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REVIEW OF PUBLIC POLICIES DEVELOPED IN THE CONTEXT OF SMART CITIES IN LATIN AMERICA, BASED ON THE GUIDELINES PROPOSED BY THE UNITED NATIONS.

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DEDICATION

I dedicate this achievement to God, who has never left me alone and has been present at every stage. To my brave, loving and magnificent mother Fernanda Durán, who has been a blessing and an example of courage and kindness throughout my life. To my wise, strong and excellent father Marcelo Peñaloza, who has always been present and has been an example of ethics and love, to my laughing and creative sister Emilia Peñaloza, as well as to one of the most important people in my life, my grandmother Antonia Illescas, who has always instilled in me to be a good person and woman. To my aunt and uncle Ximena, Marco and Juan, for their infinite love and eternal support.

I dedicate this thesis and the completion of my career to my parents Wilson Cajamarca and Esperanza Barrera, who have been the people who have always supported me throughout my life instilling values which helped me to shape my personality to be a good person, I also want to thank my brother Pablo because despite our fights we have always supported each other unconditionally since we were little; I also hope with all my heart that my grandparents Manuel Barrera and Blanca Narea, who were there for me from the day I was born and until the day they died, are proud of me for everything I have achieved, because despite having lost them at an early age, they were always a fundamental pillar in my life and those who taught me to be strong despite all the difficulties; finally I want to thank God for always accompanying me and giving me wisdom in my decisions and the Virgin Mary for guiding my life and guarding me from all the dangers that surround me.

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Resumen:

La aparición y el desarrollo de las Tecnologías de la Información y Comunicación han posibilitado la implementación, estructuración y adaptación de la tecnología en actividades estatales alrededor del mundo con el fin de generar eficiencia y aumentar la productividad de la población, buscando promover la innovación y el desarrollo sostenible. La presente revisión sistemática de literatura recopila diversos artículos que detallan la implementación de la tecnología en ciudades latinoamericanas, los cuales han buscado estructurar urbes que usen la tecnología como uno de sus pilares fundamentales de administración y gestión. Además, se han identificado políticas públicas que cumplen con los lineamientos para ciudades inteligentes propuestos por las Naciones Unidas; gracias a la ejecución de iniciativas inteligentes dentro de las urbes se evidencia la creación de ciudades y comunidades sostenibles.

Palabras clave: gobernanza electrónica, gobierno electrónico, industrialización, participaciónelectrónica, sostenibilidad

Abstract:

The emergence and development of Information and Communication Technologies have enabled the implementation, structuring and adaptation of technology in state activities around the world inorder to generate efficiency and increase the productivity of the population, seeking to promote innovation and sustainable development. This systematic literature review compiles several articles detailing the implementation of technology in Latin American cities, which have sought tostructure cities that use technology as one of their fundamental pillars of administration and management. In addition, public policies have been identified that comply with the guidelines for smart cities proposed by the United Nations; thanks to the implementation of smart initiatives within cities, the creation of sustainable cities and communities is evident.

Keywords: e-governance, e-government, e-participation, industrialization, sustainability

REVIEW OF PUBLIC POLICIES DEVELOPED IN THE CONTEXT OF SMART CITIES IN LATIN AMERICA, BASED ON THE GUIDELINES PROPOSED BY THE UNITED NATIONS.

1. Introduction

Currently, states have encouraged the implementation of technology in all its forms in diverse areas such as communication, politics, health, commerce, education, governance, etc. According to a United Nations forecast, by 2030, one in three people in the world will live in cities with at least half a million inhabitants. Therefore, enabling smarter and more resilient cities is one of the key objectives to address global challenges and ensure the well-being of citizens in the coming years (Ramirez, 2021). The guidelines proposed by the United Nations have regulated the use of these technologies through policies that propose, promote, and guarantee sustainable development as the main axis for the development of a population based on productivity, innovation, security, and intercommunication in an intergenerational manner.

In September 2015, in New York, United States, the United Nations Summit on Sustainable Development took place, where evident and constant damage to the environment and its inhabitants was evidenced. This damage made known the extreme consumerism that the world population had caused over the years, resulting in the exploitation of natural resources that did not supply the constant and growing demand of the world population. It is for this reason that it is proposed to regulate the use of these technologies around the world so that they are used in a sustainable and effective way. It is necessary to embrace the importance of population awareness about environmental damage because, according to Arndt (1958), as cited in Travis (2017), the human condition is centered on the way human beings inhabit and act in the built and natural environment. To collaborate with this work, there has been the emergence of the Sustainable Development Goals, which encompass seventeen different objectives that seek to mitigate damage to the environment and ensure a good quality of life for people.

According to De Guimaraes et al. (2020), smart cities affect access to urban opportunities and therefore have the ability to drive the Sustainable Urban Development Agenda. Also, according to Furtado, the New Urban Agenda established by the United Nations in 2017 stresses the importance of information and communication technologies, so that constant innovation of them is able to offer agile, effective, efficient, and sustainable solutions, so that in this way, smart cities can reach the Sustainable Development Goals. (2018)

Smart initiatives have spread all over the world, and with the aim of providing welfare and improving the quality of life of citizens, the same is used to support cities with their sustainable projects (Ivars-Bidal et al., 2021). Furtado (2018) posits that smart initiatives ensure the sustainable management of natural resources by providing citizens with equal opportunities and promoting access to basic services such as water and sanitation. The Sustainable Development Goals represent goals that should be prioritized in conjunction with the balanced progress of social, economic, and environmental sustainability, since according to Evans (2009), the smart city will be an authentic, tolerant, and livable city, associated with a creative population and a knowledge economy based on economic prosperity, respect for the environment, and concern for society.

The present research will focus on goal eleven of the Agenda 2030 Sustainable Development Goals, "Sustainable Cities and Communities". It will analyze the implementation of public policies for the structuring of smart cities based on the guidelines of the United Nations in the countries that make up Latin America. Cases will be presented in which the technological implementation has stood out globally for its commitment and management as smart projects and initiatives, which have resulted over the years in the implementation and maintenance of significant progress in the structuring of a smart city.

2. Objetives

Develop a systematic literature review that identifies the state of the art of public policies implemented by Latin American countries in the context of smart cities, as proposed by the United Nations.

Identify the theoretical framework of smart cities proposed by the United Nations, with emphasis on the public policy development approach and its scope.

Conduct a systematic literature review under the guidelines of Kitchenham and Charters that evidences the development of public policies implemented in Latin America for smart cities.

3. Theoretical Frame

The following is a systematic literature review on smart cities, which, according to the United Nations (2016), are defined as "those that use technology as a tool to optimize the efficiency of the city and its economy, as long as it serves to improve the quality of life of citizens and protect nature". These cities have as their main characteristic, according to Erazo (2016), "the intensive use of Information and Communication Technologies (ICT) as a facilitating force" (p.60).

It is estimated that by 2050, 70% of the world's population will live in cities; 64.1% of people will do so in developing countries and 85.9% in developed countries (Department of Economic and Social Affairs, 2016). The term smart city usually refers to the use of technology by the public sector, typically to measure urban activity and urban change. Sensors that measure the amount of traffic on the street or the amount of waste in a dumpster are particularly common forms of smart city technology. (Glaeser et al., 2021).

The main challenges of a smart city project are economic development, social inclusion, security, sustainability, infrastructure, transportation, and housing. New information and communication technologies enabled the democratization of the capacity for inclusion of citizens, who became empowered to participate in the innovation dynamics of their cities (Capdevila and Zarlenga, 2015). The smart city must have "a strong governance-oriented approach that emphasizes the role of social capital and relationships in urban development" (Albino et al., 2015, p. 4). Because technologies allow supporting the search for more information about the demand and potential supply of citizens, it benefits governance and private entities by being able to provide preference data to locate a new venture where the occupants want it. It also provides valuable information through applications such as transportation navigation, emergency response, and other location-based services. It also stimulates social participation and can be used for visualization, analysis, and monitoring of the urban environment in order to infer sustainability goals (Souza and Bueno 2022).

3.1 Dimensions of Smart Cities

A city to be recognized as smart, must encompass the following six existing dimensions:

The social dimension is based on improving communication between citizens and encouraging active participation in the design of cities through dissemination, thus communicating the problems and decisions to be made regarding the management of the city. Thus, the real needs will be known, and inclusion and democracy will be urged. (Castro, 2017)

The administrative dimension proposes to leave aside the traditional management of a city and apply a digital management in order that the problems are solved effectively. Also, for the facilitation of services and data exchange, it is committed to intelligent governance. (Castro, 2017)

The economic dimension will focus on steady economic growth, generate innovation, and stimulate the market both nationally and internationally, seeking to improve the productivity of the city. (Castro, 2017)

The legal dimension focuses on the drafting of public policies that aim at the implementation and management of smart cities, driving growth and development. (Castro, 2017)

The technological dimension is the main area of a smart city; therefore, human capital must be trained according to the needs of the urban model. (Castro, 2017).

The sustainability dimension wishes to generate balance and respond to the challenges implied by the objectives of a smart city in the economic, environmental, and social spheres (Castro, 2017).

3.2 Sustainability, Population and Smart Cities

A city is smart when aspects such as human and social capital, in conjunction with communication infrastructures (ICT), support economic growth, welfare, and boost the quality of life of the population in a city. It must also have good management of natural resources and participatory governance (Caragliu et al., 2009). When combined with transport and telecommunications infrastructure, these cities become smart cities and generate sustainable and steady economic development. (Caragliu et al., 2011, as cited in Cerutti, 2019) In this context, the notion of "Smart Cities" is becoming increasingly relevant due to the processes

associated with the evolution of globalization, which expect governments to provide services that improve the quality of life of their inhabitants. (Giffinger et al., 2007).

Well-being and quality of life are two key elements of smart city development; these are known as continuous processes whose measurement is determined by citizen institutions, social norms, and the cultural context of cities (Scott, 2012; Astleithner et al., 2004). It is important to add that the development of urban innovation is modified by these notions of well-being and quality of life due to how citizens decide to adopt and develop smart projects and initiatives.

According to Leite and Ingstrup (2022), institutional logic research with respect to smart projects contributes in three ways: first, it identifies the different strategies that individuals use as a mode of interaction, thus achieving concatenation of strategies, individuals, and their utility over time; second, it provides balance between the objectives of an organization and the personal objectives of an individual, which facilitates the dynamism of smart initiatives; and finally, individuals in a city streamline the harmony and convergence of smart motivation in institutions.

3.3 United Nations and the International Telecommunication Union in Smart Cities, Guidelines and Implementation

The ITU, founded in 1865, is a specialized agency of the United Nations that is responsible for facilitating international connectivity of communication networks as well as developing technical standards to ensure the harmonious interconnection of networks and technologies (International Telecommunication Union, 2022). Both the United Nations and the ITU have been responsible for establishing standards applicable in all countries of the world for the technological development of cities; especially in Latin America, technological growth and development have been notorious, taking into account that it is made up of developing countries.

As already mentioned, the role that ICTs play in a city is undeniable, since they "have marked a significant and irrevocable beginning of changes in the ways in which people live, increased social prosperity, and have had a significant impact on the growth and competitiveness of economies and cities". (United Nations Conference on Housing and Sustainable Urban Development, 2015, p. 3)

Therefore, challenges have been imposed on national and local governments of emerging countries associated with the formulation and implementation of smart city policies and plans that must be supported by a conceptual framework and a structured theoretical model so that the progress in global smart city rankings can be compared based on the results obtained and their coherence with local reality. (Camargo Salas, F., Montenegro, C., & González, R., 2022).

3.4 Background

According to Vanolo (2014), as cited in Ivars-Baidal et al. 2023), Spain is a reference country for smart initiatives in which plans and projects have benefited due to European Union policies. Smart proposals that were initially applied in urban areas have reached tourist destinations and have influenced the planning of cities and tourist areas. According to Engelbert et al. (2019, as cited in Ivars-Bidar et al. (2023), smart projects and planning have been promoted and stimulated by public incentive programs in three domains: territorial-urban, technological, and tourism policy. Most of them depend on external public funding from the European Union. On the other hand, Latin American countries have experimented with different formats of smart city policies in recent years. However, these experiences have reflected the "worldly aspirations" of urban elites, with the exception of a few specific cases. Hence, inequality is central to Latin American smart cities, given that most interventions are located in or benefit higher-income areas and actors, making it a controversial issue within these countries (Mendes, 2022, p. 272).

It is important to mention the actors that integrate the smart city, their objectives, and their scope within the city. While the objective of public managers is to reduce costs, citizens expect a safer life or spend less time in traffic jams (Meijer and Bolivar, 2016, as cited in Leite, 2022). In any advancement and development initiative that creates value for citizens and governments, the company or group of companies that created the project will be remunerated more handsomely than those companies that are only outstanding at an incremental level (Leite, 2022). Smart city initiatives that present opportunities close to or within the company's current knowledge domain, such as smart city solutions applied to an existing urban system, are known as incremental innovation (exploitative type) (Nonaka, 1994, as cited in Leite, 2022); on the contrary, according to Nilssen (2019), smart city initiatives that encourage citizen participation in the

innovation process have a radical scope (exploratory type). Opportunities that are cognitively distant (with potentially more reward) are those that require the firm to act and explore knowledge beyond its intellectual domain (Gupta, Smith, and Shalley, 2006, as cited in Leite, 2022) and therefore have a radical character.

In 2020, according to the Smart Cities Council (2016), 40 cities will be considered smart cities, and in 2025, that number will increase to 88. Among them, Rio de Janeiro and Curitiba, in Brazil, are considered the two smartest cities in Latin America.

3.5 Smart Cities in Latin America
Despite these practical cases of smart city implementation and the effort that Latin American countries have made to begin research and adapt this technology to daily life, the issue of smart governance is still in its infancy. On the other hand, within the economy and politics, it has been sought to promote green industrialization due to the fact that green economy is considered government technology (Dunlap, 2023). Low carbon emissions and data privacy are green initiatives that contribute to and promote sustainable smart projects; however, the areas explored are still few; such is the case that in Brazil, special attention has been given to the research of urban climate governance and the different tools for the implementation of smart cities.

3.5.1 Rio de Janeiro-Brazil
According to Mendes (2022), in the Brazilian strategy for digital transformation, the country plans to invest in IoT applications for the improvement of urban mobility, the efficient use of security, energy, and supply systems, and other solutions aimed at social and environmental sustainability in densely populated urban centers. In addition to the Regional Center of Studies for the Development of the Information Society (Cetic.br), which is part of the Internet Management Committee, and the Center for Management and Strategic Studies (CGEE), linked to the Ministry of Science, Technology, and Innovation (MCTI), there are also research networks on digital surveillance, such as the Latin American Network of Studies on Surveillance, Technology, and Society (Lavits) (Mendes, 2022, p. 275).

In Mendes´ words (2022) a relevant antecedent of smart city implementation is attributed to the city of Rio de Janeiro in Brazil, specifically in the year 2009 as the city consolidated as host of the 2016 Summer Olympic Games, Eduardo Paes who figured as mayor of Rio de Janeiro from 2009 to 2016, adopted several strategies in Rio to transform it into a smart city, this was heralded as ideal for promoting climate action, improving the quality of life of the population and increasing labor and economic productivity through outsourcing and temporary employee contracts, the use of meritocracy and bonuses in the pay of public servants, in addition, continuing education was promoted as a key instrument for productivity (p. 275).

In Rio de Janeiro, Brazil, the Rio Operations Center (COR) was created in 2010 to control and monitor the city 24 hours a day with more than 500 cameras and various sensors installed in the urban environment, helping in the management of urban mobility, violence mitigation, rainfall forecasting, and its relationship with the occurrence of socio-environmental disasters (Scremin & Rossi, 2016, p. 1605).

3.5.2 Curitiba-Brazil
According to Macke et al. (2018), the city of Curitiba in Brazil has received about 31 awards for its smart living initiatives. The Brazilian credit certification agency "Austin Rating" and the news magazine "Revista ISTOÉ" awarded Curitiba the Best City in Brazil, Best Large City, and Best City in the Labor Market category. According to the Curitiba local government (2016; IPPUC, 2017), the study prior to granting the award analyzed around five thousand five hundred Brazilian municipalities with indicators related to social, economic, physical, and digital areas, with a focus on equal opportunities for all inhabitants.

Curitiba has had a recognized trajectory in the dissemination and application of technologies in its planning and management processes since the 1950s, when the municipal public administration began to use electrical equipment to mechanize the tasks of municipal officials (Pereira and Prokopiuk, 2022).

This city is considered a reference as it has contributed and continues to contribute to emerging and transitional concepts such as smart cities (Carvalho et al., 2012, as cited in Macke et al., 2018). According to UN Habit (2016), it is a reference for projects and initiatives characterized by innovation and streamlining of processes. In 2010, it was the first city in the world to connect public buses to a 3G mobile broadband network. This innovative project provided new services to the traveler, such as route planning and the purchase of tickets whenever and wherever the individual wished.

Therefore, Curitiba is an example of good urban planning practices through investments in BTR (Bus Rapid Transit) and the creation of green corridors (Cervero and Dai, 2014). Macke et al., now that this Brazilian city has also proposed the separation of waste into dry, wet, and solid recyclable materials and developed projects that encourage recycling in low-income areas. (2018)

Curitiba's commitment to accessibility, transparency, social justice, poverty reduction, and efficient resource management has ensured the well-being and quality of life of its citizens and propelled the city to remarkable achievements in planning and sustainable development.

3.5.3 Campo Grande- Brazil

In search of means and alternatives to provide high-quality services with availability and accessibility for all Brazilian citizens, the city of Campo Grande in Brazil created the Reviva Centro project in 2019, considered a pilot project, in order to operate with a series of structural interventions in the city center. The pilot project had the support of the Inter-American Development Bank (IDB), a partnership established through the "pact together for Campo Grande" project, in addition to having the support of universities, entrepreneurs, and civil society. (Sant'Ana, 2021)

It is worth highlighting the area of connectivity. According to the teste de velocidade mais confiável do Brasil (internet broadband meter, SIMET, 2018), in the city of Campo Grande, the region with the best internet is the central one, mainly around "Shopping Campo Grande," so it is inferred that high-quality internet is reserved for the most affluent regions of the city.

This indicates that the supply of internet providers is directed to specific locations in the urban area of Campo Grande, which accentuates the social exclusion that exists in Brazil (Sant' Ana, 2021). Sant' Ana assures that despite this inequality, there are initiatives to minimize this situation of exclusion. For example, the public administration of Campo Grande created a program called Conecta Campo Grande, which allows the population to access the internet through the city's Wi-Fi network via smartphone, tablet, or laptop. This initiative aims to provide low-income people with access to the internet. (2021)

According to Souza and Clajus (2017), through a partnership with an internet and television company, the municipal city administration is expanding internet access to the city's schools. This initiative, while it can help with the digital inclusion of the population, can also be used as an essential resource in the training of teachers for the use of new information technologies.

3.5.4 Buzios – Brazil

In 2011, "Enel Brasil Holding, Ampla Energia e Serviços S.A." launched a project with the purpose of turning Buzios, a Brazilian city, into the first smart city in Latin America, with the purpose of making the project known to tourists and generating income for the city; in order to realize it, the help of 40 professionals was obtained both to determine the tourist destination, implement a smart infrastructure, create applications for tourism, and invest in the creation of smart destinations (Calvheiro et al., 2021, p. 12).

Another project carried out to boost innovation is the CIB (CIDADE INTELIGENTE BZIOS), which was carried out between November 2011 and October 2016 and cost more than US$20 million. For this, it was necessary to study the city, its population, the activities and places they offer, and the quality of life of its citizens in order to turn Buzios into a smart city, thus implementing technology in all areas of daily life (Brando and Joia, 2018).

3.5.5 Santiago de Chile y Temuco- Chile

In the energy sector, Chile is one of the countries with the least innovation, thus contributing to environmental degradation. This is generated by factors such as industrial monopolization, resistant policies, immature markets, etc., resulting in the struggle of citizens in the years 2010 to 2014 to stop the construction of a coal-fired thermoelectric power plant that had been approved by the Ministry of Environment. These events were accompanied by a cycle of protests called Citizen Awakening 2011. (Baigorrotegui, 2019)

How long will I be late? The project, implemented in the city of Santiago de Chile, employed the use of digital applications based on user interaction for transit management, trip planning, and shared mobility (Scremin & Rossi, 2016, p. 1606).

On the other hand, the Smart-up Chile program was created in 2010 to attract innovative start-ups from abroad, offering foreign entrepreneurs a residency visa and a non-refundable grant to develop their projects. a residency visa and a non-refundable grant to develop their projects. In addition to the grant, selected start-ups receive mentoring, office space, and access to social and capital networks in the country. The goal of the program is to turn Chile into the innovation and entrepreneurship hub of Latin America, attracting the best and brightest entrepreneurs in the world to develop their start-ups in Chile. (Guimón et al., 2018)

In Temuco, Chile, they worked with regional transportation authorities, other governmental stakeholders, and citizens to create a more socially just and sustainable transportation plan. Significant participants included regional transport staff and neighborhood associations from mainly low-income neighborhoods, which are rarely involved in official processes. These meetings focused on participatory mapping, the creation of a citizens' roundtable, and a roundtable of institutional actors, with joint meetings between the two (Sagaris, 2018).

3.5.6 Cuenca-Ecuador

Research conducted in 2021 presented a scenario for a 100% renewable energy system for the city of Cuenca in Ecuador. This study consists of a projection until the year 2050. According to Icaza et al., in order to initiate the transition from a traditional urban model to an intelligent one, a central change in the productive matrix of Ecuador is necessary, together with legal reforms and business strategies. In this way, it is possible to stop using fossil fuels through the implementation of new renewable energies. (2021).

Currently, Cuenca already uses renewable energy in its smart projects. According to Icaza et al., the proposed scenario for 2050 is based on three primary sources of renewable energy: hydro, solar, and wind energy. Globally, it is proposed under the concept of smart energy, which dynamizes the electricity sector mainly through the integration of all technological sectors. To avoid electricity shortages, such as the one that occurred continuously between 1992 and 2007, the Ecuadorian government launched a program called "Change in the Energy Matrix", with a series of large-scale renewable energy projects in 2021.

Changes in legal regulations have allowed the construction of electric power generation plants. With the change in the national productive matrix, the implementation of electric vehicles and the switch from natural gas to electric stoves were possible. A clear example is the "4 Roses" tramway that crosses the city from north to south and vice versa. It should be noted that the tramway incorporates 100% renewable energy generation, which provides heat in urban and marginal urban areas (Icaza et al., 2021).

3.5.7 Smart Initiatives for Smart Cities in Latin America

Mexico City in Mexico took a new approach by implementing education programs supported with technology, considering measures for the formation of human capital with digital skills, digital inclusion and the promotion of digital culture (Scremin & Rossi, 2016, p. 1605). Likewise, in Mexico, digital government has been promoted and has evolved as the years go by; therefore, to evaluate each of these portals in the thirty-one states of Mexico, specific websites have been used since 2004 in order for each state to have a structured service that adapts to different needs (Puron et al., 2022).

In terms of connectivity, the City of Buenos Aires is the Argentine locality with the highest penetration of fixed Internet access, reaching a connectivity index of 108 accesses per 100 households and an average download speed of 73 Mbps (Cabello et al., 2022). (Cabello, 2022) To prevent risks of collisions or accidents, automatic learning techniques were also developed using a database and provided to the countries, thus identifying high-risk areas and the time of the accident. Together, this facility has been linked to cell phones since, if there is a risk of an earthquake or tremor, it sends a notification seconds before the event looking for the person who is ready and safe. (Paredes et al., 2022)

Santa Cruz de la Sierra, in the Plurinational State of Bolivia, is one of the fastest growing cities in the world. Although the city has the highest drinking water coverage in the country, current groundwater resources have deteriorated in quality, and water availability for both population and agriculture is increasingly uncertain; therefore, reforestation has been devised as an option to alleviate the city's water stress by creating aerial rivers and selecting specific areas for planting (Weng et al., 2019).

According to Zuiderwijk, the implementation of smart initiatives based purely on technology provides potential benefits to government administration in several areas, such as improvements in performance and efficiency, risk identification and monitoring benefits, economic productivity, benefits for data and information processing, benefits for society in general, decision-making, increased interaction, and ongoing sustainability (2021). The improvement of the administrative area in several countries has had a great impact on the advancement of the socio-economy by implementing Colombia's strategy for the improvement of this area, which is made up of five processes, including e-information, e-interaction, e-transaction, e-transformation, and e-democracy. This was raised in 2008 and reinforced in 2009. (Gomis, 2017) It is inferred from what was established by Gomis that the e-government existing in Colombia since 2016, thanks to the public-private partnership that is part of the national strategy for the use of big data, has strengthened over the years the institutional strengthening to a level that allowed Colombia, after almost 50 years of conflict, to respond to the existing armed groups, resulting in the consolidation of security and governance.

3.6 Climate Change and Smart Initiatives

Regarding climate change mitigation, this should include energy efficiency, low-carbon and carbon-free technologies, carbon reduction technologies and carbon capture and storage technologies; these include geoengineering, which aims to reduce global warming by modifying the climate, involving reflective particles in the atmosphere, carbon capture and storage in the soil or the construction of giant mirrors in space to deflect the sun's rays (Matos et al... 2022), 2022), this is key to improving the quality of life of citizens within a city because according to Soberón, the transition towards sustainability recognizes the importance of green initiatives also known as ecological, arguing that they are relevant because they are a means of intermediation as a method of accelerating these transitions towards sustainability, sustainability and governance (2022). The improvements made in this area have influenced the implementation of these initiatives by government agencies and their adoption by citizens, businesses, and other important users. (Gil and Flores, 2020)

As is well known, the concept of a smart city originated under the precepts of urban sustainability, although the term sustainable city has been given relevance. Within this, there are two streams of research in relation to sustainable ICTs: greening in ICTs and greening through ICTs. Greening ICT means that this sector has become a driver of environmental pollution at all stages of the product life cycle and is becoming a major consumer of electricity globally with increasing emissions, so there is an urgent need to make ICT goods and services more sustainable throughout the production-consumption-disposal cycle. "Greening through ICT" is about fostering transitions to sustainability through digital technologies. (Mendes, 2022).

On the other hand, Mendes (2022) indicates that the climate crisis has increased as a result of contemporary capitalism generated mainly by companies; therefore, it is necessary to develop new policies and intelligent systems to control and mitigate the damage to ecosystems. Especially in countries belonging to the global south, such as those that make up Latin America, where climate injustice occurs to a large extent due to the limited resources and capabilities to cope with these changes,

With the drive for urbanization in the different Latin American countries, it has reached a point where this process is the very process that generates pollution, so it is argued that ICTs can help cities reduce emissions, especially in the mobility and energy sectors. In addition, it is noted that they could support more participatory climate action. However, municipal budgets for smart cities are limited, and the adoption of smart technologies is still experimental. (Adnan et al., 2022).

Given the case, the implementation of technology at the international level that companies have exercised represents great influence in fostering and managing smart cities, such as the IBM Challenge, developed between 2010 and 2017; performance ratings or indicator systems have also played an important role, as well as international standards for smart cities promoted by the International Organization for Standardization, the International Electrotechnical Commission or the International Telecommunication Union; from this perspective, the priority of smart city development shifts from technology to smart urban governance, which integrates technology, human capital and collaborative governance. (Mendes, 2022)

3.7 Mobility and Smart Cities

The concept of smart mobility (transport and ICT) consists of four factors. While sustainable, innovative, and safe transport systems are the most important factor and should be prioritized in order of importance, they are followed by the availability of infrastructure as the last priority factor (Ozkaya & Erdin, 2020). It

is of utmost importance to take into account that there are mechanisms that transform processes and turn them into sustainable and sustainable initiatives, which greatly contribute to cities transforming them into smart cities. According to de León Barido (2018), sensor networks, information technologies, communication, and advances in behavioral science can enable the design and implementation of inclusive automation information systems for ongoing low-carbon transitions. This set of networks makes environmental protection and preservation possible.

According to the European Union (2013), the smart mobility pillar should increase sustainability and be as inclusive and healthy as possible. Among the dimensions of smart mobility are a sustainable public transport system that is energy efficient and affordable, easy access to all parts of the city, and favorable conditions to move quietly in and around any area.

With respect to mobility in a city, one of the biggest obstacles is traffic and the increasing number of cars used to move from one place to another. According to the Inter-American Development Bank (2021), traffic congestion is not only associated with the value of time lost during rush hour or excessive fuel consumption with the irregularity of speed at the time of the traffic jam; congestion and vehicular traffic are directly related to fatigue, depression, and anxiety, leading to increasing rates of traffic accidents, which completely diminish the quality of life of the city in question and hinder the implementation of sustainable development in cities. (Fulponi, 2023, p. 22). Road congestion becomes a serious problem not only for citizens but also for delivery and transport companies, couriers, and policymakers. (Puente-Mejia et al., 2018).

In relation to public transportation, it is known that public services should aim to maximize the utility of citizens, which is why the management of public transportation is difficult, but the lack of it is even worse, which can translate into problems of access to life in society, education, health, and economic opportunities. Due to this, cities have implemented different types of transportation to meet needs, whether metro, bus, train, streetcar, etc. (Wernecke et al., 2021).

Vehicular congestion has increased in developed and developing countries due to the intensive use of automobiles, which in Latin America has increased exponentially. This congestion results in additional transportation costs, damage to the environment, and a threat to quality of life, concluding that this problem is a matter of interest for public policy and planning. (Fulponi, 2023, p. 22).

According to Fulponi (2023), the cost of traffic congestion on the lives of citizens reaches per year the equivalent of one monthly salary on average per capita. This is considered a socioeconomic loss that should be taken into account for the elaboration of public policies since in a large number of cities there is a perception that by implementing road infrastructure projects the problem of congestion is mitigated, which produces induced demand; by expanding roads with the construction of infrastructure and reducing waiting and travel time, the cost for citizens is reduced in time perception, which produces the appearance of new consumers.

On the subject of public policies, the concepts of transfer policies, diffusion policies, learning policies, and mobility policies have been used, all of which have been applied to the creation of smart cities by integrating each area according to the function needed to develop the technological implementation (Cárdenas and Wladimir, 2019).

One of the public policy alternatives that have been implemented in some cities is modal segmentation, or the type of vehicles circulating on the road (Fulponi, 2023, p. 26). In addition, Fulponi (2023) states that traffic planning policies are necessary to reduce congestion; these are strategies for road design that promote attentive and responsible driving. Designing traffic-calming policies forces drivers to pay attention to their overall driving environment to determine their driving behavior. Factors such as road conditions, obstructions, sight distance, and the presence of pedestrians can severely affect road safety. In this way, traffic-calming policies serve a dual function: improving road safety while reducing vehicle volume. If the vehicle volume is reduced, there is less chance of bottleneck congestion, and the standard deviation of speed is minimized. It should be noted that this policy can be implemented on medium-flow avenues or streets, not on highways or major roads. In addition to these measures, certain lanes may be allocated for the exclusive circulation of cars carrying more than one-person, prioritizing vehicles that have the greatest potential for productivity loss when carrying multiple people rather than a single trip (p. 26).

3.8 Renewable Energy in Smart Cities

The energy sector is recognized as an important edge for smart cities; its budget in different countries is higher than other areas and thanks to this, there is the emergence of renewable energies in conjunction with multinationals, funding sources, acquired knowledge and experience of companies, government agencies or NGO's (Dall et al. 2022).

According to the Renewable Energy Policy Network for the 21st Century, (2017), the current global transition to renewables is occurring in all regions around the world for all levels of human development and their respective incomes. Notably, most of the new renewable energy capacity is centered in low, lower middle-, and middle-income countries. Regarding one of the most important edges in a smart city, Adnan et al. (2022) mentions that, the early 1990s were the basis for the announcement of e-government initiatives, which produced phase 1.0, which is the first generation of e-government that seeks to provide the government with information and facilitate transactions in the public sector. (p. 3)

3.9 Intelligent Governance

Smart governance is crucial to sustainable development as, according to the European Investment Bank Institute (2017), it "makes use of available technology to learn about and coordinate with activities carried out by other municipalities, achieve synergies through collaborations with other stakeholders, and reach out to citizens' needs in order to improve both public services and trust in public institutions." (p.5). According to Ozkaya & Erdin (2020), the concept of smart governance is characterized by three relevant factors: transparent governance, participation in decision-making, and finally the factor of public and social services.

An important practice of "Smart Government" is the so-called "e-government, or digital government, which seeks the digital delivery of public services and improves the interface with citizens through digital channels (Castells, 2009; WBG, World Bank Group, 2015). As such, e-government is central to the so-called digital transformation, through which governments use ICT to create new automated public services that bring benefits to the daily lives of society (Martin, 2008; Pereira et al., 2018).

The key concepts related to smart government are: integration, innovation, information sharing, evidence-based, citizen-centered, sustainability, creativity, effectiveness, efficiency, equality, entrepreneurship, citizen participation, openness, resilience, and technology literacy (Pereira et al., 2018; Gil-Garca et al., 2016).

In order to properly manage countries, it has been resolved to create policies for smart governance seeking to work together with citizens for decision-making; an example of this would be climate-conscious urban policies and citizen participation in these activities. Such is the case with creating climate awareness that the various smart cities have adapted their technologies to address the management of areas effectively and based on specialized research. (Martnez and Luján, 2019)

The present one was based on preliminary studies defining and explaining the concept of "e-government", electronic government," or smart governance," which according to Gibson et al. (2014) (as cited in Adnan et al. 2022) is the result of globalization and technological advances and was created as an initiative due to the lack of citizen interaction, distrust in institutions, and dissatisfaction with government performance. The participatory processes of society and technological innovation are the main axis of stakeholders with respect to the digital era that promotes a creative citizenship.

According to Adnan et al. (2022), with the passage of time, government institutions have modified their way of communicating and sharing content among themselves; likewise, the interaction and collaboration with citizens have been transformed by the innovation of new and existing systems in e-government. These are vital means to streamline the work of government and the relationships between individuals and organizations that facilitate cooperation.

Almarabeh et al. (2010), as cited in Adnan et al. (2022), define a precedent in the 1990s where the participation of former U.S. Vice President Al Gore stands out, who in 1993 proposed e-government as a method of interaction between citizens and government agencies, which benefit from the services provided by e-government.

Currently, governments adopt the e-government model by adapting information and communication technologies (ICT) when providing services to businesses, citizens, and governmental and non-governmental entities (Alzharani et al., 2017, as cited in Adnan et al., 2022). Digital transformation goes hand in hand with "Smart Governance", according to Mergel et al. (2018). Through ICT, public officials use digital areas to get to know electoral candidates, communicate better with them, and create together more legitimate, lawful, and dynamic services.

Regarding the necessary competencies guided by the implementation of e-government, the Open Data Institute (ODI) has developed a framework that includes six sets of core competencies: introduction, publication, management, business, analysis, and leadership (Gascó, 2018).

3.10 Electronic Citizen Participation
Citizen participation is crucial for the implementation, development, and growth of smart cities, which bring positive benefits and results. In this research, the term e-participation, according to Macintosh (2004), consists of three components: electronic information, electronic consultation, and electronic decision-making. Participation is promoted through external actors; according to Bayuo, governments, NGOs, and regional development blocks promote social innovation as a matter of teaching and education (2020).

The United Nations (2018) further defines e-participation as "providing citizens with more electronic information for decision-making, promoting e-consultation for participatory and deliberative processes, and strengthening e-decision-making by enhancing citizen input."

It is important to highlight the relevance of public actors in the city, as according to Jia et al., the transportation office and the offices in charge of environmental protection and preservation are responsible for formulating the implementation measures of the Restriction Policy, publicizing and organizing the policies to citizens through traditional media and social media, and increasing public awareness and participation in the policies (2020). This promotes and ensures citizen participation, sustainability, and quality of life.

The Organization for Economic Cooperation and Development (OECD) defines e-participation as the use of ICTs to publish information to citizens about public policies and government activities (Adnan, 2022, p. 3).

It should be noted that according to Effing et al. (2011), the importance of the participatory process of citizenship through social networks is a means of empowerment and involvement in working campaigns in terms of democracy and government representatives.

Wirtz et al. (2018), as cited in Adnan et al. (2022), state that e-participation is "a participatory process made possible by modern information and communication technologies that enables stakeholders to actively participate in public decision-making processes through the active exchange of information and, therefore, promotes fairness and representative policymaking."

Such is the case that, in Honduras, a strong impact has been evidenced with respect to technology implementation by one of the Asian tigers since, with the help of the Korean International Cooperation Agency (KOICA) and its contribution of 4 million dollars, it was decided to conduct a feasibility study in order to create a master plan for three large Special Economic Development and Employment Zones (ZEDEs) in the department of Valle, in the south of the country (Martin and Geglia, 2019).

In most Latin American countries, urban sprawl first occurred in large cities, and this process has recently slowed down and moved to secondary urban centers. In more general terms, they are located beyond the consolidated urban core in a heterogeneous process and correspond only to residential use (Barros, 2004; as cited in Barbosa et al., 2022). From this perspective, "Smart Cities public policy should be understood as what governments decide to do or not to do, in a relatively stable course of action, in order to solve the socially relevant problems of cities (Vargas, 2009).

3.11 Security in Smart Cities
Within the area of security, technologies have also been implemented to a large extent to ensure a safe environment in cities. There has been an evolution in urban surveillance by means of security cameras,

biometric sensors, drones, and other surveillance systems; most of these have been created especially for the global north, so in trying to address the challenges for countries in the global south, an adaptation will have to be made. With respect to adaptation, there is a need to focus on the areas of infrastructure, regulatory frameworks, digital inclusion, and environmental protection. Due to the current concern for adapting technologies to all aspects of cities in order to provide more effective and efficient services, the creation of public policies for the use of these technologies and a higher level of development in different areas has been proposed (Mendes, 2022).

Likewise, with respect to security, technologies and their application in the military field will be discussed, with an emphasis on Latin American countries, since security concerns such as contract killings, drug trafficking, and human trafficking have been recurrent scenarios in these territories. The commercial technologies related to Industry 4.0 that have the greatest use in the military field are the Internet of Things (IoT), communications, artificial intelligence, and technologies for sustainability and energy efficiency. All of these have been widely used for strategy and to solve problems on the battlefield. (Corzo et al., 2022).

The Internet of Things (IoT) is one of the core technologies of Industry 4.0, through which several applications are presented for the military environment that have to do with the health and safety of soldiers, detection and neutralization of threats, logistical support, supply of ammunition and combat equipment, communication between devices on the battlefield, and care in disaster situations. This technology requires a high level of security, so it is perfect for the military environment. However, in order for it to be used on a recurring basis, it is necessary to promote the solution of object identification problems, guarantee information security, and find ways to reduce costs significantly. In this sense, Latin American countries should focus their efforts on scientific research and the strengthening of human capital in order to adapt these technologies to the security forces and guarantee a dignified life for their inhabitants (Corzo et al., 2022).

On the other hand, one of the problems that paralyzed daily life was the COVID-19 pandemic; some of the main activities that were banned were cultural events, attending educational centers, sporting events, libraries, gastronomic services, offices, and stores (Zhang et al., 2021).

Therefore, to revive countries, technologies have taken full advantage of bioinformatics, computational biology, and immunoinformatics to accelerate the discovery and development of vaccines. This has led to the development of telemedicine as a form of interaction with patients. One of the most significant effects of the implementation of these technologies is the application of artificial intelligence techniques with information from the patients themselves. Consequently, what has been called "medicine" has been developed: predictive, preventive, personalized, and participatory (Arenas and Ramirez, 2023).

To ensure better management of COVID-19, the pathogens that appeared with it were investigated, and for this, the process of epidemiology based on wastewater was important. Due to this, in Latin America, universities conducted studies to detect the epidemic in wastewater, seeking to eliminate the possible risk of contagion, and currently, surveillance of possible epidemics is sought to be constant. (Prado et al., 2023)

3.12 Tourism, Economy, and Smart Cities
In relation to the tourism area, which is important for the economy at the level of each country, there has been a strong competitive relationship between the different tourist areas already recognized and those emerging in recent times. Such is the rivalry that countries have chosen to adapt technologies in order to obtain a sustainable technological development that is comfortable and innovative for tourists. (Cavalheiro et al., 2021).

Due to the efficiency that technology has proven to have in the different sectors within a country, the governments of each state have implemented local plans. As we can see in Uruguay, they follow an agenda that complies with 11 of the 13 proposed sectorial plans, and Brazil complies with 12 focusing on human resources, socioeconomics, and health. (Alves et al., 2020)

This is why, currently, states have sought to push rural areas towards web 2.0 with support from businesses, local authorities, and society in general; the future of rural areas must move towards a combination of social media, encouraging technological development for easy access to literacy, digital connectivity, health, and educational options; rural areas may have different horizons due to isolation, but this does not mean they should lack communication channels (Foronda and Galindo, 2021).

To create and manage a smart city, it must be treated as a device, so with the help of urban planners and designers, different aspects such as traffic congestion, accessibility, and the potential impact of natural disasters can be improved. (Souza and Bueno, 2022)

4. Methods

The methodology of this review will be guided by the guidelines of Kitchenham and Charters, which consist of three phases: the first phase will be to plan the literature review on smart cities, where the research questions will be specified, the review protocol will be developed, and finally it will be validated based on the search chain identified according to the subject matter.

The second phase consists of conducting the systematic literature review by identifying, selecting, evaluating, extracting, and synthesizing the data obtained from different search engines and specialized databases such as Science Direct, Scopus, Web of Science, and Redalyc.

Finally, in the third phase, where the review is documented, a report of the present review will be written and subsequently validated.

The search string used to collect the data was based on the words smart city, public policy," and "Latin America, from which, when the resulting articles were generated, it was necessary to apply inclusion and exclusion criteria; by applying them, 50 essential articles for the research were filtered.

Table 1

The matrix of questions and sub-questions to be applied to the items obtained from the search string is as follows

	SQ1: Government
	SQ2: Environment
	SQ3: Mobilization
Q1: What public policies have been used in the context of smart cities?	SQ4: Transport
	SQ5: Security
	SQ6: Education
	SQ7: Health
	SQ8: Communication
Q2: What guidelines have been proposed by the United Nations for smart cities?	SQ9: Interoperability
	SQ10: Security
	SQ11: Sustainability
Q3: In what ways have these public policies been developed in Latin American countries?	SQ12: National
	SQ13: Project development level
	SQ14: International cooperation

Note: Table 1 shows the questions and sub-questions on the basis of which the articles have been selected; PR1 mentions public policies developed for smart cities, which is why different areas were selected from SP1 to SP8 in which technologies have been applied to carry out their functions; Regarding PR2, the guidelines proposed by the United Nations for smart cities were investigated, these can be found from SP9 to SP11 and PR3 will deal with the development of public policies in the countries focusing on the proposed projects, their status and the aid received, its division will be found from SP12 to SP14.

Table 2

In addition, the following quality characteristics have been implemented

Objective questions	It has been published in a relevant journal or book.
	It has been cited by other authors.
Subjective questions	There are examples of public policies for smart cities implemented in Latin American countries.

	It includes guidelines imposed by the United Nations in the context of smart cities.

Note: Based on the characteristics mentioned in Table 2, the quality of the articles has been validated; as objective questions, it was sought whether the articles selected for the research have been cited by external authors or have been published in relevant journals or books. In the subjective questions, each article searched for cases of implementation of smart cities in Latin America and the execution of the different guidelines imposed by the United Nations.

5. Results

A search string based on the keywords smart city, public policy," and Latin America was performed in four digital libraries, from which 144 results were obtained, of which 120 were found in Science Direct, 3 in Scopus, 11 in Web of Science, and 10 in Redalyc. Inclusion and exclusion criteria were applied to these resulting articles in order to obtain adequate and accurate information.

Three inclusion criteria were presented, which are: articles that comply with the subject matter; articles published from 2015 to date; and articles in English and Spanish. On the other hand, the exclusion criteria were: articles of less than five pages; closed articles or articles that cannot be downloaded; and book chapters. After applying these criteria, 50 articles were selected, of which 40 were from Science Direct, 9 from Redalyc, and 1 from Web of Science.

Table 3

The following table shows the inclusion and exclusion criteria considered

Inclusion criteria	Articles related to the subject are included
	Articles from 2015 to present
	Articles in English and Spanish
Exclusion criteria	Excludes articles of less than 5 pages
	Items that cannot be downloaded
	Book chapters

Note: Table 3 shows the criteria that have been selected based on research, search and knowledge of the topic; that is why it has been decided to exclude articles that have less than five pages because they have little information and, in some cases, incomplete or irrelevant information for the topic, articles that cannot be downloaded because it is impossible to obtain them and book chapters because their information is limited and they do not have all the information. For inclusion, it will be taken into account that the articles are related to the topic, have been published since 2015 due to the emergence of the Sustainable Development Goals, specifically Goal 11 on sustainable cities and communities, and that they are written in English or Spanish.

Table 4

Article selection process according to inclusion and exclusion criteria

All	144
Inclusion	132
Exclusion	75
Title-Abstract	63
In-depth reading	50
TOTAL	50 articles to be used

Note: Table 4 shows the 144 initial articles related to our thematic and the selected digital libraries, we will also see that after applying the inclusion criteria the number of articles decreases to 132 due to the language criteria, for exclusion there is a significant drop of articles obtaining only 75, either because their download is impossible, they have less than five pages or they are book chapters; After reading and analyzing the title and summary of these articles, the number decreased to 63, since there were irrelevant articles for the research. Finally, an in-depth reading of the remaining articles was carried out and it was decided to use 50 articles that fit the subject matter and were relevant to our research.

Figure 1

Percentage of published systematic literature review articles from 2015 to 2023
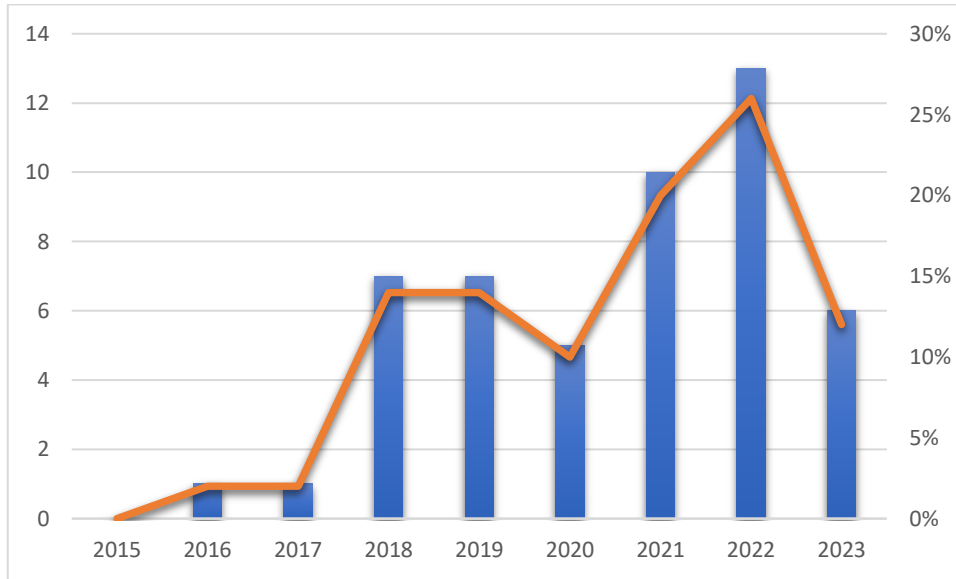
Note: Figure 1 shows that the articles were compiled since 2015 with the appearance of the Sustainable Development Goals and targets at the United Nations General Assembly that took place on September 25 of the same year. It is relevant to mention this fact due to the fact that goal 11 of the SDGs, Sustainable Development Goals, is Sustainable Communities and Cities which is the main axis of this review. The year 2015 is taken into account as the starting point; review articles up to the year 2023 were analyzed. The year 2022 stands out because a percentage of 28% of review articles were collected, which were taken into account for the theoretical basis of this article, and the year 2021, from which 20% of articles were collected. For the year 2022, articles focused on the implementation of technology for the administration of cities, electronic participation, technological innovation, climate change, traffic and mobilization stand out.

Figure 2

The following figure shows the results by year of publication
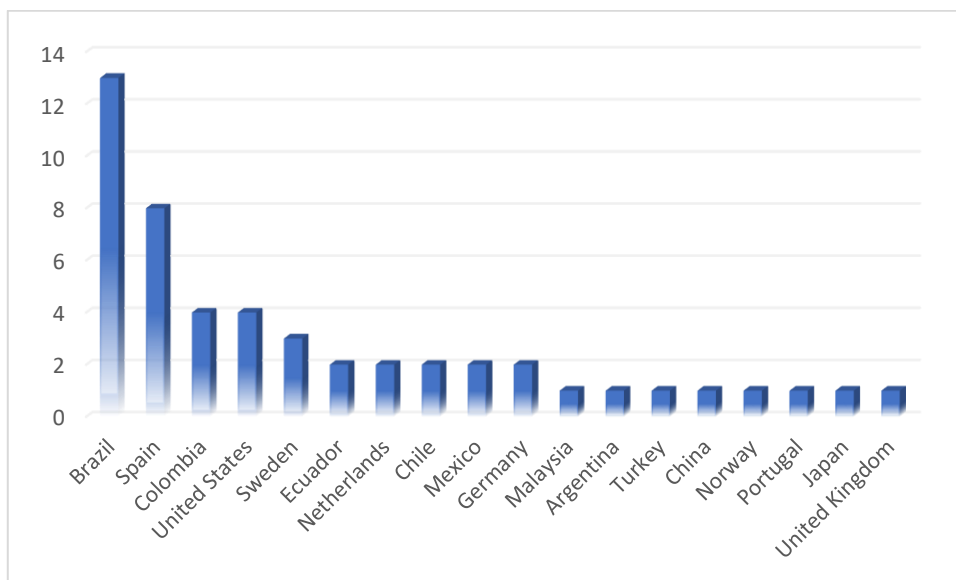
Note: Figure 2 shows that of the 50 articles selected, 13 correspond to articles published in Brazil, thus, it is identified as the most representative Latin American country in the implementation of smart cities. The

following published articles [Art1], [Art2], [Art9], [Art11], [Art13], [Art15], [Art32], [Art40], [Art41], [Art42], [Art45], [Art46], and [Art49], were used in the theoretical framework to exemplify cases of smart cities in Latin America. It is noteworthy that the corresponding authors discuss the structuring of government and the importance of e-participation. It is interesting to mention that Brazil has implemented in its cities smart projects that have provided and improved connectivity thus fostering communication and the use of renewable energy. Regarding Spain 8 of the 50 articles; [Art17], [Art18], [Art19], [Art21], [Art24], [Art33], [Art33], [Art36], and [Art47] the authors focused their research on analyzing the technological evolution and its correct application in different functions, the importance of the environment, climate change and the scope of smart initiatives. These articles were used as a theoretical framework basis for a deeper understanding of the concept of Smart cities. The remaining 29 articles were published in Latin American, North American, European and Asian countries where various cases of smart cities and their evolution are evidenced, likewise it should be noted that this review does not take into account the obstacles and disadvantages of the implementation of smart initiatives in cities.

Figure 3

Articles related to government and environment
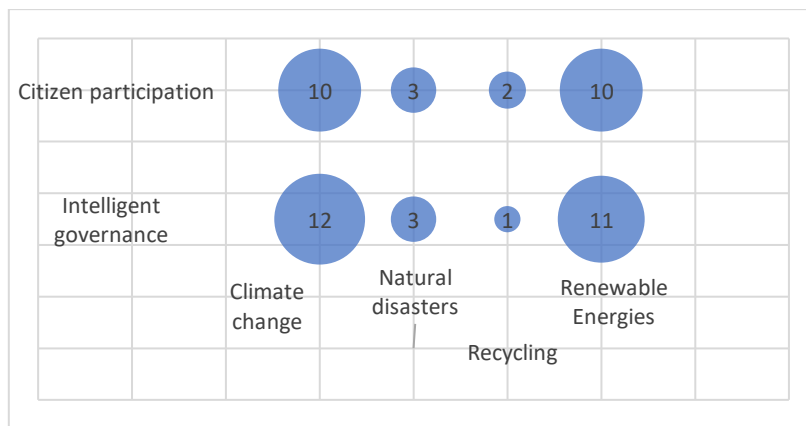
Note: Of the 50 articles reviewed, 32% correspond to SP1, where it is relevant to mention that of the various articles reviewed, [Art1], [Art2], and [Art5] share in common the central idea of e-government and active citizen participation, together with the implementation of initiatives that promote transparent and effective governance in cities through the use of technology. In relation to PR1, these articles received 32% of the response, where the present review highlights public policies for the improvement of traffic in cities, technological implementation in mobilization, and intelligent projects in terms of connectivity that streamline communication between the government and the citizen population. In relation to PR1, SP2 has a response rate of 18%, highlighting articles [Art13], [Art22], [Art24], [Art26], [Art35], [Art44], and [Art50], which focus on greening, climate change, and environment. When analyzing them, it can be inferred that smart initiatives must be in harmony with the environment and mitigate climate change, and in relation to governance, [Art1] talks about the greening of communication and information technologies and their implementation in e-government management in order to make them sustainable for the population within the cities.

Figure 4

Articles related to governance and interoperability
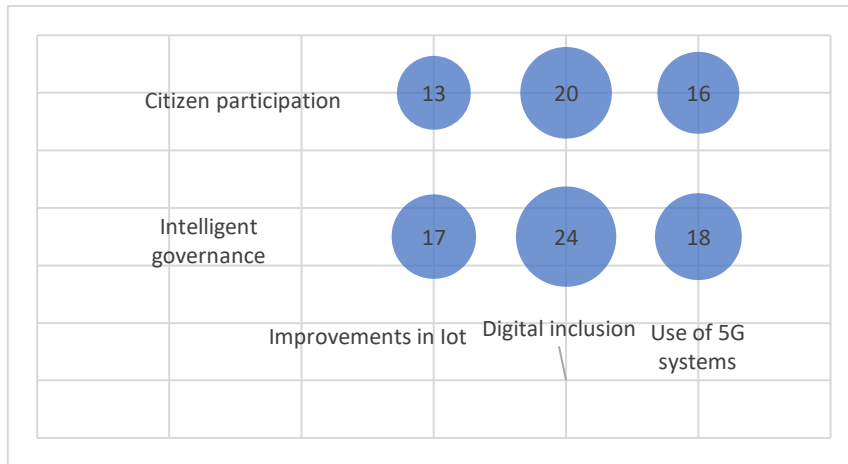
Note: When relating PR2 with the review articles corresponding to the topic SP9, a 58% response percentage is obtained where the authors of [Art8], [Art10], [Art11], [Art15], [Art21], [Art36], [Art37], [Art38], and [Art42] coincide with the influence of social networks for social inclusion and the importance of geographic location for intelligent life within the cities. It is important to mention that [Art38], mentions the importance of technological innovation for energy transition, the present review after the respective analysis deduces that through the implementation of technology it is possible to use renewable energies in order to create a smart city with a population that uses, according to [Art11] digital tools that make possible the use, development and improvement of governmental websites and digitalization in rural areas [Art36].

Figure 5

Articles related to government and security
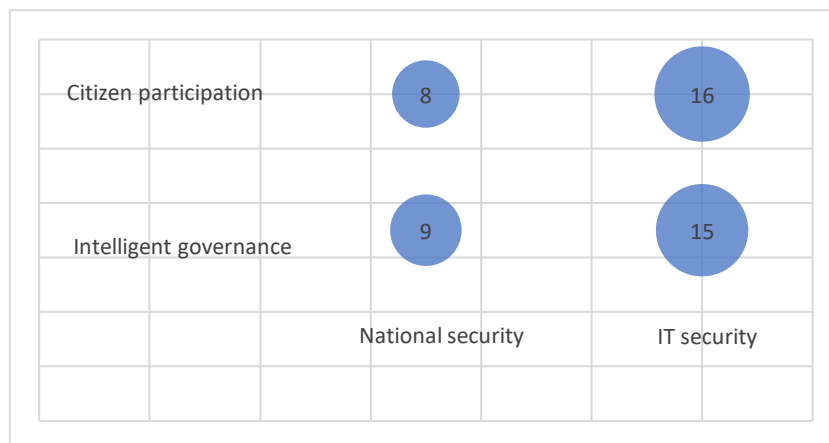
Note: For PR2, the response percentage obtained from SP10 is 22%, where the authors of articles [Art4] and [Art25] highlight the use of technology to increase citizen security in cities with the implementation of cameras and processes that streamline communication through social networks and models that promote transparency in governmental processes both nationally and internationally through the use of Information and Communication Technologies. It should be noted that the authors of [Art5], [Art30], and [Art31] mention the importance of implementing smart initiatives and projects in cities, and together with the government and citizen participation, improve security, productivity and quality of life of citizens.

Figure 6

Articles related to governance and sustainability
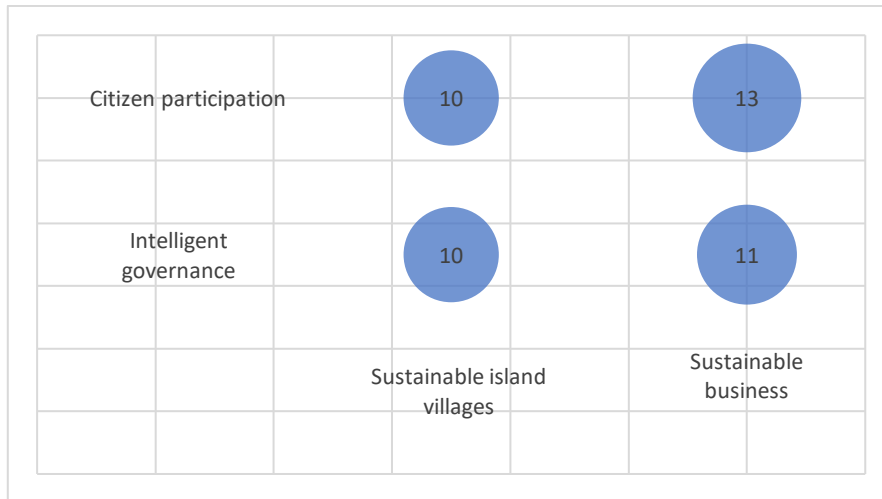
Note: To answer PR2, the response percentage obtained from SP11 was 21%, where [Art9], [Art27], and [Art45] stand out, highlighting the importance of sustainability for technological and social development, which should be worked together to minimize the risks of implementing smart initiatives and maximize the benefits for citizens in cities. By relating the analysis obtained with [Art12], [Art25], [Art31], [Art42], [Art47], and [Art48], it is inferred that sustainability is based on active citizen participation where technological implementation in conjunction with smart governance must ensure an improvement in the quality of life of citizens through transparent and effective processes that promote technological innovation, economic productivity and social inclusion.

Figure 7

Articles related to security and interoperability
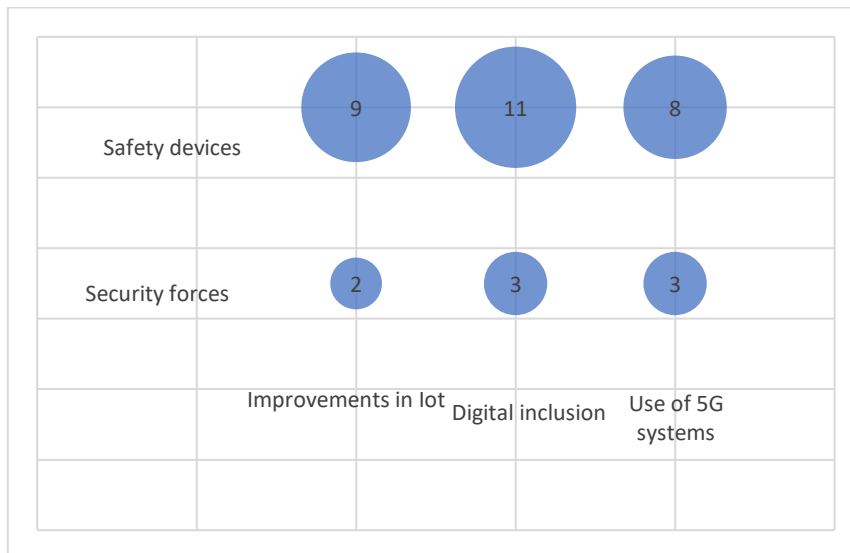
Note: According to Figure 7, regarding the topic SP5 which represents 8% of PR1, in [Art33] they have developed a study of open government data repositories seeking that the public can access them and motivate their electronic participation in the governance of a State, however, the implementation of these systems is still limited due to lack of data and the null training of users, therefore, it is necessary a deep interaction with the government and train the population according to their interests for these issues, in addition, in order to identify the development and success of government sites corresponding to SP9 which represents 58% of PR2, the [Art37] has proposed different analysis techniques using data from a ranking of state government portals and giving recommendations to improve the evaluation of digital government services in order to provide a better service.

Figure 8

Articles related to communication and interoperability
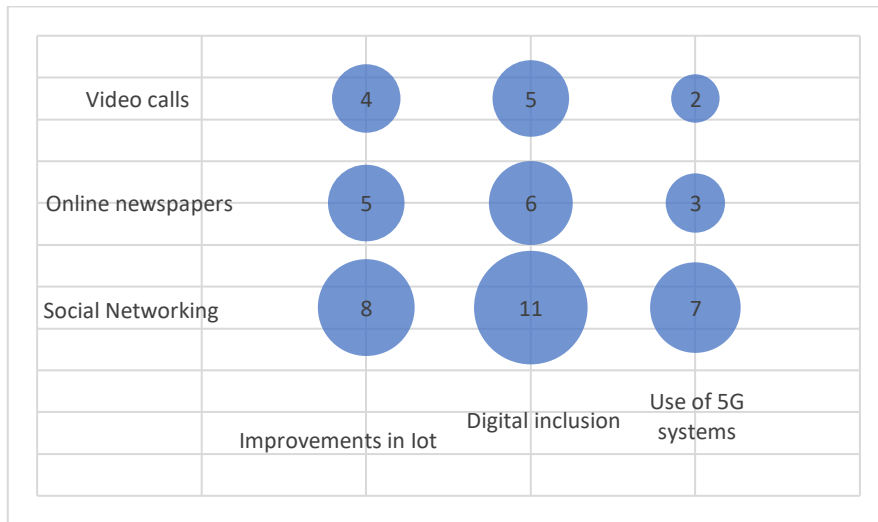
Note: Figure 8 highlights [Art37] with respect to SP8, which represents 13% of PR1, with a significant proposal to improve communication between the government and the population, proposing a series of questions and analysis of data collected in previous years; All this in order to extend the country's information, that citizens are active characters who propose ideas and are aware of state situations at all times; likewise, the [Art31] that speaks of SP9 representing 58% of PR2 propose a comprehensive model that ensures the success of digital government in Mexico based on data collected from the 32 states.

Figure 9

Articles related to interoperability and sustainability
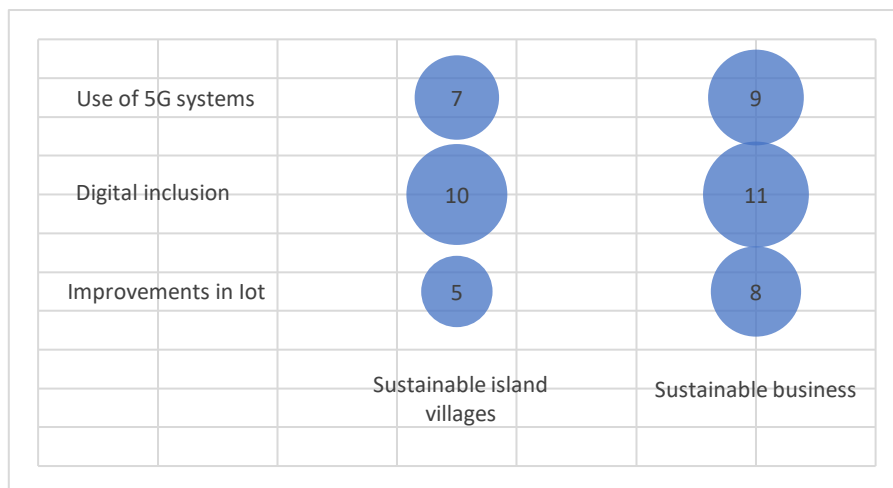
Note: For Figure 9, [Art28] talks about SP9 which corresponds to 58% and SP11 which corresponds to 21% of PR2, making known the project carried out by the Korean agency for international cooperation (KOICA) and the Honduran government, which seeks to explore the main urban economic zones of Honduras, through the transfer of international policies between these two regimes, in addition KOICA would provide 4 million dollars to carry out feasibility studies for projects in each zone and a master plan for the realization of the same, offering the transfer of knowledge and the necessary technological assistance.

Figure 10

Articles related to government and international cooperation

Figure showing bubble chart with Citizen participation and Intelligent governance rows, and Bilateral/Multilateral, NGO's, Others columns.

	Bilateral/Multilateral	NGO's	Others
Citizen participation	4	2	11
Intelligent governance	4	3	10
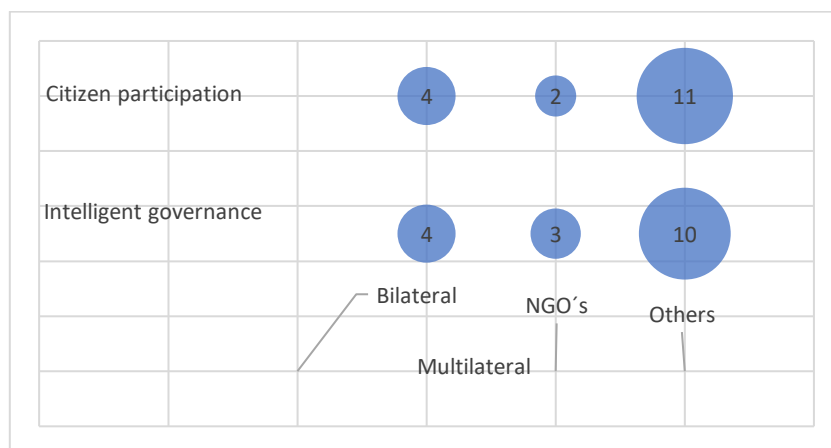
Note: For Figure 10, [Art13] deals with the topic SP1 which corresponds to 32% of PR1 and reports on the research conducted in Passo Fundo-Brazil, in which 526 residents were interviewed about improvements for the city and most agreed that the main concerns were health and the environment; therefore, the government proposed a bicycle sharing system in an attempt to reduce the harmful carbon generated by cars and achieve an ecological mobility; [Art16] instead, conducted studies on SP14 which represents 30% of PR3 and deals with the application of cooperation projects and techniques applied in other countries that guarantee total success in the basic dimensions of a smart city, in their study they also offer recommendations to reach a real development and comparisons between 44 cities around the world by means of the Technique of Ordered Preference by Similarity to the Ideal Solution.

6. Discussion

The main theme of the sources found and selected is to define smart cities and their implementation in the different Latin American countries and the different productive areas of the cities. In addition, they briefly explain the emergence of this term and its association with the Sustainable Development Goals driven since 2015 by the United Nations focusing on goal eleven of sustainable cities and communities.

The research conducted in this article was mainly based on the guidelines proposed by the United Nations for the creation and management of a smart city, in relation to this framework the main axis of analysis is the emergence of laws based on United Nations guidelines with execution in Latin America, their implementation and development as public policies in order to regulate specific functions in each productive, educational, security, etc.

The search was limited by several factors such as language, the year of appearance of the Sustainable Development Goals, the guidelines imposed by the United Nations, the public policies generated in Latin American countries, their application and development.
This research generates new issues related to public policies for smart cities imposed by different governments in Latin America, as well as emerging areas in which technology could be implemented in cities and, together with government administration and citizen participation, promote innovation and economic productivity.

It is important to highlight the use of Information and Communication Technologies (ICT's) in health, mobility and traffic, the new research axis that could be studied according to the constant technological advances is the implementation and development of artificial intelligence as a model of government and driving force of citizen participation.

In addition, education is considered the basis of innovation, so it is relevant to study the scope of technology in it, together with security, social and financial stability indexes, in order to elucidate a more realistic and accurate indicator of human development. It is also proposed to carry out a study on artificial intelligence and its scope in the field of health in order to prevent diseases and global pandemics.

7. Conclusions

This paper concludes by identifying Brazil as the Latin American country of reference for the implementation of sustainable smart initiatives in cities. It highlights the relevance of smart projects that are implemented for the governance of each city as well as the use of ICTs to promote citizen participation as the main axes of Smart Cities. The Latin American cities mentioned throughout the review—Rio de Janeiro, Curitiba, Campo Grande, Buzios, Santiago de Chile, Temuco, Cuenca, etc.—have implemented and maintained over the years smart projects and initiatives that promote the structuring of smart cities, which have been carried out in the sectors of tourism, urban mobility, green industrialization, traffic, etc., resulting in increased productivity and innovation. With the creation of smart cities, whose goal is the welfare and quality of life of citizens, public policies have been developed that are responsible for regulating the development and implementation of these in each area. The guidelines that have been taken into account for the structuring of smart cities have been provided by the United Nations in order to progressively comply with goal eleven of the SDGs, the Sustainable Development Goals: sustainable cities and communities. This organization is in charge of structuring the guidelines for their creation and management. Specific guidelines were recognized to guide countries and their cities in the creation, promotion, and improvement of sustainable development through the use of information and communication technologies.

In addition, the United Nations created the International Telecommunication Union, which is a regulatory body for the technologies present and their use in the countries of the world; The examples reviewed above demonstrate the expansion and concern that has been given with respect to the issue of digitization of sectors either to avoid increased pollution, perform activities effectively, attract tourism to the country or even seek the comfort of citizens, it is there that we can understand the true importance of the use of technologies, the correct management, the existence of an institution such as the ITU and the steps to be taken to reach a sustainable city with projects carried out by the various governments and citizen participation in a country.

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Appendice 1

Matriz de artículos definitivos a utilizarse, de acuerdo a criterios de inclusión y exclusión.

Tipo de fuente	Autor	Título	Codificación de las fuentes	Año de publicación	País de origen	Contenido teórico general	Contenido teórico específico	Base de datos
Artículo	Mendes, V.	Climate smart cities? Technologies of climate governance in Brazil	Art1	2022	Brasil	Gobernanza climática en Brasil	Implementación de tecnologías verdes en Brasil	Science Direct
Artículo	Cavalheiro, M. B., Joia, L. A., do Canto Cavalheiro, G. M., & Mayer, V. F.	Smart Tourism Destinations: (Mis)Aligning Touristic Destinations and Smart City Initiatives	Art2	2021	Brasil	Iniciativas para el turismo inteligente	Aplicación de tecnologías para el turismo inteligente	Redalyc
Artículo	Gomis-Balestreri, M.	Del gobierno electrónico al bigdata: la digitalización de la gestión pública en Colombia frente al control territorial	Art3	2017	Colombia	Digitalización de la gestión pública	Gestión de políticas públicas en Colombia y su territorio	Redalyc
Artículo	Corzo Ussa, G. D., Álvarez-Aros, E. L., & Chavarro Miranda, F.	La industria 4.0 y sus aplicaciones en el ámbito militar: oportunidad estratégica para Latinoamérica	Art4	2022	Colombia	Tecnología en el ámbito militar	Implementación de tecnologías en el ámbito militar en Colombia	Redalyc
Artículo	Adnan, M., Ghazali, M., & Othman, N. Z. S. (2022).	E-participation within the context of e-government initiatives: A comprehensive systematic review	Art5	2022	Malasia	Participación y gobierno inteligente	Iniciativas conjuntas para el gobierno y la participación ciudadana	Science Direct
Artículo	Juan Ignacio Fulponi	Traffic congestion in Buenos Aires: diagnosis and public policy recommendations for a more sustainable city	Art6	2023	Argentina	Tráfico en ciudades sostenibles	Políticas públicas para la gestión de tráfico en Buenos Aires	Science Direct
Artículo	Josep A. Ivars-Baidal, Marco A. Celdrán-Bernabeu, Francisco Femenia-Serra, José F. Perles-Ribes, J. Fernando Vera-Rebollo.	Smart city and smart destination planning: Examining instruments and perceived impacts in Spain	Art7	2023	España	Turismo inteligente en un país	Destinos inteligentes para el turismo	Science Direct
Artículo	Emilene Leite	Innovation networks for social impact: An empirical	Art8	2022	Suecia	Redes y su impacto social	El impacto de las redes sociales en la	Science Direct

Tipo	Autores	Título	Código	Año	País			Base
		study on multi-actor collaboration in projects for smart cities					población en todos sus ámbitos	
Artículo	Janaina Macke, Rodrigo M. Casagrande, João Alberto R. Sarate, Kelin A. Silva	Smart city and quality of life: Citizens' perception in a Brazilian case study	Art9	2018	Brasil	Ciudades inteligentes y calidad de vida	Perspectiva de los ciudadanos de la calidad de vida en Brasil	Science Direct
Artículo	Charles Travis	GeoHumanities, GIScience and Smart City Lifeworld approaches to geography and the new human condition	Art10	2016	Estados Unidos	Vida inteligente	Ciudades sostenibles y su influencia geográfica	Science Direct
Artículo	Lara Sucupira Furtado, Ticiana Linhares Coelho da Silva, Marianna Gonçalves Fontenele Ferreira, Jessika Kantnila de Melo Lima Cavalcanti Moreira, José Antônio Fernandes de Macedo	A framework for Digital Transformation towards Smart Governance: using big data tools to target SDGs in Ceará, Brazil	Art11	2023	Brasil	Herramientas para la transformación digital	Herramientas del gobierno inteligente para la transformación de Ceará	Science Direct
Artículo	Bernardo Puente-Mejia, Laura Palacios-Argüello, Carlos Suárez-Núñez, Jesus Gonzalez-Feliu	Freight trip generation modeling and data collection processes in Latin American cities. Modeling framework for Quito and generalization issues	Art12	2019	Ecuador	Recolección de datos en Latinoamérica	Recolección de datos para la sostenibilidad de países latinoamericanos	Science Direct
Artículo	Priscila Sardi Cerutti, Rosiane Dutra Martins, Janaina Macke, João Alberto Rubim Sarate	"Green, but not as green as that": An analysis of a Brazilian bike-sharing system	Art13	2019	Brasil	Sistema de bicicleta compartida	Uso de bicicletas como transporte sostenible en Brasil	Science Direct
Artículo	Emilene Leite, Mads Bruun Ingstrup	Individual strategies as interaction modes for handling institutional logic diversity over time: A case study on a public-private collaboration project	Art14	2022	Suecia	Estrategias para instituciones público-privadas	Análisis de la diversidad de ideas y el trabajo de las asociaciones público-privadas	Science Direct
Artículo	Diego André Sant'Ana, Marcio Carneiro Brito Pache, Pedro Pereira Borges, Jefferson Levy Espindola Dias	Accessibility and digital inclusion in Brazil and South Korea: A comparison between micro and macro territorial approach	Art15	2021	Brasil	Inclusión de tecnología en Brasil y Corea del Sur	Inclusión digital y cooperación entre Corea del Sur y Brasil	Science Direct

Artículo	Gokhan Ozkaya, Ceren Erdin	Evaluation of smart and sustainable cities through a hybrid MCDM approach based on ANP and TOPSIS technique	Art16	2020	Turquía	Evaluación de ciudades sostenibles	Antecedentes y técnicas para ciudades sostenibles	Science Direct
Artículo	Edward Glaeser, Karima Kourtit, Peter Nijkamp	New urban challenges: Shared spaces in smart places – Overview and positioning	Art17	2021	Países Bajos	Espacios compartidos	Nuevos retos para la urbanización	Science Direct
Artículo	Francisco Ramirez, Pedro Palominos, Mauricio Camargo, Didier Grimaldi	A new methodology to support smartness at the district level of metropolitan areas in emerging economies: The case of Santiago de Chile	Art18	2021	España	Inteligencia en economías emergentes	Mecanismos para la urbanización de la metrópolis en Chile	Science Direct
Artículo	José Guimón, Cristina Chaminade, Claudio Maggi, Juan Carlos Salazar-Elena	Policies to Attract R&D-related FDI in Small Emerging Countries: Aligning Incentives With Local Linkages and Absorptive Capacities in Chile	Art19	2018	España	Políticas en países emergentes	Políticas relacionadas con la capacidad de las ciudades en Chile	Science Direct
Artículo	SHI Jia, LEE Ching-Hung, Xuesong GUO, ZHU Zhengwei	Constructing an integrated stakeholder-based participatory policy evaluation model for urban traffic restriction	Art20	2020	China	Tráfico urbano	Política de participación para la gestión y resolución del tráfico	Science Direct
Artículo	Josep A. Ivars-Baidal, Marco A. Celdrán-Bernabeu, Francisco Femenia-Serra, José F. Perles-Ribes, David Giner-Sánchez	Measuring the progress of smart destinations: The use of indicators as a management tool	Art21	2021	España	Progreso de los destinos inteligentes	Implementación de tecnología en destinos turísticos.	Science Direct
Artículo	Diego Ponce de Leon Barido, Stephen Suffian, Daniel M. Kammen, Duncan Callaway	Opportunities for behavioral energy efficiency and flexible demand in data-limited low-carbon resource constrained environments	Art22	2018	Estados Unidos	Eficiencia energética	Oportunidades para disminuir la carga de carbono en la generación de energía	Science Direct

Artículo	Daniel Icaza, David Borge-Diez, Santiago Pulla Galindo	Proposal of 100% renewable energy production for the City of Cuenca- Ecuador by 2050	Art23	2021	Ecuador	Energía renovable	Producción de energías renovables en Cuenca para el año 2050	Science Direct
Artículo	Miguel Soberón, Teresa Sánchez-Chaparro, Adrian Smith, Jaime Moreno-Serna, Valentina Oquendo-Di Cosola, Carlos Mataix	Exploring the possibilities for deliberately cultivating more effective ecologies of intermediation	Art24	2022	España	Cultivos ecológicos	Posibilidades de crear cultivos más ecológicos	Science Direct
Artículo	Anneke Zuiderwijk, Yu-Che Chen, Fadi Salem	Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda	Art25	2021	Países Bajos	Inteligencia artificial	El uso de la inteligencia artificial en la gobernanza pública	Science Direct
Artículo	Alexander Dunlap	The green economy as counterinsurgency, or the ontological power affirming permanent ecological catastrophe	Art26	2023	Noruega	Economía verde	La economía verde tomada como una catástrofe ecológica	Science Direct
Artículo	Blaise Booponoyeng Bayuo, Cristina Chaminade, Bo Göransson	Unpacking the role of universities in the emergence, development and impact of social innovations – A systematic review of the literature	Art27	2020	Suecia	Universidades y su impacto	Rol de las universidades en el desarrollo y su impacto en la innovación	Science Direct
Artículo	Bridget Martin, Beth Geglia	Korean tigers in Honduras: Urban economic zones as spatial ideology in international policy transfer networks	Art28	2019	Estados Unidos	Economía urbana: Corea del Sur y Honduras	Presencia de los tigres coreanos en honduras y su proyecto económico	Science Direct
Artículo	Gloria Baigorrotegui B.	Destabilization of Energy Regimes and Liminal Transition through Collective Action in Chile	Art29	2019	Chile	Acción colectiva	Desestabilización del área energética y su acción en Chile	Science Direct
Artículo	Lake Sagaris	Citizen participation for sustainable transport: Lessons	Art30	2018	Chile	Participación en el transporte sostenible	Participación ciudadana y su	Science Direct

Tipo	Autores	Título	ID	Año	País	Tema	Descripción	Fuente
		for change from Santiago and Temuco, Chile					impacto en el área de transporte en Chile	
Artículo	J. Ramon Gil-Garcia, Miguel Á. Flores-Zúñiga	Towards a comprehensive understanding of digital government success: Integrating implementation and adoption factors	Art31	2020	México	Éxito del gobierno inteligente	Entendimiento del gobierno inteligente y sus factores adoptados	Science Direct
Artículo	Felipe Ferreira de Lara, Roberto Marx	Comparative positioning between Brazilian subsidiaries and European matrices on Electromobility and carsharing technologies	Art32	2018	Brasil	Comparación entre Brasil y países de Europa	Comparación entre Brasil y los países europeos en la electromovilidad	Science Direct
Artículo	Mila Gascó-Hernández, Erika G. Martin, Luigi Reggi, Sunyoung Pyo, Luis F. Luna-Reyes	Promoting the use of open government data: Cases of training and engagement	Art33	2018	EEUU	Uso de datos gubernamentales	Casos de promoción de un gobierno abierto	Science Direct
Artículo	Jorge Arenas Gaitán, Patricio E. Ramírez-Correa	COVID-19 and telemedicine: A netnography approach	Art34	2023	España	Telemedicina	Telemedicina y su presencia en la crisis del Covid-19	Science Direct
Artículo	Fátima Alves, Walter Leal Filho, Paula Casaleiro, Gustavo J. Nagy, Harry Diaz, Abul Quasem Al-Amin, José Baltazar Salgueirinho Osório de Andrade Guerra, Margot Hurlbert, Harith Farooq, Maris Klavins, Mustafa Saroar, Eliska Krkoska Lorencova, Suresh Jain, Amadeu Soares, Fernando Morgado, Paul O'Hare, Franziska Wolf, Ulisses M. Azeiteiro	Climate change policies and agendas: Facing implementation challenges and guiding responses	Art35	2020	Alemania	Políticas de cambio climático	Agendas para el cambio climático y como guiar su ejecución	Science Direct
Artículo	C. Foronda-Robles, L. Galindo-Pérez-de-Azpillaga	Territorial intelligence in rural areas: The digitization of non-profit associations through social media	Art36	2021	España	Inteligencia en áreas rurales	Digitalización de áreas rurales	Science Direct
Artículo	Gabriel Puron-Cid, Dolores E. Luna, Sergio Picazo-Vela, J. Ramón Gil-Garcia, Rodrigo Sandoval-Almazan, Luis F. Luna-Reyes	Improving the assessment of digital services in government websites: Evidence from the Mexican State government portals ranking	Art37	2022	México	Servicios digitales	Sitios web gubernamentales y sus servicios prestados	Science Direct

Artículo	Alaize Dall-Orsoletta, Fernando Romero, Paula Ferreira	Open and collaborative innovation for the energy transition: An exploratory study	Art38	2022	Portugal	Innovación de energía	Innovación y colaboración para la transición energética	Science Direct
Artículo	Junyi Zhang, Yoshitsugu Hayashi, Lawrence D. Frank	COVID-19 and transport: Findings from a world-wide expert survey	Art39	2021	Japón	Transporte y pandemia	Ejecución del transporte público en la época de pandemia	Science Direct
Artículo	Mariana Brandão, Luiz Antonio Joia	The influence of context in the implementation of a smart city project: the case of Cidade Inteligente Búzios	Art40	2018	Brasil	Influencia del contexto en ciudades inteligentes	Influencia de una ciudad inteligente en Búzios	Redalyc
Artículo	Tatiana Prado, Gloria Rey-Benito, Marize Pereira Miagostovich, Maria Inês Zanoli Sato, Veronica Beatriz Rajal, Cesar Rossas Mota Filho, Alyne Duarte Pereira, Mikaela Renata Funada Barbosa, Camille Ferreira Mannarino, Agnes Soares da Silva	Wastewater-based epidemiology for preventing outbreaks and epidemics in Latin America – Lessons from the past and a look to the future	Art41	2023	Brasil	Prevención de enfermedades	Aguas residuales y tecnología usada para evitar epidemias	Science Direct
Artículo	Letícia Souza, Cristiane Bueno	City Information Modelling as a support decision tool for planning and management of cities: A systematic literature review and bibliometric analysis	Art42	2022	Brasil	Modelado de una ciudad	Herramientas para la toma de decisiones y guía en ciudades inteligentes	Science Direct
Artículo	Juan Jose Paredes, Santiago Felipe Yepes, Ricardo Salazar-Cabrera, Álvaro Pachón de la Cruz, Juan Manuel Madrid Molina	Intelligent collision risk detection in medium-sized cities of developing countries, using naturalistic driving: A review	Art43	2022	Colombia	Desastres naturales	Detección de riesgos de colisión en ciudades y sus carreteras	Science Direct
Artículo	Stelvia Matos, Eric Viardot, Benjamin K. Sovacool, Frank W. Geels, Yu Xiong	Innovation and climate change: A review and introduction to the special issue	Art44	2022	Reino Unido	Innovación en las ciudades	Innovación en estrategias de cambio climático para las ciudades	Science Direct
Artículo	Vasco Barbosa, Mónica Marcela Suárez Pradilla, Lakshmi Priya Rajendran	Peri-urbanization, dynamics, and challenges in developing countries towards sustainable	Art45	2022	Brasil	Dinámicas para sostenibilidad	Retos para el crecimiento urbano sostenible	Redalyc

		urban growth - Special Section Editorial						
Artículo	Augusto P. Pereira, Mario Prokopiuk	Critical junctures and events in the trajectory of information modeling in Curitiba	Art46	2022	Brasil	Eventos de modelado en Curitiba	Aplicación de inteligencia para guiar el desarrollo de Curitiba	Redalyc
Artículo	Diana Martinez-Mosquera, Sergio Luján-Mora	Framework for Big Data integration in e-government	Art47	2019	España	Data y gobierno electrónico	Integración de la Big data en un gobierno electrónico	Redalyc

Artículo	Carlos Wladimir Gómez Cárdenas	La movilización internacional de las ideas. Enfoques, conceptos y actores en el estudio de la transferencia y adaptación de políticas públicas	Art48	2019	Colombia	Adaptación de políticas públicas	Movilización de ideas y su aplicación en la adopción de políticas públicas	Redalyc
Artículo	Luis Andre Wernecke Fumagalli, Denis Alcides Rezende, Thiago Andre Guimar~aes	Challenges for public transportation: Consequences and possible alternatives for the Covid-19 pandemic through strategic digital city application	Art49	2021	Brasil	Transporte público y pandemia	Retos y alternativas dadas en la época de pandemia para los transportes públicos	Science Direct
Artículo	Weng, W (Weng, Wei) [1] , [2] , [3] ; Costa, L (Costa, Luis) [1] ; Ludeke, MKB (Luedeke, Matthias K. B.) [1] ; Zemp, DC (Zemp, Delphine C.)	Aerial river management by smart cross-border reforestation	Art50	2019	Alemania	Reforestación y riego	Ríos aéreos y su apoyo en la reforestación	WOS

Nota: esta tabla demuestra los artículos que fueron elegidos para la investigación del tema.

Appendice 2

Matriz del porcentaje de respuestas por artículo con respecto a las preguntas formuladas.

			Total	Porcentaje de Respuesta	Porcentaje total por pregunta
PR1: ¿Qué políticas públicas han sido utilizadas en el contexto de ciudades inteligentes?	SP1: Gobierno	Gobernanza inteligente	38	18%	100%
		Participación ciudadana	30	14%	
	SP2: Medioambiente	Cambio climático	18	8%	
		Desastres naturales	3	1%	
		Reciclaje	2	1%	
		Energías Renovables	17	8%	
	SP3: Movilización	Turismo	7	3%	
		Migración	5	2%	
	SP4: Transporte	Trasporte verde	13	6%	
		Sistemas de recaudo	4	2%	
	SP5: Seguridad	Cuerpos de seguridad	4	2%	
		Dispositivos de seguridad	13	6%	
	SP6: Educación	Clases en línea	7	3%	
		Aplicaciones educativas	1	0%	
		Libros electrónicos	3	1%	
		Sitios web educativos	5	2%	
	SP7: Salud	Prevención de epidemias	4	2%	
		Modelos de autoaprendizaje	3	1%	
		Equipos médicos inteligentes	6	3%	
		Telemedicina	4	2%	
	SP8: Comunicación	Redes Sociales	13	6%	
		Periódicos online	8	4%	
		Videollamadas	7	3%	
PR2: ¿Qué lineamientos han sido propuestos por las Naciones Unidas para ciudades inteligentes?	SP9: Interoperabilidad	Mejoras en el Iot	20	16%	100%
		Inclusión digital	30	23%	
		Uso de sistemas 5G	24	19%	
	SP10: Seguridad	Seguridad nacional	10	8%	
		Seguridad informática	18	14%	
	SP11: Sostenibilidad	Aldeas en islas sostenibles	11	9%	
		Negocios sostenibles	15	12%	
PR3: ¿De qué maneras se han desarrollado estas políticas públicas en los países de Latinoamérica?	SP12: Nacional	Urbano	16	21%	100%
		Rural	10	13%	
	SP13: Nivel de desarrollo de proyectos	Pendientes	10	13%	
		En proceso	10	13%	
		Finalizados	7	9%	
	SP14: Cooperación internacional	Bilateral	3	4%	
		Multilateral	4	5%	
		ONG´s	3	4%	
		Otros	13	17%	

Nota: En el Anexo 2 se puede ver el porcentaje relacionado con las respuestas a las preguntas PR1, PR2 Y PR3 de las cuales cada una representa el 100%, además, se dan las divisiones desde SP1 hasta SP8 en PR, SP9 hasta SP11 en PR2 y SP12 hasta SP14 en PR3, dentro de cada una existen distintas temáticas especificadas en el anexo con sus respectivos porcentajes.