining, in art. 170, the general principles of economic activity. Furthermore, art. 225 by providing for the right of everyone to an ecologically balanced environment, recognizing its essential character to a healthy quality of life, imposing on the public power and the community the duty to defend and preserve it for present and future generations (BRASIL, 1988). ).

Sustainability is also mandatory at the municipal level according to the provision of art. 2, item IV, of the City Statute, which provides, regarding urban planning and development, that the spatial distribution of the population and economic activities must avoid and, if necessary, correct the distortions of urban growth and its negative effects on the environment. environment, thus striving for systemic balance.

The positivization expressed from the precept in the legal texts is a bet and a warning from the legislator so that man, regardless of his beliefs, can become aware of the real danger that he himself represents for the planet, which, according to Queiroz, Brito and Silva (2016) aims to induce him to reduce the predatory intent regarding the prioritization of the economy over the environment.

In this perspective, and despite the differences mentioned above, the basic value of sustainability stands out to ensure that, even at the municipal level, economic growth and development are guided by the balance between the exploitation and preservation of natural resources.

### 3. SMART CITIES IN THE CONTEXT OF THE KNOWLEDGE SOCIETY

The ability or inability to dominate technologies, especially those that are strategically decisive in each historical period, is, according to Castells (1999), a determining element in shaping the destiny of societies.

Technological development, until then represented by the industrial revolutions and their replacement tools for manufacturing, has substantially changed with the advent of Information and Communication Technologies (ICTs) and the internet, reinforcing the human capacity to conceive innovations capable of modifying the experience in society to form new needs and, thus, influence forms of consumption, outline behaviors, impose moral and civic standards, etc.

The paradigm shift implemented by the emergence of cyberspace<sup>13</sup> is primarily characterized by the creation and diffusion of connectivity from the 1990s onwards, in which, through the World Wide Web (WWW), which we currently know as navigators or browsers, the user, who previously only accessed information produced by others, was placed in the pole of active contributor of the content available on the web.

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<sup>13</sup> For Nascimento (2012): “The word cyberspace was a neologism created in the 1980s and makes evidence of cybernetics, a transdisciplinary scientific current of the 1940s and 1950s, which enshrined the notions of information and communication in the scientific world”.

Bilateral access by Internet users confirms the exploratory potential of this qualitatively differentiated and non-fixed space that is cyberspace, which for Levy (1996) is currently supported by Information and Communication Technologies (ICTs).

This established reality appears, as outlined by Castells (2003), as a “Network Society”, which is the result not only of the advent of digital technologies, but also of the substantial transformation caused in the essence of the human being, which emerged a new socio-technical standard. of living in postmodern society.

For others, this novel scenario is better characterized as a “Knowledge Society”. The terminology is an alternative to what was also called the “Information Society”<sup>14</sup>, and was first invoked by Fritz Machup, in 1962, in *The production and distribution of knowledge in the United States*, having the concept later developed by Peter Ducker, in 1966, in *The age of discontinuity* (CRAWFORD, 1983).

The Knowledge Society paradigm is fundamentally characterized by the elevation of information to the level of raw material when considering that the technologies developed have started to allow man to act in a specific way in the management of information. The high penetrability of the effects of ICTs as an integral part of human activity is also a prominent factor, according to Whertein (2000), in this scenario information becomes part of all individual or collective human activity.

It is noted, therefore, that the deepening of technologies culminates in the rise of a new model of economic development capable of, at the same time, provoking deep and extensive alterations of evaluative standards in the social and political structures of societies (AMARAL, 2008).

Data collected by the United Nations - UN (2019), reinforce the exponential expansion of the internet, considering that in 2016, out of a total of 7.444 billion people inhabiting the planet, 3.2 billion already have access to the internet<sup>15</sup>, and in 2018 this number reached 57% of the world population, showing a growth of 7% compared to 2017.

Such was the appreciation of connectivity as an instrument for the development of peoples, that the Organization had equated it with a right of humanity when it stated that the tool “has become a fundamental means by which individuals can exercise their right to freedom of opinion and expression, as guaranteed Article 19 of the Universal Declaration of Human Rights and the

<sup>14</sup> “The Information Society concept comprises the systematization of a set of scientific and technological transformations driven by the development of microelectronics, information technology and their associated technologies, notably after the outbreak of the Second World War”. FUNDAÇÃO JOÃO PINHEIRO, 2010, p. 11.

<sup>15</sup> “The universe of the 57% of the population offline – about four billion people – is mainly concentrated in the African continent. While 21% of the population in Europe do not have access to the internet (in developed countries in general, about 80% of the population are online), in Africa this percentage of disconnected reaches 75% of the population”. PIOVESAN, 2016.

International Covenant on Civil and Political Rights” (ONU, 2011)<sup>16</sup>, to denote not only the timelessness of the pact, but also the need to reaffirm the guarantees provided therein, which, brought to the present time, reinforce that the correct exercise of freedom of expression and opinion must be ensured in its entirety and regardless of the tool used to do so much.

Despite the global message, in Brazil the UN pointed out that the country's sustainable development is directly related to the duty to significantly increase access to Information and Communication Technologies (ICTs) by the population and to improve the provision of the service, both geographically, because it must be offered equally throughout the territory, as well as economically, through cost adequacy (UN, 2015).

The population's interest in technologies and the ease of access to information provided by them points to the tool's popularity, especially through social networks, so that:

This technological integration has become emblematic through the popularization of smartphones, the advent of social networks and the use of the most varied technologies in the daily environment of the person. The internet has become a digital world, with an immense flow of people and information. (NUNES; LEHFELD, 2018, p. 2).

Furthermore, notes confirm the importance of connectivity in the life of Brazilians, who devote, on average, 9 hours and 14 minutes of their daily time to online activities, second only to Thailand (9:38h) and the Philippines (9:29h) (WE ARE SOCIAL, 2019).

The technological culture of Brazilians, guided by digital immersion in the most diverse areas of life in society, has given new meaning to the way cities develop and present themselves to the citizen, making the integration of ICTs a way to fulfill the right to the city and, consequently, the promotion of eco-development. Directing efforts so that there is adequate planning in cities, including in the environmental field, can find decisive contributions in technology, according to Santiago and Payão (2018).

The meeting of these vertices is promoted by the advent of smart cities. For Santiago and Payão (2018), a city can be defined in this way when investments in human, social capital, infrastructure, communication, sustainable economic development, quality of life and management of natural resources occur through participatory action between power public, the private sphere and citizens.

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<sup>16</sup> “The Internet has become a key means by which individuals can exercise their right to freedom of opinion and expression, as guaranteed by article 19 of the Universal Declaration of Human Rights and the International Covenant on Civil and Political Right”.

It is an expression that includes in its core an urban ideal that adds factors such as quality of life, communication, efficient management of services, inputs and public spaces with ways to promote sustainability, all interconnected to the world wide web (SANTIAGO; PAYÃO, 2018). In this context, Guimarães, Araújo and Costa (2020) allude that technological interference is used to create an improvement in the well-being of citizens, their inclusion and participation, environmental quality and smart development.

Examples of this technological-environmental association are the digitization of services traditionally presided over by human beings, such as the filing of complaints and the request for public services, such as the notification of holes in asphalt roads and the removal of branches from the streets, in addition to the optimization of analyzes statistics on the destination of solid waste and the extension of the green area, which are now carried out in digital media and even with data fed by the citizen himself.

Agreements with universities or even technology startups are also viable options that allow the population, via apps, to request technical visits to investigate water leaks, river pollution, irregular waste disposal, etc. The interaction between the citizen and the public power can be monitored via a digital protocol, backed by the attachment of a photograph or a video of what was stated.

In the area of mobility, technology can help by digitizing the public bus service, by providing the population with systems capable of pointing out to the user the points, line schedules, routes, car capacity, delays, among other information. . It is noteworthy that in the city of Ribeirão Preto the project has existed since 2015 and is called CittaMobi<sup>17</sup>. The city also has several other initiatives, which have made it the 10th smartest and most connected city in the state of São Paulo and the 25th in the country (PMRP, 2019).

As for health, countless benefits can be mentioned, including checking the availability of a drug at a popular pharmacy, scheduling medical appointments in the public network and accessing test results without going to a service center.

Regarding the promotion of eco-development, the contribution of ICTs and smart cities can be exemplified: (a) by controlling the proper disposal of solid waste; (b) by determining the extent of the green area, which guides environmental protection and replacement policies; (c) bringing closer contact between citizens and recycling cooperatives, optimizing collection and promoting public

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<sup>17</sup> For more information at: <http://www.ritmoribeirao.com.br/novidades/noticias/cittamobi-em-ribeirao-preto-ja-tem-642620-acessos-desde-sua-implantacao/>.

awareness<sup>18</sup>; (d) by disclosing selective collection points, electronic waste, and specific packaging and (e) by obtaining parameters for water and electricity consumption (including by citizens, who can control bath time through apps), aiming to promote the conscious use of water and energy resources. All this through free public access applications<sup>19</sup>.

Another example is brought by Molinaro and Leal (2018) when they relate the Global Forest Watch initiative, which monitors forests, identifying rates of deforestation and fires, and offering anyone in the world the same opportunity, which, for the authors, confirms that:

Technological development expands the tools that serve both to find environmental problems and to reach solutions. Such a perspective may bring greater effectiveness to the fundamental right to the environment and its determinations provided for in article 225 of the Brazilian Federal Constitution (MOLINARO; LEAL, 2018, p. 213).

For Harrison and Donnelly (2011) the implementation of smart cities produces numerous other benefits to the promotion of eco-development, such as (a) reduction in the consumption of resources, mainly energy and water, thus contributing to reductions in CO<sub>2</sub> emissions; (b) optimizing existing infrastructure capacity, thereby improving the quality of life and reducing the need for traditional construction projects; (c) availability of new services for citizens and passengers, such as real-time guidance on the best way to explore various modes of transport and travel in cities; (d) improving legal entities through the publication of real-time data on the operation of city services and (e) revealing how demands for energy, water and transport peak consumption, so that city managers can collaborate to smooth over excesses and improve environmental resilience<sup>20</sup>.

Furthermore, access to public services by the population, mediated by technology, proves to be a means of realizing the right to the city which, based on popular participation, makes it even more

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<sup>18</sup> For more information at: <https://g1.globo.com/sp/sao-paulo/noticia/2019/04/27/aplicativo-que-conecta-citadadores-a-pessoas-que-querem-se-desfazer-de-residuos-concorre-a-premio-internacional-de-us-50-mil.ghml>.

<sup>19</sup> For more information at: <https://meioinfo.eco.br/10-aplicativos-sobre-sustentabilidade/>; <https://canaltech.com.br/meio-ambiente/dia-da-terra-7-apps-para-uma-vida-sustentavel/>; <https://www.natgeo.pt/meio-ambiente/2018/10/8-apps-que-ajudam-preservar-o-meio-ambiente>.

<sup>20</sup> “*The application of information technology in Smart Cities can produce various benefits: (1) Reducing resource consumption, notably energy and water, hence contributing to reductions in CO<sub>2</sub> emissions [NYC, 2007]; (2) Improving the utilization of existing infrastructure capacity, hence improving quality of life and reducing the need for traditional construction projects [Stockholm, 2006]. (3) Making new services available to citizens and commuters, such as real-time guidance on how best to exploit multiple transportation modalities. (4) Improving commercial enterprises through the publication of real-time data on the operation of city services [Singapore, 2011]; (5) Revealing how demands for energy, water and transportation peak at a city scale so that city managers can collaborate to smooth these peaks and to improve resilience [Peterborough, 2011].*” (HARRISON; DONNELLY, 2011)

democratic, reaffirming the State's duty to protect and protect and protect the city. guarantee nothing less than a dignified and healthy life for its citizens, “which involves the task of protecting and promoting (since protection and promotion are not confused) fundamental rights, which includes the removal of possible obstacles to their realization” (SARLET; FENSTERSEIFER, p. 3).

In this sense, it can be seen that, for Morais and Saraiva (2018, p. 18) “the severity of the environmental crisis, and the consequent fragility-limitation of the legal means proposed by the State to solve it, represent, far from a conciliation between development and sustainability, a merely symbolic legal guarantee” while technology, especially the effective implementation of Smart Cities, represents a way of bringing together elements capable of raising eco-development and effecting sustainability beyond utopia.

However, obstacles are encountered. Insofar as smart cities are also based on offering equitable speed throughout the territory and connection quality consistent with the value charged by service operators, these parameters become a problem to be faced in Brazil, considering that a ranking of 68 countries that provide the best conditions for a digital life, the country obtained the 50th place when analyzing factors such as ease of contracting, value and quality of connection (INTER NATIONS, 2019).

Furthermore, the promotion of digital inclusion is one of the biggest challenges for the government in designing these smart cities, for Guimarães and Araújo (2018, p. 1799) “the provision of urban solutions based on the use of technologies is one of the fundamental components for building a Smart City, digital inclusion is a key issue for the population as a whole to benefit from the opportunities offered”.

The Survey on the Use of Information and Communication Technologies in Brazilian Households (ICT Households), promoted by the Internet Steering Committee in Brazil in 2018, with results published in 2019, revealed the dimension of digital inclusion in the country. It is estimated that, in 2008, only 18% of Brazilian households had access to the network. Ten years later, in 2018, this number increased to 70%, which represents an increase of 46.5 million new access locations, and six percentage points more than the quantum verified in 2017 (61%), if denote that, despite the progressive increase in the number of internet users, about 1/3 of the national population remains unaware of the offline reality (NIC, 2019).

Therefore, as much as modern technologies adapt to the premise of tangibility and collective scope, it is necessary that, in addition to digital inclusion, there is an effective promotion of social and cultural changes that voluntarily accompany these transformations, especially the promotion of ecodevelopment as a means of concreteness of the right to the city, since one of the characteristics

of the industrial consumer society is precisely the waste and immediacy in the satisfaction of needs (LAYRARGUES, 1997), factors that are typical of liquid modernity conceived by Bauman (2001).

With this, there is a risk that the implementation of smart cities will culminate in greater social fragmentation, further intensifying the urban inequality gap by reaffirming the preexisting unequal power relations in the city. Therefore, for the smart city to fulfill its function, a coalition with governance, democracy and local politics is necessary, in order to enable the equitable and successful development of all urban technology, including to make it effectively accessible. to all citizens (SANTIAGO; PAYÃO, 2018).

## CONCLUSION

The right to the city, in the wake of other fundamental human rights, revealed itself in the face of social conflicts based on the population's resistance to the cessation of guarantees, while its elevation to this level confirms the indispensability of its concretion in the legal system and reinforces transindividuality. as the main feature of the discussion.

In this sense, the realization of the right to the city reveals itself as an essentially collective right based on citizenship itself and on social participation and justice as indispensable pillars for the state of rights.

It so happens that it was also through the excessive increase in urban centers that a real environmental crisis was created, arising from the notorious global climate problems, but evidenced, at the municipal level, by common factors experienced in large, medium and small centers, such as (1) ) low urban mobility, (2) water supply crisis, (3) electricity rationing; (4) precariousness in housing, (5) provision of insufficient, slow and precarious public services, among others.

After all, it is not uncommon in Brazil to come across calamitous situations such as the rationing of water and electricity which, linked to landslides, landslides, residential fires, floods, among others, are the results of urban expansion without any urban planning for that.

The raising of banners such as sustainability, environmental preservation and changing habits deserves to be highlighted in this context of urbanization, considering that it does not seek to thwart growth, perhaps to prevent industrial development, but rather to enable urban centers to develop to the point where they do not degrade the environment, but, on the other hand, offer and be able to receive those who seek new opportunities, which is one of the foundations of the right to the city.

In this reality of abasement of rights, non-compliance with basic precepts and the real establishment of chaos, the increase in technology and, as a consequence, the effective



implementation of smart cities can reveal viable solutions to the realization of the right to the city and the elevation of sustainability as a foundation of municipalities, improving the citizen's experience to insert them in the context of social participation.

Technological development, mainly represented by the Knowledge Society and the revelation of ICTs as allies for the development of humanity, reveal themselves as drivers of sustainability by transmitting, in the context of smart cities, information to the community about environmental preservation and, in addition, , undoubtedly promoting eco-development itself.

Access to the immeasurable globe of information that emerges from the Knowledge Society impacts not only on the reality of those who seek improvement and technological innovation, but affects everyone, including concrete new paradigms of what is meant by quality of life and basic needs.

Therefore, we have that the promotion of technologies and their development aimed at the realization of the right to cities (and all the biases that compose it) are elevated by this new reality called the Knowledge Society, also demonstrating that through it environmental preservation and, consequently, the concretion of eco-development, can be reaffirmed by the dissemination of information and the modification of consciousness as ways to change habits, avoid and prevent environmental degradation and, thus, guarantee future generations the enjoyment of a balanced environment as foreseen. in the Federal Constitution.

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