MARATIMBA SUSTAINABILITY IN COMPARATIVE ANALYSIS WITH THE 10 EXAMPLE CITIES ON A GLOBAL SCALE

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ABSTRACT

This article aims at a comparative analysis between the characteristics of the city of Marataízes, which is located on the coast of Espírito Santo, with the 10 cities considered the most sustainable and intelligent in the world. They are: Tokyo, London, New York, Paris, Geneva, Osaka, Seoul, Frankfurt, Oslo, Sydney. Curitiba is the featured city in Brazil when it comes to sustainability, based on a bibliographic inspection it was possible to verify the advances and challenges that Marataízes faces in relation to these cities such as economic growth, quality education, land life, urban mobility and zero hunger with sustainable agriculture. Great action that the city Maratimba has is to ensure the preservation of its beaches, lagoons, mangroves and fishing, as they are part that makes it known touristically and economically, however it is important to invest in new technologies aimed at the urban and rural sphere, and in public policies to adopt strategic and effective measures to improve the city's classification in the SDG index (development and sustainability goals) so far it is considered medium.

Keywords: Sustainability. City. Preservation. Investment. Public policies.

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INTRODUCTION

Sustainability is the need to see occurrences that may compromise future generations; that is, to have the ability to understand the demand for adequate and conscious use of natural, environmental **and** social resources, in a totalitarian context (MAULEN; MARINHO; ELEROVIC, 2019).

On the planet, the lack of sustainability of one place reaches the other. Thus, it is important to compare cities, whether municipal, state, national or international, so that there is an evaluation of good practices, innovations, recognition of problems, attraction of investments and review of public policies, aiming to reach new times.

In this context, the sustainable development goal is directly linked to the 2030 Agenda, where, in 2015, the United Nations (UN) General Assembly established the seventeen measures in favor of global development by the year 2030. As described in the preamble of its document, the realization of such an agenda will only take place with the adequacy of the countries and parties involved.

The growing advances of cities make urban planning constantly outdated, since changes occur in a slight and accelerated way. Throughout this growth, population obstacles, sustainability of natural resources, and insufficient waste management arise. Urban development is an unprecedented fact around the world and cities need to be prepared to receive such advancement.

DEVELOPMENT

THE 10 SMARTEST AND MOST SUSTAINABLE CITIES IN THE WORLD

First of all, there is the large city of Tokyo (Japan), a smart city that uses all its technology depending on its population, in which it has the most impressive garbage collection in the world, where people can leave their waste in the baskets and their homes, which will be separated and collected properly. There are sensors scattered throughout the city so that energy consumption is monitored, and also air quality. They apply the culture of innovation, where they encourage the creativity of their young people and, therefore, receive and value constant ideas for solutions to problems and challenges in their city.

The second best-placed city when it comes to sustainability is London (England), presenting an innovative form of public transport. It contains a metro system that connects the entire city, providing compatible bicycles and demonstrates to the world its great innovative intention to become the first carbon-free city by the year 2050. New York, in the United States, is in the third position in the ranking of this survey, presenting to the world its quality system in public transport, well-structured recycling and investments in renewable

energy, which is one of the needs for a city to be considered sustainable (PEREIRA; SIMPLICIO; DONAD, 2019).

Paris (France), with its stunning beauty, is highlighted not only for its culture, but for the appreciation of the planting of trees on its avenues, which contributes to air circulation, thus solving the process of verticalization resulting from the foundation of many buildings (MAULEN, I.; MARINHO, C.; ELEROVIC, J., 2019). This city also has efficient transportation, with the implementation of several subways, trains and bike racks, thus reducing the use of fuel and traffic, adequate recycling, composting and encouraging the empowerment of electric cars on its streets.

Geneva (Switzerland), also known for being the European headquarters of the UN, where the United Nations office opened, is highlighted for its various bike lanes, contributing to the population, offering shared bicycles for well-being, promoting health and reducing carbon monoxide gas, in addition to its very efficient recycling program. Many materials, such as aluminum, can be recycled with a 400% reuse level, melted, it returns to the production lines of the packaging industries, reducing costs for companies (FONSECA, Lúcia Helena Araújo, 2013, p. 3).

Osaka, as the sixth runner-up, presents its successful electric bus project, which balances environmental protection and economic growth. They also use their streets and avenues for shared bicycles, garbage collection through sensors, encouragement of the so-called "Smart Community Forum" and the implementation of parks and gardens. These places tend to promote a healthy lifestyle for the entire community (SEIAS, E.; SEIXAS, P.; LOPES, J., 2023).

The city of Seoul (South Korea), known worldwide today through dramas, Korean series that have gained prominence in several countries, features smart street lighting by sensors, virtual medical care preventing patients from leaving their homes, surveillance cameras with facial identification, taxis with robot drivers, electric buses and subways, and all this is revealed, including through his teledramas to the whole world. Frankfurt, Germany, bets on electricity for public transport, such as buses, subways and cars, and also invests in sustainable buildings and the use of renewable energy. It is essential that the sustainable city presents a development plan prioritizing its resources and aiming to prolong the life of its citizens (STEFANI; CORREA; PROCIDONIO, 2022).

Oslo (Norway), on the other hand, is primarily known for its museums and green areas. It is a city concerned with the environment, seeks to reduce pollution, as it aims at the well-being of its population. Some of its actions to achieve the goal are smart street lighting, boats powered by renewable energy, sustainable public transport, shared bicycles

and the implementation of parks. Urban gardens and parks are the spaces that most promote the human-nature connection (VIDAL; GEORGE; BARROS; MARIA, 2020).

The tenth place is the city of Sydney, Australia, owner of one of the largest natural ports in the world, which presents its transport system with ferries that cross the entire city, a precious project for reducing CO_2 carbon emissions, green buildings and solar energy. The deployment of solar energy is known as the use of clean energy, and its demand is higher than the global demand for electricity. Studies point to a growing increase in the share of this energy source on a global scale (BEZERRA, Francisco Diniz, 2021).

SUSTAINABLE FEATURED CITY IN BRAZIL

In 2023, the Brazilian city of Curitiba, capital of the State of Paraná, received the smart city award in Spain, thus becoming known worldwide. Some of its highlights are the treatment of the water and sewage network, electric buses, solar roofs and, currently, half of the public buildings are supplied by 8,500 solar panels. Around 1996, the population rate of the city of Curitiba was around 400 thousand people, making it necessary to have a project to support the growth of the city and, therefore, an urban expansion. During this period, a comprehensive vision was initiated where the circulation of citizens was considered, whether for work, recreation or housing. This whole revolution has always been surrounded by a population with the environmental issue, which is not only materialized in the preservation of greenery, but also in the environmental education of its population.

Curitiba then began to create its sustainable city with the implementation of avenues, economic transformation projects, flood prevention and equitable access to public services. One point that attracts attention is that this city took the initiative to bring together in the same place its sectors of public service to the population (regional administrations of the municipality).

Curitiba is based on a structure called the basic tripod, which is defined as its model of urban expansion, which is subdivided into three points. They are: legislation, soil and transport. But it was at the end of the 80s that the city acquired the projection of an ecological city, and its entire population has since received all its projects as a daily action. Parts were created in various regions of the city, which assumed an important role in confronting and reducing polluting gases that increase global warming, in addition to the implementation of bike lanes on their roads. The use of bicycles as transport is evaluated in a sustainable way for the environment and also as a modality that offers physical and mental health to its fans. In addition to having flexibility, it occupies less space on the streets

and for storage, has low maintenance costs compared to other transports and does not offer pollution (MIRANDA; VIEIRA, 2019). It is worth mentioning that:

> It is important to always remember that the city is built continuously and in each citizen. Public interventions, then, find meaning when the population appropriates them, incorporating them into their daily lives, which is a fundamental condition for the harmonious development of the city over time. (SEQUINEL, Maria Carmem Mattana, 2002, p. 54).

SUSTAINABILITY IN CITIES OR URBAN SUSTAINABILITY

Urbanization is at an increasing level. Increasingly, energy consumption, for example, will increase, as well as CO2 emissions, which are largely responsible for the increase in temperatures on the planet, which leads to a great environmental imbalance. Therefore, it is necessary that containment measures be carried out. Among the various positions is the implementation of policies aimed at the sustainable issue, which can assertively link the economy with society and the environment (MAULEN; MARINE; ETEROVIC, 2019).

Every change requires the creation of a new operating logistics. Therefore, each stage of a sustainable urbanization project needs to be thoroughly planned and worked on with the awareness that every project aimed at sustainability needs to be prepared for long-term action, as they are not quick projects.

In the same way, sustainability aims, above all, at the quality of human life, prioritizing the evolution of its means aimed at improving its services for the full use and development of its population. It is the right of the individual to basic sanitation, safe transportation, drinking water, clean air and safety. Public policies must work according to these particularities, improving strategies for such services to be offered, safeguarding all environmental practices through short, medium and long-term sustainable measures. It is at this point that the critical and scientific debate can accompany and boost the commitment of cities to the evolution of sustainability in its various aspects (BOTTON; PINE; OLIVE TREE; LOPES, 2021).

THE 17 SDGS AND THE MARATIMBA CLASSIFICATION.

The Global Compact was established 24 years ago and since then it has proven effective in its objectives and adopted measures. The United Nations has adopted such measures so that economic growth is valued, prioritizing the common good of the planet and its inhabitants. Before the Sustainable Development Goals were described, 10 principles were implemented in the Global Compact. They are: Respect and support for human rights at the international level; monitor companies to ensure that they do not violate rights; Freedom of collective bargaining; Eradication of forced labor; Total abolition of child

labor; Elimination of all forms of discrimination in the employment environment; Environmental preventive approach; Initiatives that promote accountability; Encouraging the sustainable diffusion of technology and fighting corruption in a totalitarian way.

After certain measures, the 17 SDGs appear in the 2030 agenda to add their objectives to the Global Compact (COUTINHO, JEANDO DE MATOS. Dec 2021,

p. 503. 508). Such objectives are the result of more than two years of public research, a decision made by major representatives of governments and states.

Because much is not said, it is that a city to become sustainable, not only needs to prioritize the environment, but also fight for inclusion, equality, justice, safety and protection, that is, prioritizing human rights and environmental preservation will become a graceful consequence. The 17 SDGs are: Eradicate poverty; Eradicate hunger Quality health; Quality education Gender equality; Drinking water and sanitation; Renewable and affordable energy; Decent work and economic growth; Industry, innovation and infrastructure; Reduce inequalities; Cities and communities; Sustainable production and consumption Climate action Protecting marine life; Protect life; Peace, justice and institutions and Partnerships for the implementation of the goals.

Within this context, the cities of Marataízes are classified at the level of medium sustainable development. The maximum score is 100, while the city points to 53.34 and its overall rating is 780 out of a total of 5,570.

Based on an assumption between very high, high, medium, low and very low classification, the city of Marataízes points out the need for improvements in several sectors such as poverty eradication, quality of education offered to citizens, dignity at work and development of its economy, sustainability of consumption, production, eradication of hunger and sustainable community. Representing a fully alarming situation are the SDGs in very low classification, represented by the Institute of Sustainable Cities by the color red. They are: gender equality, industry, innovation and infrastructure, protection of life on land, peace, justice and effective institutions, and also partnerships for the implementation of the objectives (IDSC-BR).

It is believed that the creation of the so-called Public Policies can become a compass in search of effective results, recognizing and guiding positive actions to achieve and develop changes. As seen in a comparative analysis with the 10 smartest and most sustainable cities in the world, added to Curitiba – PR, Marataízes has a lot to develop, but it has in its characteristics important points as in other countries (Paris, Geneva, France), its culture makes it known for its beautiful beaches and lagoons (Lagoa do Siri, Praia de Boa vista do Sul, Centro Areia Preta, Falésia, Praia das Rosas, Micinho and Pitas Gomes), are

some examples, with summer being the season of greatest economic movement for receiving tourists from several other cities in Brazil and the world. Economic development is one of the indicative factors in the recognition of urban growth and the need for improvements in the city's infrastructure (STEFANI, PROCIDONIO RAIFUS and CHÍUSOLI, 2023).

As it was found, several cities (London, New York, Oslo, Frankfurt) have urban conditions favorable to the population and sustainability. They are mirrors for the city of Maratimba: electric buses, the creation of subways using reusable energy, which stimulates public transport, public bike racks that, in addition to doing good to the health of the planet by not producing carbon monoxide, reduce traffic on the Avenues, generating agility and reducing accident rates. As well as Seoul (South Korea) use public lighting by sensors and with LED lamps, as they are recyclable, which also helps to reduce carbon emissions (MAULEN, MARINHO, ETEROVIC, 2019).

Quality education is part of sustainable planning, through which it is possible to work on good environmental education.

In Marataízes, an award entitled "environmental sustainability of water resources in Marataízes" has been taking place since 2016, it is an event designed in partnership between the Municipal Department of the Environment and the Municipal Department of Education, where students receive prizes in categories such as children's drawing, poetry and even environmental letters (O Jornal Online, 2023).

Many cities have implemented parks, gardens and commas tree-lined avenues (Osaka, Sydney), and Marataízes can be mirrored by developing reforestation, sustainable agriculture, protection of endangered animal species and conservation of their ecosystem, since the most prominent product in the municipality is the pineapple "Sweet, Sweet as Honey", there could be incentive programs to partner with farmers offering a line of credit for access and proper use of equipment in the soil irrigation without wasting water and support for the use of organic fertilizers (VILELA, BENTES, OLIVEIRA, MARQUES, SILVA, 2020).

Citing ecosystem, as well as, the city of Marataízes is located on the coast of Espírito Santo, and has a vast aquatic area, which also moves the city's economy through fishing. In February 2024, the magazine Caderno Pedagógico published an article mentioning the environmental effects caused by fishing waste in the city of Maratimba, and unfortunately the municipality has not yet created an infrastructure for proper waste disposal and informative education aimed at fishermen, this being the justification of the observed workers (ABREU, 2020).

To conclude this article of the literature review, it is notable to transcribe renewable energy, better known as clean energy.

Curitiba stands out in Brazil in sustainability, and its investment tool in this sector is solar energy, where in its city it is even used to supply energy to its public buildings. Solar energy, a natural source, is inexhaustible with a low acquisition cost (FERREIRA, COSTA. 2021).

Such points, therefore, show the city of Marataízes a comprehensive and effective need for analysis in its classification in the sustainable objectives towards the fulfillment of the 2030 Agenda.

FINAL CONSIDERATIONS

In summary, education for sustainable development in the city of Marataízes emerges with an ethical and moral imperative in the face of the environmental and social challenges it faces.

Sustainability is a principle that aims to balance the exploitation of natural resources with the preservation of the environment and the quality of life of the population. Environmental sustainability, for example, seeks that human activities respect the limits of nature and enable its ability to regenerate. From the reflections, it is possible to envision a path to the construction of a more equitable, just and sustainable city.

Marataízes, has adopted initiatives to promote sustainability in several areas, such as artisanal fishing, architecture and the environment: Water is life program, where the Municipality of Marataízes participated in a contest in the Sustainable Municipalities category with the "water is life" program, from the Department of Environment, Fishing registration booklets, the city distributed booklets to the

fishermen to record their catches. The objective is to monitor and control fishing activity, in addition to facilitating access to public policies and social benefits and the Sustainable Residence Architectural Project.

Finally, it is important to calculate the environmental impact of each action and reduce it. Some sustainable actions that can be adopted are: reuse of environmental resources, such as selective collection, use of non-polluting means of transport, among others to contribute to the sustainability of the municipality.

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