Revista de Gestão Ambiental e Sustentabilidade – GeAS

Received: 11 Apr. 2019 / **Aproved:** 16 July 2019
Evaluation process: *Double Blind Review*
DOI: https://doi.org/10.5585/geas.v8i2.13574
e-ISSN: 2316-9834

Smart cities indicators: the emergence of a new cliché

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ABSTRACT

Study's Objective: the present bibliographic study aims to perform a critical analysis between indicators for sustainable cities (ABNT and SDG) and for smart cities (Web of Science) related to the challenges faced in cities.

Methodology/approach: The methodological procedure was a literature review on the Web of Science database, content analysis, categorization of indicators and comparison.

Originality/Relevance: The originality of the study is to analyze the set of indicators for smart and sustainable cities regarding their sensitivity in assessing a modern, innovative urban management focused on current challenges, such as migrations, climate adaptation, and natural disasters.

Main results: The authors observed recurring indicators on health, education, housing, sanitation, and poverty, as well as on innovation and technology, and the absence of indicators related to the aforementioned challenges.

Theoretical/methodological contributions: The results indicate a theoretical reference of quality and recognized by the scientific community.

Conclusion: The production of tools and technologies for use in the scope of urban issues presents a great gap in the construction of sensitive indicators in the measurement of unprecedented transformations from a climatic point of view and of great impact on the cities.

Keywords: smart cities, sustainable cities, sustainability indicators.

Cite as:
Coutinho, S. M. V., Abilio, C. C. C., Vasconcellos, M. da P., & Alvarenga, N. C. A. . (2019). Smart cities indicators: the emergence of a new cliché. *Rev. Gest. Ambient. Sustentabilidade-GeAS*, *8*(2), 386-402. https://doi.org/10.5585/geas.v8i2.13574

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Indicadores para cidades inteligentes: a emergência de um novo clichê

RESUMO

Objetivo do estudo: o presente estudo bibliográfico tem por objetivo realizar uma análise crítica entre indicadores para cidades sustentáveis (ABNT/ISO 37120:2014 e United Nations, 2017) e para cidades inteligentes (Web of Science), relacionados aos desafios enfrentados nas cidades.

Metodologia/abordagem: o procedimento metodológico foi revisão de literatura na base do Web of Science, análise de conteúdo, categorização dos indicadores e comparação.

Originalidade/Relevância: a originalidade do estudo está em olhar para o conjunto de indicadores de cidades inteligentes e sustentáveis em relação à sensibilidade destes em avaliarem uma gestão urbana atual, inovadora e voltada a desafios contemporâneos, como migrações, mudanças climáticas e desastres naturais.

Principais resultados: observamos a presença de indicadores recorrentes nos temas saúde, educação, habitação, saneamento e pobreza, além de inovação e tecnologia e a ausência de indicadores voltados aos desafios mencionados acima.

Contribuições teóricas/metodológicas: os resultados indicam referencial teórico de qualidade e reconhecido cientificamente.

Conclusão: a produção de ferramentas e tecnologias de uso na abrangência das questões urbanas apresenta uma grande lacuna na construção de indicadores sensíveis na mensuração de transformações inéditas do ponto de vista climático e de grande impacto sobre as cidades.

Palavras-chave: cidades inteligentes, cidades sustentáveis, indicadores de sustentabilidade.

Indicadores para ciudades inteligentes: la emergencia de un nuevo cliché

RESUMEN

Objeto del estudio: el presente estudio bibliográfico tiene como objetivo realizar un análisis crítico entre indicadores para ciudades sostenibles (ABNT y ODS) y ciudades inteligentes (Web of Science) relacionadas con los desafíos que enfrentan las ciudades.

Metodología/enfoque: El procedimiento metodológico fue una revisión de la literatura basada en la database Web of Science, análisis de contenido, categorización de indicadores y comparación.

Originalidad/Relevancia: La originalidad del estudio es observar el conjunto de indicadores de ciudades inteligentes y sostenibles en relación con su sensibilidad para evaluar una gestión urbana actual, innovadora y centrada en desafíos contemporáneos como la migración, el cambio climático y los desastres naturales.

Principales resultados: La presencia de indicadores recurrentes en las áreas de salud, educación, vivienda, saneamiento y pobreza, así como de innovación y tecnología, y la ausencia de indicadores que aborden los desafíos mencionados anteriormente.

Contribuiciones teóricas/metodológicas: Los resultados indican referencia teórica de calidad y científicamente reconocida.

Conclusión: La producción de herramientas y tecnologías de uso en la comprensión de problemas urbanos presenta una gran brecha en la construcción de indicadores sensibles en la medición de transformaciones sin precedentes desde el punto de vista climático y de gran impacto en las ciudades**.**

Palabras-clave: ciudades inteligentes, ciudades sostenibles, indicadores de sostenibilidad

1 Introduction

Unlike the contributions of Italo Calvino (1972), Henri Lefebvre (1969), Georg Simmel (1903), David Harvey (2012), among others, who took the city as an object for analysis on the cultural dimensions present in the urban practices, its modifications, transformations and a pulsing of its own genesis, cities, which house more than 54% of the world population, have come, from time to time, to undertake various denominations and symbolically transforming in their dynamics the possibility of new interests.

They are the healthy cities, sustainable cities, resilient cities and, more recently, smart cities, in an attempt to make it that every adjectivation allows for the possibility of new trends in the development of technologies and concepts of "urbanities" aimed at consumption in several cities and continents. The representative designs on these cities result in representations of imaginary cities, which can be erased at any time by having narratives dispossessed of urban cultural practices.

The quality of life in cities has been the subject since 1978 of the *United Nations Habitat – UN-Habitat).* The last meeting of the *United Nations Conferences on Housing and Sustainable Urban Development – Habitat III*, in 2016, in Quito, Ecuador, aimed to adopt a new urban agenda. This agenda reaffirms the commitments of urban sustainability at all levels with the participation of relevant stakeholders, contributing to achieving *Sustainable Development Goals* – SDGs and its goals, especially SDG 11, which addresses inclusive, safe, resilient and sustainable cities and human settlements. It also commits itself to the smart city approach, which uses the opportunities of digitization, connectivity, clean energy, and technology, to embrace environmentally friendlier choices, favoring economic growth and better access to services (*Habitat* III).

The concept of smart cities emerges in 2010 with the use of the term by the European Union to qualify sustainable actions and projects in the urban space (DAMERI & COCCHIA, 2013), with a view to the scenario "Europe 2020 - A strategy for smart, sustainable and inclusive growth", targeting employment, research and innovation, climate change and energy, education and the fight against poverty. As previously analyzed by a few authors, each specialized science cuts into the urban phenomenon a certain 'field' or 'domain' - its own. It sheds light on it in their own way (LEFEBVRE, 1969).

The European continent, like the rest of the world, faces the enormous challenge of electricity generation and combating climate change. It currently depends on fossil fuels for 80% of its energy and, by 2050, needs to reduce greenhouse gas emissions by 80%. This requires a complete reinvention of its energy system. For this, intelligence is especially present in the strategic objectives of the European Project *SETIS - Strategic Energy Technologies Information Systems*, to reduce greenhouse gas emissions in cities by 40% by 2020, through the use of appropriate technologies and policy measures in the fields of energy efficiency, sustainable transport, low carbon production, among others.

The idea also comes from aggressive campaigns by major technology and services multinationals, such as IBM, Microsoft, Google, Amazon, Apple, among others, since the early 2000s, in order to generate new markets for technologies and services.

In spite of the vague and utopian content of the cities' adjectivations, each one of them sought, in its time, the proposition of indicators that could measure how healthy, resilient and intelligent the cities are becoming. With the support of these narratives, national and international academic studies and norms proliferated, particularly those focused on the relationship or interaction of urban societies mediated by digital technologies.

In Brazil, several initiatives can be taken as an example, such as, since 2002, a publication on Indicators of Sustainable Development from the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística, IBGE*), which followed the initial guidance and encouragement of the United Nations Commission on Sustainable Development (Malheiros, Philippi e Coutinho, 2008); the indicators platform proposed by Rede Nossa São Paulo, Rede Social Brasileira por Cidades Justas and Instituto Ethos, within the framework of the Sustainable Cities Program, since 2010; the publication, in 2014, of the norm ABNT/ISO 37120:2014 - Sustainable Development in Communities - Indicators for City Services and Quality of Life, by the International Organization for Standardization (ISO), adopted by the

Brazilian Association of Technical Standards (ABNT), which defines and establishes a methodology for a set of indicators to guide and measure the performance of services and the quality of life of cities, and should be used with other ISO standards; as well as the set of 232 indicators to evaluate the goals and targets of sustainable development of the 3030Agenda developed by the Inter-Agency and Expert Group on SDG Indicators and adopted in 2017 by the United Nations General Assembly on Work of the Statistical Commission (United Nations, 2017).

Since then, the number of publications and research on the subject has increased, and the ISO 37122: 2019 - Sustainable development in communities - Indicators for Smart Cities was recently published, not inserted in the analysis brought by this paper.

The evaluation through Indicators for Smart Cities (ISC) gained strength in the scientific agenda and found its way in research in several countries, as the challenge, as quoted by Baum (2013, p.11), would be to develop adequate monitoring systems and practical measures that could be effectively used to verify that the goals for smart cities are being met, in an attempt to reach a consensus, trough measurable resources, of ideal city standards, as if the indicators were capable of, as a picture of this reality, mirroring the cities' complexities, be they resilient, healthy, sustainable or smart.

The intention is to explore, from a literature review, the concept of smart cities, followed by a comparative analysis between the indicator systems.

2 Theoretical Framework

There are a number of expressions for smart cities, adjectivated as intelligent cities, digital cities, ubiquitous cities, and little consensus on their definition, as there is no clear and consistent understanding of their meaning (Angelidou, 2015; Chourabi et al., 2012; Caragliu, Del Bo, & Nijkamp, 2011; Hollands, 2008; Marsal-Llacuna et al, 2015; Navarro, Ruiz e Pena, 2017).

For Angelidou (2015, p. 95) "smart cities represent a conceptual urban development model on the basis of the utilization of human, collective, and technological capital for the

development of urban agglomerations, highlighting the role of ICT to achieve prosperity, effectiveness, and competitiveness"

For Marsal-Llacuna et al, 2015, p. 617/618 "Smart Cities have evolved out of livable, creative, digital and knowledge cities, drawing heavily on the concept of the sustainable city and having in common a large technological component. A less conceptual definition would be that the Smart Cities initiative tries to improve urban performance by using information technologies (IT) to provide more efficient services to citizens, to monitor and optimize existing infrastructure, to increase collaboration amongst different economic actors and to encourage innovative business models in both the private and public sectors"

The literature highlighting the use of ICT and modern technologies as key to a smart city is extensive (IBM, s/d; Frost and Sullivan, s/d; Komninos, 2008; Angelidou, 2014; Washburn et al, 2010; Bélissent, 2010; European Commission, 2012; Chourabi et al., 2012). Another group of literature inserts, in addition to technology, the role of human and social capital in the development of smart cities for better economic, social and environmental sustainability (Navarro, Ruiz e Pena, 2017; Monzon, 2015; Giffinger et al, 2007; Hollands, 2008; Nam & Pardo, 2011; Caragliu, Del Bo, & Nijkamp, 2011; Correia e Wünstel, 2011; Lombardi, Giordano e Farouh, 2012), resulting in environmentally friendly and livable cities, encompassing the concepts of sustainability and quality of life, but with the important and significant addition of technological and informative components (Marsal-Llacuna et al., 2015; IEEE, 2014; Baum, 2013; Ahvenniemi et al, 2016).

Holding organizational and financial interest IBM (s/d, p.07) conceptualizes smart cities as "those that are driven by contributions from public and private institutions, using technology, preferably from IBM, to make cities more suitable for living, more sustainable and efficient".

To Navarro, Lopez, and Pena (2017, p.272) "This is a city that knows how to manage its intangible assets properly. The concept of the smart city goes far beyond new technologies, taking two dimensions into consideration: urban futures and the knowledge and innovation economy. The first one is closely associated with the influence of new technologies on the future development of the city, while the second includes the so-called Knowledge Management (KM) in the context of the cities – it focuses on knowledge-based-cities".

The authors conclude that there are several elements that are present in most definitions of smart cities, such as environmental issues (energy production, waste management, among others); communication between the different users (companies, collectives, institutions,

individuals); use of Information and Communication Technology (ICT) to improve network operations; social and infrastructure aspects (health services, availability of educational and cultural services), as well as efficiency in the way services are provided and controlled.

As Hollands (2008, p.315) points out, smart cities must start alongside the equation of human capital and people, rather than fully believing that technology itself is capable of transforming and improving cities (free translation). For this to happen, according to Caragliu, Del Bo and Nijkamp (2011), investments in human and social capital and traditional and modern (ICT-based) infrastructure must foster sustainable economic growth and high quality of life, in a sensible way.

The genesis of sustainability indicators dates back to the 1980s, articulating and materializing in the 1990s, during and after the Earth Summit in 1992, with the Sustainable Indicators Program of the United Nations Commission on Sustainable Development (Quiroga, 2001). Sustainable development is a complex, cross-cutting and intersectoral theme that indicates that it is difficult to measure the distance to the goals sought. The same is true of smart cities and their indicators. Nevertheless, there are a number of proposed models and sets of indicators for sustainable development in smart communities and cities.

The sustainable development indicators of communities - Indicators for urban services and quality of life (ISO 37120, 2014) apply to any city, municipality or local government that commits to measuring its performance in a comparable and verifiable manner, regardless of size and location. The indicators are structured around themes. Recognizing the differences in resources and capacities of cities around the world, the overall set of indicators for city performance was divided into “core” indicators (which must be followed by cities that adopt and implement this standard) and “support” indicators (which are recommended to be followed by cities implementing this standard).

The overall framework of indicators adopted for the Sustainable Development Agenda 2030/SDGs includes 232 indicators related and classified according to the 17 Sustainable Development objectives (Global indicator framework for the Sustainable Development Goals (SDG) and targets of the 2030 Agenda for Sustainable Development)

Both the objectives and the SDG indicators, according to recent studies (Pradhan et al, 2017; Nilsson, Grigges & Visbeck, 2016) are implicitly interdependent. However, studies show that this interaction can be conflicting if, for example, the progress of one goal impedes the progress of another; or synergistic, where one goal favors the other.

3 Method

The literature review was carried out on the Web of Science database. Web of Science and Scopus are similar databases. The first is a collection of databases maintained by Thomson Reuters, including Southampton's leading databases on biology (Biosis) and physics, electronics and computing (Inspec) databases, also spanning social science and humanities databases. The second is a large interdisciplinary database of Elsevier, with a greater focus on science and technology.

Taking into account the broader scope for social sciences and humanities, the basic search function was used in Web of Science's main database (Table 1), for articles, proceedings, and reviews.

Table 1: Keywords searched on the database on June/2017

Searched Keywords
Q1: "Smart Cit*" and "indicators"
Q2: "Smart Cit* assessment"
Q3: "Smart Cit* performance*"
Q4: "Smart Cit* information system"
Q5: "Smart Cit*" and "benchmarking"

After duplication analysis, 110 results were obtained, restricted to information on title, abstract, authorship, country and year of publication. Following this, only articles and reviews were selected for reading, totaling 46 documents. Proceedings were not considered for reading.

After reading, only 18 publications brought content on indicators, which were systematized by category and subcategories of indicators, number of indicators, the methodology used, level of study and mode of presentation of the presented results. All elements of this systematization, including categories and subcategories, were extracted from each of the articles and reviews analyzed and were therefore proposed by the authors of the publications themselves.

After this first systematization, a new categorization was proposed, with more comprehensive clusters based on content analysis of each indicator, allowing only four publications to be submitted to the comparative analysis.

These four publications were selected since, as the aim of this paper is that the denomination of smart city can be evaluated within its complexity, its authors opted to carry out a comparative analysis of broader systems of indicators due to the number of indicators and of categories.

The comparative analysis of the smart city indicators proposed in the four articles is then carried out using the sustainable city indicators of ABNT/ISO 37120:2014 and the indicators proposed by the SDGs (United Nations, 2017). The choice of these two systems is justified on account of their being internationally validated.

The indicators' categorization was carried out through content analysis of the indicators present in the four articles, resulting in the following categories: innovation, science and technology; use of natural resources and emissions; health and education; mobility; jobs; participation, governance, information; recreation; migration; safety; housing, sanitation and poverty; population profile; tourism; economy; international importance of the region.

The same was done for the sustainable cities indicators of ABNT/ISO 37120:2014 and the indicators proposed by the SDG (United Nations, 2017), resulting in the same categories, in addition to human rights; cooperation between countries; disaster and conflict; corruption; climate changes. Although situated by objective, SDG indicators sometimes repeat themselves and, for a better analysis, they have been reclassified by comparable themes

The percentage of each category was calculated based on the total number of indicators proposed in all categories.

4 Results and Analysis

The search on Web of Science's database resulted in 110 publications (Table 02).

Table 02: Keywords searched on the Web of Science database, June 2017

Searched Keywords	**Articles**	**Proceedings**	**Reviews**	
Q1: "Smart Cit" and "indicators"*	37	56	02	95
Q2: "Smart Cit assessment"*		02		02
Q3: "Smart Cit performance*"*	03	01		04
Q4: "Smart Cit information system"*		01		01

Q5: "Smart Cit" and "benchmarking"*	7	14		21
GRAND TOTAL	47	74	02	123
AFTER DUPLICATION ANALYSIS	**44**	**64**	**02**	**110**

Pattern analysis of the 110 publications in the Web of Science database shows that the publications on this subject have their peak in 2015 and 2016, with 71 publications, concentrating in Italy, Spain, and England.

The European protagonist role in this subject is justified by the €365 million-strategy to promote smart growth through a knowledge, research, and innovation-based economy; inclusive growth by expanding jobs and reducing poverty and sustainable growth, as well as by the efficient use of resources, competitive and green markets, providing a framework for the European Union to emerge strengthened from the financial and economic crisis. Innovation has been added into the 2020 Strategy for creating new jobs, innovation in products and services, as well as in dealing with climate change and energy efficiency (European Commission, 2012; Eurostat, 2017).

Predominating in the subject are the computation, engineering, and technological sciences, with 84 publications.

Result of the four most comprehensive publications submitted to comparative analysis (Table 03).

Table 03: systematization of results by category

	Indicators Category	**Nº Indicators**	**Methodology**	**Level**	**Results presentation**	**Reference**
1.	Environmental, social and cultural	60	DPSIR (*driving force*, *pressures*, *state*, *impact*, *response*) and cluster analysis	Location/ Europe	Result tables	Manitiu and Pedrini, 2016
2.	Smart economy, smart environment, smart energy and mobility, and smart governance.	18	Fuzzy Logic	Italian cities	Tables and cities radar	Lazaroiu and Roscia, 2012
3.	Smart governance. (participation); smart human capital (people); smart environment (natural resources); smart quality of life (quality of life); smart economy (competitiveness)	60	Triple helix (adapted for 4 helixes) and network analysis process.	Local	Tables	Lombardi, Giordano, & Farouh, 2012
4.	Smart economy; smart people; smart governance;	74	Cities selection standardization	Medium-sized	Maps, graphs, tables.	Giffinger, et al, 2007

	smart mobility; smart environment and smart quality of life.		and data aggregation.	European cities		

Manitu and Pedrini (2016) define a set of 60 sustainability and intelligence indicators for European cities to implement Europe 2020 strategies, by way of the *driving force, pressures, state, impact, response* – DPSIR methodology and cluster analysis in two stages.

Lazaroiu and Roscia (2012) start from the observation that cities consume 75% of world energy production and generate 80% of CO2 emissions, in order to propose a model to compute the indexes of a smart city. The so-called "smart cities" would be interconnected, sustainable, comfortable, attractive and secure. The authors present a model to define "smart cities", considering pre-chosen criteria (economy, environment, energy and mobility, governance), with different weights defined based on fuzzy logic. 18 indicators are proposed.

Lombardi, Giordano, & Farouh, (2012) analyze the relations between the smart city's components through the adapted model of a triple helix. Following this, they then use a network analysis process to model, group and measure the performance of smart cities.

The triple helix is a reference and has been modified to consider as a category, in addition to the industry, the university and the government, civil society, assuming that 4 helixes operate in the complexity of the urban environment, where civic involvement together with cultural and social capital structure the relationship between the traditional helixes - university, government, and industry. The active relationship between these actors and forces determines the success of a city for a path of smart development. This structure can be operationalized with a focus on the evaluation of the 4 helixes connected with 5 dimensions of the smart city (does not include smart mobility), resulting in smart city performance indicators.

The database comes from a literature review; statistics from the European Commission; *the European Green Index; from the TISSUE, Trends, and Indicators for monitoring the EU Thematic Strategy on Sustainable Development of Urban Environment; and from the smart cities ranking of European medium-sized cities.* There are more than 64 indicators, classified in 5 clusters. These indicators were selected in questionnaires and two focus groups with experts and professionals to select the most relevant indicators.

The study by Giffinger et al (2007) for medium-sized cities in Europe has reached a catalog of indicators based on 6 main characteristics that a smart city must have: *smart economy, smart people, smart governance, smart mobility, smart environment, and smart*

living. Each of these characteristics is determined by factors, and each factor is represented by indicators. In the end, 74 indicators are proposed for smart cities.

SMART CITIES INDICATORS

After all, what new things do they add?

The indicators aggregated by the categorization of the four publications dealing with smart cities show more emphasis on 1. Health and education; 2. Use of natural resources and emissions; 3. Innovation, science and technology and 4. Participation, governance, and information. In turn, indicators aggregated by the categorization of publications dealing with sustainable cities have a greater emphasis on 1. Use of natural resources and emissions; 2. Health and education; 3. Housing, sanitation and poverty 4. Innovation, science, and technology (Table 04).

Although the social dimension is always a priority, according to Manitu and Pedrini (2016), it is more critical in the indicators proposed for smart cities due to the possibility of exacerbating inequalities with the use of ICT.

Table 04: Comparative analysis of smart cities indicators X sustainability indicators by aggregation of results.

Smart Cities Indicators Ginffiger (2007); Lombardi, Giordano, & Farouh, (2012); Lazaroiu e Roscia (2012); Manitu e Pedrini (2016) (N= 216)		
	N	%
Health and education	43	19.9
Use of natural resources and emissions	33	15.3
Innovation, science and technology	25	11.6
Participation/governance/Information	22	10.2
Mobility	20	9.3
Jobs	16	7.4
Recreation	15	6.9
Population profile	10	4.6
Housing and poverty	9	4.2
Migration	7	3.2
Safety	6	2.8
Tourism	5	2.3
Economy	3	1.4
International importance of the region	2	0.9
	216	100

Sustainable Cities Indicators ABNT/ISO 37120:2014 and SDG (United Nations, 2017)		
	N	%
Use of natural resources and emissions	55	19.8
Health and education	45	16.2
Housing, sanitation, and poverty	33	11.9
Innovation, science and technology	22	7.9
Jobs	21	7.6
Participation/governance	19	6.8
Economy	18	6.5
Human rights	15	5.4
Cooperation between countries	13	4.7
Disaster and conflicts	11	4.0
Safety	8	2.9
Mobility	6	2.2
Recreation	2	0.7
Corruption	3	1.1
Recreation	2	0.7
Migration	2	0.7
Climate change	2	0.7
	278	100

By disaggregating the information, it is possible to visualize that a growing concern, from 2012 onwards, on the analyzed publications, probably on account of the subject of climate change in the international debate, was with the use of natural resources and gas emissions.

Innovation, science, and technology, brought as central elements of the various concepts of smart cities, do not appear in any significant way in the proposed sets of indicators (Table 05).

Table 05: Percentage Smart Cities Indicators, by publication

Indicators Categories	Smart Cities Indicators (%)			
	Ginffiger (2007)	Lombardi, Giordano, & Farouh, (2012)	Lazaroiu and Roscia (2012)	Manitu and Pedrini (2016)

Innovation, science and technology	9.5	18.8	16.7	5.0
Use of natural resources and emissions	5.4	21.9	38.9	13.3
Health and education	20.3	25.0	11.1	16.7
Mobility	12.2	3.1	11.1	11.7
Jobs	9.5	1.6	5.6	11.7
Participation/governance/Information	16.2	10.9	11.1	1.7
Recreation	6.8	10.9	5.6	3.3
Migration	4.1	0.0	0.0	6.7
Safety	4.1	0.0	0.0	5.0
Housing, sanitation and poverty	6.8	1.6	0.0	5.0
Population profile	0.0	0.0	0.0	16.7
Tourism	2.7	1.6	0.0	3.3
Economy	1.4	3.1	0.0	0.0
International importance of the region	1.4	1.6	0.0	0.0
	100	100	100	100

Although the SDG's theme is geared towards inclusive, safe, resilient and sustainable human settlements, by disaggregating data, one can observe few indicators on this thematic. In the case of sustainable cities, emerging issues such as climate change, migration, conflicts, and disasters are not even considered in the ABNT/ISO 37120:2014 indicators (Table 06).

Table 06: Percentage of Sustainable Cities Indicators by publication

Sustainable Cities Indicators (%)		
Indicators Categories	ABNT/ISO 37120:2014	SDG (United Nations, 2017)
Innovation, science and technology	4.3	8.6
Use of natural resources and emissions	17.4	20.3
Health and education	17.4	15.9
Mobility	8.7	0.9
Jobs	2.2	8.6
Participation/governance/Information	4.3	7.3
Recreation	2.2	0.4
Migration	0.0	0.9
Safety	4.3	2.6
Housing, sanitation and poverty	28.3	8.6
Disaster and conflicts	6.5	3.4
Economy	4.3	6.9
Tourism	0.0	1.3

Cooperation between countries	0.0	5.6
Corruption	0.0	1.3
Human rights	0.0	6.5
Climate change	0.0	0.9
Total	100	100

5 Conclusions/Final Considerations

In spite of the similarity of the smart and sustainable cities indicators, particularly in the items previously presented in the above tables, the emphasis to be given in the perspective of use of indicators as a basis for the evaluation of public policies, socioeconomic transformations, innovation and social inclusion are far from the discussions about adaptation of the cities to the new necessities in facing climatic emergencies, a subject that shifted greatly in priority in the past decade.

Therefore, the production of tools and technologies for use in the scope of urban issues presents a great gap in the construction of sensitive indicators in the measurement of unprecedented transformations from a climatic point of view and of great impact on the cities.

It is expected that the recent ISO 37122: 2019 - *Sustainable development in communities - Indicators for Smart Cities* will fill these gaps, bringing about indicators sensitive to current urban management, in an innovative way and geared towards climate adaptation.

Finally, this paper concludes indicating the need for a larger number of studies that avoid being identified simply as a new cliché for both the meanings of smart and sustainable.

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