

## Green cities - a key element of the sustainable economy

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**Abstract:** Sustainable management in the field of sustainable cities is extremely important because cities continue to grow at an extremely high global rate. Cities are very important to the world economy, because more than most people live in urban areas. The research conducted in this paper aims to show the impact of sustainable cities and the importance of their development in the world economy, given their many benefits - environmental, social and cultural. Authorities also need to take appropriate economic policy measures to improve all urban sectors, depending on local specificities and development needs. The methods used, both quantitative and, in particular, qualitative, highlight the role of sustainable, green and smart cities and sustainable management, taking into account the fast changes in the evolution of urban population and urban life worldwide.

**Keywords:** sustainable management, sustainable cities, smart cities, green urbanization

**JEL:** A12, A13, E24, E61, F42, F53, I15, I31, J11, O18, O32, O44, Q20, Q56

## 1. Introduction

Cities are very important for the world economy as more than most of the people live in urban areas, 55% as a global average, the sustainable economy means having greener and cleaner cities in which to reduce or eliminate social inequities and negative effects on the environment to be more economically efficient. Worldwide, more than four billion people live in cities and within the European Union the urban population represents over 2/3 of the total population. According to the forecast made by international organizations, in the middle of this century the urban population will reach a percentage of 68% of the total world population (United Nations Department of Economics and Social Affairs, 2018).

Due to high energy consumption (between three and four-fifths of the world's energy consumption) from the intense activities that take place inside cities, they are responsible for most of the greenhouse gas emissions, given that on an area of only 3% of the Earth's, they produce four-fifths of the global gross domestic product (GDP). The importance of green cities stems from the fact that, compared to traditional cities, their impact on the environment is smaller, the social domain is given more importance because social equity and quality of life are visibly improved and there is a greater possibility for research units to collaborate with universities and all the other economic actors interested in it. The degree of innovation is higher and therefore, the productivity is higher, both as a result of the positive effects determined by the technological progress, as well as the fact that there is an improvement in the health system and in the working environment for citizens, which also leads to a reduction in costs and to an increase in profits. At present there are fewer green cities in their entirety but rather cities that have implemented different types of green projects.

The possibility of developing only sustainable cities faces the problem of the rapid pace of urbanization which is manifested both by developing and by increasing the size of cities and by transforming some rural areas into cities. Increasing urbanization means solving many new problems, primarily related to increased resource consumption, including the energy and increased flows of goods and people. In order to achieve these objectives, all the decision-makers have an important role to play, from the level of each economic subject to the national and global level.

It is said that "managers design and implement organizational strategies and policies, the fundamental objective of which is to obtain sustainable competitive advantages. ... Entrepreneurs and managers need to gain the support of leaders in substantiating, adopting and implementing organizational change projects, which are essential in an increasingly dynamic business environment" (Ionescu, 2020). Achieving competitive advantage constitutes a key issue not only for the top management of any organization but also of any city and country competing in an increasingly turbulent environment, characterized by continuous innovation and digitalization. In this respect, managers have to design and implement their own competitive strategies in order to face today's hyper-competition worldwide.

In the green cities, the emphasis is also on the access of all categories of population to various services and activities. The more compact forms of the city are considered to be more advantageous because they reduce transport distances, making them more energy efficient, even by reducing the energy demand for infrastructure. It has been shown that medium-sized cities are

the most efficient in terms of energy consumption and are also notable for their outstanding efficiency in the field of the public transport. In cities where residential areas are close to commercial areas and public transport is well developed, individuals have much shorter distances and they can travel much easier and more efficiently, saving time and other resources.

Green cities also allow the creation of complex patterns of production and consumption, such as the fact that certain industries can use as raw materials produced in other industries to which they have very easy and quick access. In the green cities are developing the industrial clusters. This is one of the most important economic benefits of green cities, along with low congestion cost and low operating and infrastructure costs. Along with the economic benefits, green cities also offer social benefits, embodied in improving the quality of life by reducing poverty, increasing social equity and creating new jobs, many of which being green jobs in green fields. The health and environmental benefits are consisting in reducing the risks and the pollution, in improving the human health and the services of ecosystems.

Creating green cities means greening the urban sectors such as transport, buildings, energy, vegetation, landscape, water, food, waste, infrastructure, digital technology. Currently, many countries in the world are trying to respond positively, through the proposed government programs, to the 11th goal of sustainable development, which is creating the sustainable cities and communities, open to all, safe, resilient and sustainable.

The research conducted in this paper aims to show the impact of sustainable cities and the importance of their development in the world economy, given their many benefits - environmental, social and cultural.

## **2. Literature review**

“Some cities have experienced population decline in recent years. Most of these are located in the low-fertility countries of Asia and Europe where overall population sizes are stagnant or declining. Economic contraction and natural disasters have also contributed to population losses in some cities.” (United Nations Department of Economics and Social Affairs, 2018)

However, the growth rate of urbanization is particularly high in low and middle-income countries, where the authorities must focus primarily on achieving adequate management of urbanization intensification in all urban sectors. Authorities must be constantly concerned with improving the living conditions of citizens in both urban and rural areas, encouraging the strengthening of ties between them, and also seeking to improve economic, environmental and social conditions in a creative society. Given the particularly rapid pace of urbanization, the authorities need to be concerned with ensuring that all individuals have access to infrastructure and social services, focusing on the needs of disadvantaged groups.

Green cities are also called, by some authors, ecocities, these are environments in which it is desired to improve the conditions and economic, environmental and social conditions, in the long run, there is concern for the living conditions of the next generation. According to Sustainable Development Goal 11, sustainable cities are those that offer “opportunities for all through an inclusive design, as well as maintaining sustainable economic growth. The focus also includes

minimizing energy, water and food supplies and drastically reducing waste, heat production, air pollution - CO<sub>2</sub>, methane and water pollution." ([https://en.wikipedia.org/wiki/Sustainable\\_city](https://en.wikipedia.org/wiki/Sustainable_city), 2021)

The Green Cities Initiative of the Food and Agriculture Organization of the United Nations "focuses on improving the urban environment, strengthening urban-rural linkages and the resilience of urban systems, services and populations to external shocks. Ensuring access to a healthy environment and healthy diets from sustainable agri-food systems, increasing availability of green spaces through urban and peri-urban forestry, it will also contribute to climate change mitigation and adaptation and sustainable resource management." (Food and Agriculture Organization of the United Nations, 2021). Cities need to network and cooperate with each other to exchange good practices.

A topic that has been much discussed in recent years is smart cities. A smart city is "a technologically modern urban area that uses different types of electronic methods, voice activation methods and sensors to collect specific data. Information gained from that data are used to manage assets, resources and services efficiently; in return, that data is used to improve the operations across the city. This includes data collected from citizens, devices, buildings and assets that is then processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection, information systems, schools, libraries, hospitals, and other community services." ([https://en.wikipedia.org/wiki/Smart\\_city](https://en.wikipedia.org/wiki/Smart_city), 2021)

Emphasizing the importance of cities as a whole made up of individuals who form a cohesive community, the author Paul Downton launches the idea of Ecopolis. "Civilizations come and go .... That we are now living in a time of changing climate seems beyond reasonable dispute what is in question is whether it is a period of slow or rapid change. There are gradualist and catastrophist schools of thinking about the rate of change. Until the industrial era the rate of change of the built environment was relatively slow..... We have got used to the idea that our buildings, towns and cities could adapt gradually to any changes demanded of them. Much of that adoption has been in the response to human demands, often because of increasing knowledge about better ways to construct human habitat - one thinks of the changes precipitated by better understanding of sanitation, like undergrounding sewers, or the need to conserve energy, resulting in building codes that required better thermal performance." (Downton, 2009) "The global economic crisis is a crisis of civilization..... Cities may have started as human scale creations but their impact on the environment was limited only by the available technology and a pre-fossil fuel energy base. .... My Ecopolis concept of development is a response to this history. It is an attempt to return to the human scale in city making, to return to the idea of city as community, and to make the city the center of restorative activity rather than destruction, in dynamic balance within itself and with the nature of the land that supports it." (Downton, 2009)

According to the author Richard Register, ecocities are the cities of the future. They aim to reduce pollution and congestion, associated with increasing accessibility, with an emphasis on transport and the design of cities from an architectural point of view, emphasizing the role of business models and planning. Ecocities require the use of ecological principles to ensure their

long-term sustainability and the protection of biodiversity. He is one of the few authors who emphasizes that the shape of a city is of particular importance. "Cities are by far the largest creations of humanity. Designing, building and operating them has the greatest destructive impact on nature of any human activity.... Ecocities proposes a fundamentally new approach to building and living in cities, towns and villages, an approach based on solid principles from deep history and an honest assessment of a trouble future." (Register, 2006).

The author Timothy Beatley explains the concept of the new green urbanism. "Green urbanism effectively captures both the central urban and environmental dimensions. ....the important role of cities and positive urbanism in shaping more sustainable places, communities, and lifestyles..... Our old approaches to urbanism - our old views of cities, towns and communities - are incomplete - and must be substantially expanded to incorporate ecology and more ecologically responsible forms of living in settlement." (Beatley, 2000)

Recognizing the importance of green cities for the future of the sustainable economy, the European Union launched The European Green Leaf Award. "The European Green Leaf Award is presented on an annual basis by the European Commission in conjunction with the European Green Capital Award" (European Commission, 2021).

### **3. Research methodology**

Quantitative variables and graphical representations come, for the most part, from international and European Union publications on green, sustainable and smart cities. The results of the quantitative and qualitative research and analysis were based on the Reports published by the European Union and the United Nations on green and smart cities, improved energy and water consumption, measures to prevent the generation of municipal solid waste and collection and also their processing, to the wider use of renewable energy, to make more obvious progress on transport, with a focus on public transport, to the implementation of a new concept on industrial and consumer models, to improve strategies for the implementation of urbanization plans, to reduce the congestion, to raise the living standards and to use the digitalization. The qualitative research in this paper aims to show the importance of transforming our cities in sustainable or smart cities, which brings us many economic, social and environmental benefits, preserve biodiversity, improve living conditions and living standards.

### **4. Results and discussion**

The results highlighted through the research in this paper show that make cities more sustainable and smarter is an important goal because, worldwide, more than four billion people live in cities. Due to the high consumption of energy in the intense activities inside the cities, they generate about four-fifths of the world greenhouse gas emissions, but also produce about four-fifths of the global GDP on an area of only 3% of the world's land.

The most important problem concern the use of the water and energy, the waste collection and processing, the recycle of the materials, the use of renewable energies, the transport system, the industrial innovations and the consumption models, the urbanism plans, the congestion, the

living conditions and the digitalization.

The growing rate of urbanization means solving a number of problems related to the flows of goods and people, the size of cities and the transformation of some rural localities into cities.

Taking into account the increase in the size of the cities, their shape and density must be taken into account so as to reduce congestion phenomena, to increase energy efficiency, to reduce transport distances, heating and cooling costs and to reduce the energy consumption for infrastructure. In green cities are more complex models of production and consumption, there is an urban synergy.

Green cities are also an environment in which the population is more productive due to better working conditions and the intensification of the innovation process, incomes are higher and unemployment is lower, and there are more green jobs.

In green cities, community cohesion is stronger, social relations are more frequent, which is considered to have a particular impact on the physical and mental health of citizens and on increase in productivity and in economic resilience.

In a green city have to achieve the greening of each or of a large part of the urban sectors, such as transport, buildings, energy, vegetation and landscape, water, food, waste, infrastructure and digital technology.

“As the world continues to urbanize, sustainable development depends increasingly on the successful management of urban growth.” (United Nations Department of Economics and Social Affairs, 2018)

The European Commission considers that the local authorities are the key to making progress in increasing the number of green cities in the European Union. It has set up the European Green Capital Award to promote and reward greening efforts in cities and to encourage the exchange of best practices between European cities.

#### 4.1. Characteristics and benefits of the green cities

Cities are an important part of today's economy as more than a half of the world population lives in urban areas. The sustainability of the cities is necessary because, in green cities, the standard of living is higher and multiple economic, social and ecological benefits are obtained.

“Cities are hubs for ideas, commerce, culture, science, productivity, social, human and economic development. Urban planning, transport systems, water, sanitation, waste management, disaster risk reduction, access to information, education and capacity-building are all relevant issues to sustainable urban development.” (United Nations, Department of Economic and Social Affairs, 2021)

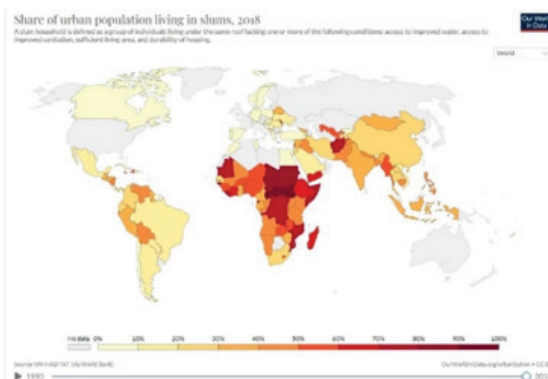
In order to increase the social effects of the process of transition to urban sustainability, it is also important how organizations manage to attract the best human capital. “Nowadays, the interest for attracting talented employees represents one of the most significant organizational goal. The talents role in the organization has been highlighted in the last decades as an important asset in creating added value to the company.” (Josan, 2020)

The 11th goal (2015) of the Sustainable Development Goals, refers to sustainable cities and

communities. The proposed targets until 2030 refer to various aspects that characterize a city, starting from its shape to the living conditions of its inhabitants. It is expected that all residents will have better living conditions, better health care, access to safe, fair and sustainable transport, public transport will be developed, with an emphasis on the needs of disadvantaged groups. The population must be empowered to live more sustainably in all respects. Environmental conditions are also improved by reducing the risk of floods or landslides, improving the quality of ecosystems, and reducing pollution. Particular attention is also paid to maintaining the natural and cultural heritage, improving urban architecture and developing spatial planning and urban planning programs linked to local, sectoral and national strategies.

The increase in the size of cities has also led to an increase in the number of informal dwellings, which affect the health and activity of their inhabitants, as well as air quality. Target 11.1 is "By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums". The highest values of the share of the population living in poor conditions in the slums, in 2018, are found in Africa, where there were percentages over 85% and even 90% in some countries, and in Asia the highest value was 70%. To address these issues, countries need to adopt national urban planning policies, which has already been achieved in more than 150 countries worldwide.

Chart 1: Share of urban population living in slums. 2018



Source: <https://ourworldindata.org/grapher/share-of-urban-population-living-in-slums>

The target 11.2 is "By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons". This form of transport refers to the fact that individuals must be able to take benefit of the public transport at a reasonable distance, it means that the low-capacity stations must not be more than 500 m and those of high capacity must be within 1 km walk.

Chart 2: Population with a public transport stop within 500 meters walking distance – in European union (2020)

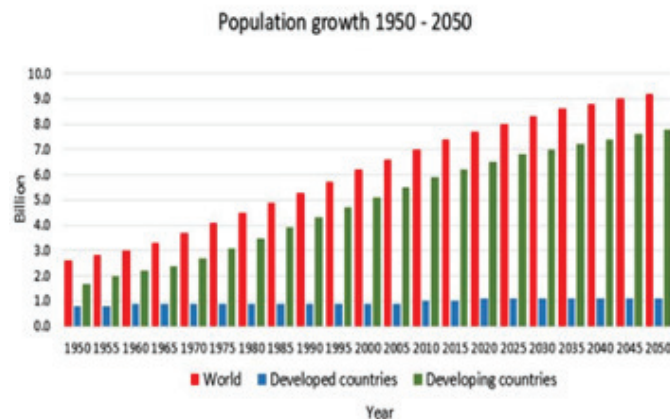




The target 11.3 is “By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries”. Achieving this goal can be studied using as indicators - the comparison, as a report, of the growth rate of land consumption with the growth rate of the population and also with the indicator showing the share of the cities that have a structure of direct participation of the civil society to the urban planning and management and which operates in a regular and democratic manner. The first indicator measures the efficiency of a city’s land use. Changes in the global population structure are becoming more pronounced. The trend shows a continuous growth in the urban population, which is estimated to reach 70% of the world average in 2050.

In this context, it is very important how they are used the additional land areas for the expansion of cities, which will have to absorb the additional population. In expanding the area of cities, it must be taken into account that they must have a certain level of optimal congestion, to ensure that the needs of the population are met as well as possible, to ensure proximity to the shopping centers, parks, cultural centers, medical services, easy access to work, but, however, this purpose must be achieved in such a way that a reasonable density per square meter is not exceeded, which would hinder the flow of goods and services. The rapid growth of the urbanization produces now a trend in some cities to expand land in an unsustainable way. In order to correct this trend, public authorities must encourage the participation of all in proposing solutions to address the issues related to the development of the city and making it more sustainable.

Chart 4: Population growth

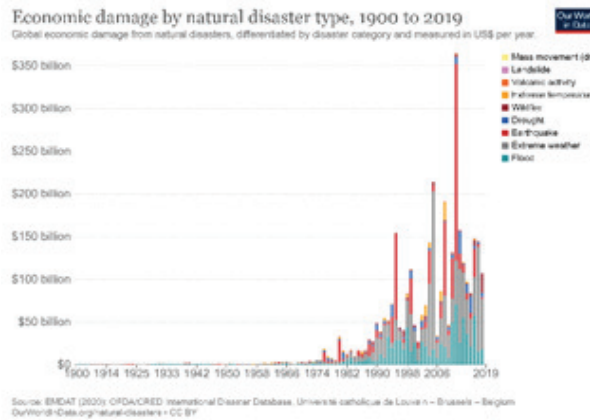


Source: <https://www.canr.msu.edu/news/feeding-the-world-in-2050-and-beyond-part-1>



addition to pandemic-related events in 2020, which was higher than the average (384) and median (390) since 2000. The estimated direct economic losses and damages caused by these natural disasters were about US\$268 billion, which was higher than the average of the 21st century by 29%” ([https://en.wikipedia.org/wiki/Sustainable\\_Development\\_Goal\\_11](https://en.wikipedia.org/wiki/Sustainable_Development_Goal_11))

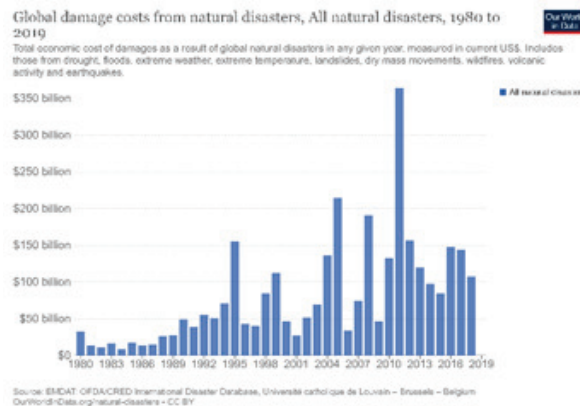
Chart 7: Economic damage by natural disaster type, 1900 to 2019



Source: <https://ourworldindata.org/grapher/economic-damage-from-natural-disasters?country=Mass+movement+%28dry%29~Landslide~>

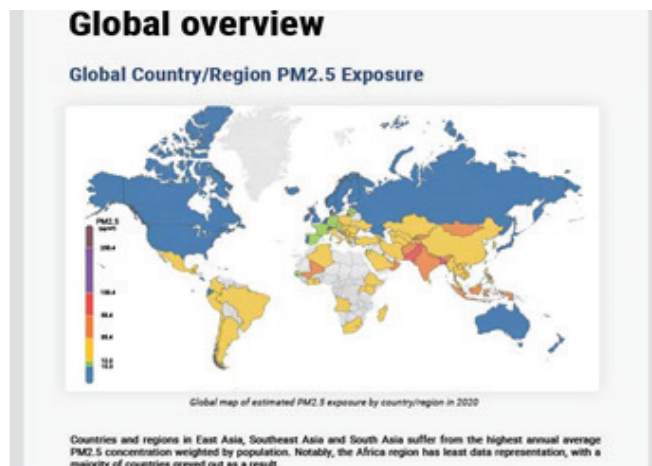
Measuring these types of damage, especially in key vulnerable sectors, is useful because the authorities can take appropriate economic policy measures. In order to determine the effects of these disasters, in general, the countries compare the damage caused by a particular disaster with its evolutionary trend and taking into account, at the same time, the number of the population and the value of the affected assets. The analysis of this indicator raises a number of issues related to the possibility of determining future trends as, for example, in the European Union, in the last 40 years, most losses from disasters caused by extreme weather and climate phenomena - about four-fifths of the total and about 3% of GDP - have been caused by less 5% of events.

Chart 8: Global damage costs from natural disasters, all natural disasters, 1980 to 2019



Target 11.6 is “By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.” This target can be evaluated, on the one hand, by the share of polluting particles in the air of cities and, on the other hand, by the measures of collection, processing and recovery of waste. Nearly 50% of the urban population suffers from an air pollution level at least 2.5 times higher than the recommended levels, affecting mainly low- and middle-income countries in the Western Pacific and Southeast Asia. The measures to be taken in the field of waste are complex measures because they cover, in addition to the economic sector, also other several sectors, such as the social, political and technological ones.

Chart 9: Global air pollution, 2020



Source: <https://www.google.com/search?q=world+most+polluted+capital+cities&tbm=isch&ved=2ahUKEwjRqYuKm e30AhVdgM4BHU00AQIQ2>

Chart 10: Integrated waste management



Source: <https://www.google.com/search?q=waste+management+in+the+urban+areas+&tbm=isch&ved=2ahUKEwiD4 JySmu30AhUByRQKHYNAAekQ2->

The target 11.7 is: “By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and Persons With Disabilities”. Authorities calculate the average share of the urban areas that are open to the public for all citizens, regardless of gender, age and disability within cities, and also by the indicators that reflect the share of the victims of physical or sexual harassment within one year.

Chart 11: Public and green spaces in the context of sustainable development



Source: <https://www.google.com/search?q=access+to+safe+and+inclusive+green+and+public+spaces&tbm=isch&ved=2ahUKEwjax66cmu30AhW4AGMBHbMIAqIQ2-cCegQI>

It is observed that, in general, over the last 30 years, the area built per person in the cities has increased worldwide, and the share of land occupied by green spaces has also been increasing - the highest values being in Australia and New Zealand - which contributes to increasing the level of general health and well-being. However, inside the cities, on world average, the area occupied by streets in the world is three times larger than that occupied by open public spaces, such as parks. (United Nation, Economic and Social Council, 2020)

#### 4.2. Sustainability and smart cities

“A smart city is a technologically modern urban area that uses different types of electronic methods, voice activation methods and sensors to collect specific data. Information gained from that data are used to manage assets, resources and services efficiently; in return, that data is used to improve the operations across the city. This includes data collected from citizens, devices, buildings and assets that is then processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection, information systems, schools, libraries, hospitals, and other community services.” ([https://en.wikipedia.org/wiki/Smart\\_city#Characteristics](https://en.wikipedia.org/wiki/Smart_city#Characteristics))

Given that the most polluting sectors are the transport industry and buildings, the focus in smart cities should be mainly on them. In industrial activities, this means ensuring the operation

and performance of real-time performance for modern operations, which requires the introduction into production of automation, artificial intelligence, robotics and industrial IoT (Internet of Things).

Because individuals spend nine-tenths of their time indoors, it's essential to use technology in this area as well. This technology refers to the use of sensors to determine the improvement of the climate inside the home and to determine patterns of behavior of residents, which can be stored so that buildings are as friendly as possible to those who live in them and as efficient as possible, from an economic and ecologic point of view.

In the field of transport, the major changes relate to the introduction of autonomous driving, which will change traditional mobility.

Smart Cities in the medical field means improving the equipment used in the medical activity, along with improving the methods of treating patients.

The use of smart technologies also aims to ensure a better life for humans and animals, including insects, so that the necessary food is provided and biodiversity is improved. These systems can record, for example, the behavioral patterns of insects in cities and ensure their contribution to increase biodiversity.

Smart cities also mean using modern technologies to analyze and optimize the way water is consumed in the city, both inside and outside buildings.

IoT devices, smart cameras, use innovative technologies, based on which, with the help of the computers, we can improve the way that cities work, we can optimize the flows of goods, services and people, we can use more efficiently all the resources, the degree of mobility increases, and thus numerous economic, ecological and social benefits are obtained for the residents. The city administration can thus receive information about the city's infrastructure and its community and provide real-time solutions. The quality, the performance and the interactivity of urban services increase, and the interactions between authorities and citizens are stronger and more efficient.

According to the "2020 Smart City Index" ranking, based on economic, technological, and citizens' perceptions of how "smart" their cities are, Singapore ranks first in implementing many smart projects in both public and private sector. Among the most important achievements, the following can be mentioned - contactless payment technology is used to facilitate traffic and payments for those who use the public transport, and the concern for the health of citizens has materialized in the use of a digital health system. It is also planned to build an eco-city with over 40,000 homes without vehicles.

In the second place, in the same top, is the city of Helsinki, where the focus has been on reducing the carbon emissions, in order to become neutral by 2035. Given that much of the emissions come from the transport and the building sectors, the measures referred to the reduction of the traffic emissions by using only electric buses for the public transport, by expanding underground subway networks and by multiplying charging stations for electric vehicles. With regard to buildings, the authorities have focused on increasing energy efficiency during renovations, which would significantly reduce emissions from buildings.

In Zurich – third place -, the first smart project was carried out in the field of street lighting with sensors, which achieved significant savings in energy consumption, by adapting the light intensity to the traffic. The sensors also collect environmental data, measure traffic flow and act

as public WiFi antennas. A very high efficiency was also recorded for the energy consumption for regulating the temperature inside the buildings.

The fourth smart city, Oslo, aims to run only electric cars and buses by 2025, and the authorities encourage this by incentives for zero-emission cars, free parking, lower taxes. There are projects for zero-emission construction sites and circular waste management and green energy systems are used in the field of buildings.

In fifth place is the first smart city in the world - Amsterdam, in the Netherlands. Some of his projects in this field are the introduction of energy meters in households that brings benefits to those who constantly reduce their energy consumption, the possibility that individuals who have a parking place to rent it, which helps to calculate the total demand for parking places, as well as the possibility to automatically adjust the intensity of street lights according to the intensity of traffic. There are floating areas in Amsterdam for more efficient land use and to combat overcrowding.

In on the 6th and 7th places, there are, in this order, New York and Seoul. In New York sensors have been installed that collect data for more efficient waste collection management, smart hubs with contactless technology have been put into operation, and car-sharing services are widely used. In Seoul, the main initiatives concern the collection of data for the analysis of urban patterns of the traffic flow, of the air quality and of the potential crime patterns. For elderly people living alone, the sensors monitor if there is movement in a period of time, in order to intervene urgently, if necessary.

Other examples of Smart projects in cities around the world are listed below. In the Spanish city of Barcelona, smart technologies are also being introduced in various fields. A first example is the installation of the sensors for gardening in an important park of the city, which transmit, in real time, the water needs of the plants in the park. The bus network has been redesigned according to the transport needs, and the city benefits from intelligent traffic lights, which are used to optimize the traffic and the transport time and can be managed at the central level of the city, through a specialized platform.

In Brisbane, Australia, devices have been installed on the poles to continuously measure air quality and noise pollution, and in Columbus, Ohio, USA, in order to encourage the purchase and use of electric vehicles, the possibilities of finding the routes with the highest traffic were analyzed, as well as the installation of several charging stations for electric cars on these routes.

In the city of Copenhagen, Denmark, which won the award for the smartest city in the world in 2014, there are installed sensors to monitor air quality and there are encouraged open and transparent public-private partnerships, the communication and the desire of all the economic subjects to use their knowledge in order to solve the problems of the citizens and the city, as a whole.

In Dubai, most government services on transportation, communications, infrastructure, electricity, economic services and urban planning are digitized, making significant savings. An artificial intelligence system is used to monitor bus drivers, which has greatly reduced traffic accidents caused by fatigue.

#### **4.3. The transition to the sustainable cities in the European Union**

At the level of the European Union, the European Green Deal stipulates that by 2050, Europe will be climate neutral. To do this, by 2030, net greenhouse gas emissions must reach less than

half of the level reached in 1990, targeting all economic sectors.

The European Commission has set as objectives, based also on a public consultation on the views of stakeholders and citizens, which are included in the fiscal macroeconomic policy measures and are adapted to the local context

- “Set a more ambitious and cost-effective way to achieve climate neutrality by 2050
- Stimulate green job creation and continue EU balance sheet to reduce greenhouse gas emissions as economy grows
- Encourages international partners to increase their ambition to limit global warming to 1.5 ° C and avoid the worst consequences of climate change” (European Commission, 2021)

The strategy for protecting and restoring biodiversity has as its main objective to increase resilience to future threats, such as

- “the impacts of climate change
- forest fires
- food insecurity
- disease outbreaks - including by protecting wildlife and fighting illegal wildlife trade” (European Commission, 2021)

In order to stop the degradation of the biodiversity, to reduce the consumption of resources per unit of product or service achieved, to have a sustainable economic growth, a sustainable consumption and to create new green jobs, the European Union promotes the circular economy.

The European Commission intends, in order to increase energy efficiency, to increase the share of the energy produced from renewable sources, of which wind energy is of a particular importance, taking into account the favorable natural conditions, along with solar energy. Progress would not have been possible without the expansion of a modern energy network, with more connections, but it is also important to change the production methods so that less energy is consumed and products have an eco-friendly, sustainable design. In order to achieve this transformation and better meet the new challenges, the attitude of leaders at all levels is particularly important. “The attitude of the management, expressed concretely by the activity of the leaders on different hierarchical levels, comes to maintain and influence the performances of the organization, to support the dynamics of the change processes and to help, in this way, to design and achieve the strategic vision.” (Bolcaş, 2020)

As the European Union has already made significant progress in the field of sustainable agriculture, the focus is now on the transition to a sustainable food system, given the close link between agriculture and food and the multiple benefits, not only economic, but also environmental and social.

“The EU’s goals are

- to ensure food security in the face of climate change and biodiversity loss
- reduce the environmental and climate footprint of the EU food system
- strengthen the EU food system’s resilience
- lead a global transition towards competitive sustainability from farm to fork” (European Commission, 2021)

The European Union industry needs to demonstrate that it is successfully facing global competition, taking into account the proposed zero carbon targets for 2050. The gradual transformation



of the industry into a green and digital one is the use of cleaner technologies in production and the creation and implementation on a larger scale of new business models.

The transport sector is a key source for the European economy, accounting for 5% of European Union GDP and providing about 10 million jobs, but it also has costs - greenhouse gas emissions and pollutants, noise, road accidents and congestion.

Reducing greenhouse gas emissions requires major changes in transportation.

“The EU Cohesion Policy helps EU countries, regions, local governments and cities to implement large investments that contribute to the European Green Deal. They must devote at least 30% of what they receive from the European Regional Development Fund to these priorities. In addition, 37% of the Cohesion Fund will contribute specifically to achieving climate neutrality by 2050.” The measure provides for the involvement of both public and private sectors in the financing of green investments and the development of the research and innovation process. (European Commission, 2021)

At the level of the European Union, local authorities are considered to be the most important in creating as many green cities as possible on their own territory. The European Green Capital Award is a reward for cities that have implemented the principles of a sustainable economy and also aims to encourage the exchange of good practice between European cities.

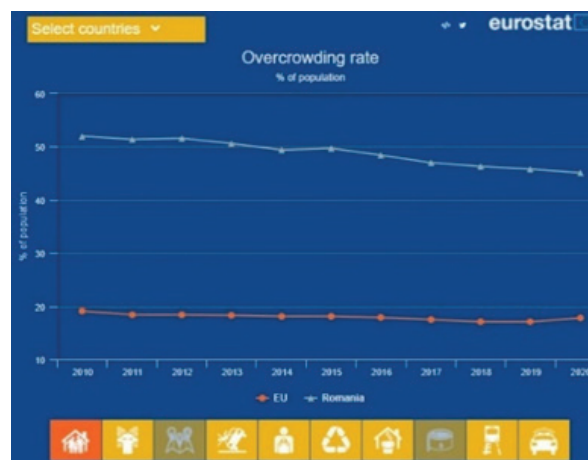
The European Union has implemented a number of economic policy measures, in particular on urban planning and financing. Local authorities are encouraged to use urban nature to improve the quality of life and better adapt to climate change. promoting the circus economy is the key to making cities more sustainable. local authorities are also encouraged to make green, innovative and responsible public procurement.

In the list of the 100 green cities in the world, in 2019, there is also a city in Romania, namely Alba Iulia, recognized for its achievements in the field of renewable energy. This city uses over 95% hydroelectric energy, the rest being solar energy, wind energy and natural gas energy.

The achievements of the last decades at the level of the entire European Union, compared to the progress achieved in Romania, regarding the most important objectives in the transition to green, sustainable, sustainable, smart cities, can be observed in the graphs below:

- reducing the overcrowding rate

Chart 12: Overcrowding rate



Source: <https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities>

- noise reduction affecting the population

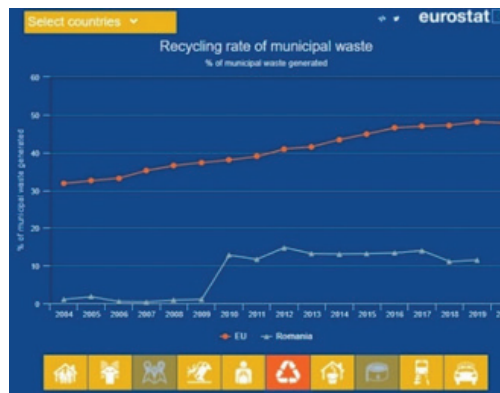
Chart 13: Population living in households suffering from noise



Source: <https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities>

- improving the recycling rate of municipal waste

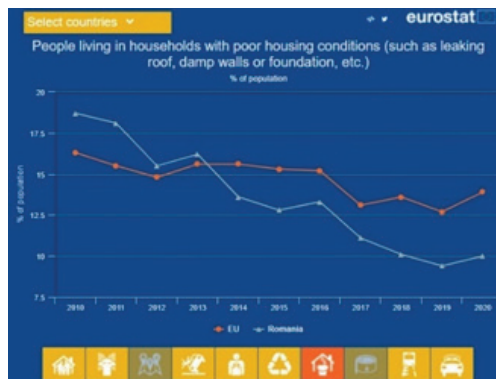
Chart 14: Recycling rate of municipal waste



Source: <https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities>

- improving living conditions

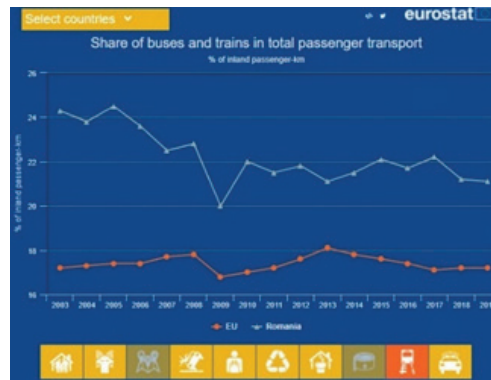
Chart 15: People living in households with poor conditions



Source: <https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities>

- the evolution of public transport

Chart 16: Share of busses and trains in total passenger transport



Source: <https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities>

## 5. Conclusions

This article is in line with previous research. Nowadays, the importance of green cities stems both from the fact that a significant increase in urbanization is expected. It is therefore essential that the standard of living in cities and the conditions they offer in all areas are as good and sustainable as possible. Green cities have a lower impact on the environment, promote social equity, equal opportunities, focus on quality of life, there are more research centers, which collaborate with universities and other interested economic actors, so the degree of innovation is more high productivity and higher productivity, all of which lead to a reduction in costs and an increase in profits.

Providing access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, expanding public transport, with special attention to the needs of those in vulnerable situations, requires the authorities implement infrastructure and transport policies, so that people have quick access to the stations, close to their homes and benefit from green means of transport.

In expanding the area of cities, it must be taken into account that they must have a certain level of optimal congestion, so that satisfy as best as possible the needs of the individuals, to ensure proximity to the shopping centers, parks, cultural centers, medical services, easy access to work, but, on the other hand, the congestion must not exceed a certain density per square meter, so it must not become an obstacle to the development of the economic and social activities.

From the local to the national level, the authorities must direct their expenses from public and private funds, in order to protect the cultural and natural heritage. Authorities must also take appropriate economic policy measures to determine possible natural disasters and not only, that may affect cities and to reduce their effects.

The measures to be taken in the field of noise, air pollution and waste are complex measures because they cover, in addition to the economic sector, also other several sectors, such as the social, political and technological ones. Another important target is related on the built area per person in the cities, which has increased worldwide, so as the share of land occupied by green

spaces, which contributes to increasing the level of general health and well-being.

Digitization is also important to make cities more sustainable. The cities that use it extensively to measure different phenomena are called smart cities. They are using the latest modern technology to collect specific data. The data collected from other economic subjects is used by the authorities in order to improve the use of the resources and all operations within the city.

According to "2020 Smart City Index", in the top of the Smart cities in 2020, there were Singapore, Helsinki, Zurich, Oslo, Amsterdam, New York, Seoul.

In the European Green Deal, there are included measures to improve climatic conditions, preserve biodiversity, reduce energy consumption, improve transport, create new production models in industry and agriculture, improve consumption patterns, improve living conditions, reduce air pollution and noise pollution, recycling municipal waste. The European Union has implemented a number of economic policy measures, in particular on urban planning and financing. Local authorities are encouraged to use urban nature to improve the quality of life and better adapt to climate change, and to promote the circular economy is the key to making cities more sustainable. Local authorities are also encouraged to make green, innovative and responsible public procurement.

"To ensure that the benefits of urbanization are fully shared and inclusive, policies to manage urban growth need to ensure access to infrastructure and social services for all, focusing on the needs of the urban poor and other vulnerable groups for housing, education, health care, decent work and a safe environment." (United Nations Department of Economics and Social Affairs, 2018)

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