Sustainable Urban Development in Venezuela: A Management and Economic Perspective

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ABSTRACT

Sustainable development, which is defined by the United Nations through 17 goals, provides a shared blueprint for achieving peace, prosperity, and environmental well-being. Various urban projects worldwide aim to align with these sustainable goals and incorporate them into their design language. Stockholm Royal Seaport stands out as one of the largest sustainable urban developments, striving to become an international model for urban planning. Within the Stockholm Royal Seaport project, the sustainable development goals have been translated into five key strategies including vibrant city, accessibility and proximity, resource efficiency and climate responsibility, let nature do the work and participation and consultation. Here the question is whether the sustainability model works the same for developing countries. To answer, we have selected four projects in Caracas, Venezuela to compare their sustainability model with the base one from Stockholm Royal Seaport. The comparison reveals that the significance of each strategy varies in Venezuela, with some strategies being more prioritized than others. Additionally, two additional strategies, namely education and limited demolition, emerge as noteworthy and exclusive to Venezuela. By exploring these findings, we gain insights into the adaptation and customization of sustainability models in developing countries, shedding light on their unique economic and managerial perspectives.

Keywords: Design strategies, economic perspectives, strategic management, sustainable development.

I. INTRODUCTION

In recent years, sustainability has gained significant attention, leading scholars to present various definitions of the concept. For example, one of the first definitions of sustainable development emerged as a concept in 1987 in the publication of the Brundtland Report. This report highlighted the negative environmental consequences arising from economic development and globalization (De la Vega et al., 2019). Sustainable development, as defined in this context, refers to the ability to meet the needs of the present generation by utilizing natural resources without compromising their availability for future generations (Zemigala, 2019). A more recent definition of sustainable development is the Quintuple Helix Innovation Model (Carayannis et al., 2012). This model emphasizes the interconnectedness of five key stakeholders, or "helices," which include academia, government, industry, civil society, and the environment. The success of a country in achieving sustainable development is determined by its ability to integrate and coordinate the dynamic capabilities of these helices through the exchange and circulation of knowledge (Carayannis et al., 2012). In some cases, the definition of sustainability has focused more on one aspect such as energy efficiency (Arjomandnia et al., 2023; Kazemidemneh & Mahdavinejad, 2018). Kazemidemneh and Mahdavinejad focused on energy efficiency in urban areas using space syntax method. Another definition has been proposed by the United Nations, and it has defined sustainability into 17 goals to provide a shared blueprint for peace and prosperity for people and the planet, now and into the future (UN, n.d.). Each of these goals focuses on one aspect of human needs, such as good health and well-being, poverty reduction, sustainable cities and communities, and economic growth.

The importance of achieving sustainable development in developing countries can be understood by referring to the definition of sustainability itself. It is assumed that sustainable development is an improvement in the environment and the quality of life of people without endangering the sustenance for the survival of future generations and the planet (De la Vega et al., 2019). This perspective highlights the responsibility we have towards natural resources and the need to consider the ability of future generations to access those resources. Consequently, sustainability is crucial for all communities, regardless of whether they are in developed or developing countries. Furthermore, the United Nations emphasizes addressing fundamental human needs, therefore, here the focus shifts more towards developing countries, as they often face challenges in fulfilling their immediate needs. For instance, the first Sustainable Development Goal set by the United Nations is to eradicate poverty, and statistics indicate that the poverty rate in Venezuela stands at approximately 43% in 2005 (Weisbrot et al., 2006). Consequently, tackling poverty becomes a pressing priority in such contexts. Another example can be seen in Caracas, where a significant portion...
of the population resides in slums with limited access to basic infrastructure such as clean water, sanitation, and electricity.

The sustainable development model proposed by the United Nations takes into consideration the economic aspects alongside the needs and quality of life, making it a crucial framework for developing countries. In these contexts, economic considerations play a vital role in prioritizing goals and managerial strategies. However, it is important to note that the relative importance of each goal may differ from that of developed countries due to the specific economic challenges faced by developing nations. Governments and planners, as key stakeholders with the authority to influence communities and develop strategies, should prioritize goals that address both the immediate needs of the people and the economic realities of the country. By aligning sustainable development with economic considerations, developing countries can foster inclusive growth, create employment opportunities, and enhance their economic resilience while pursuing environmental well-being and social progress.

II. TRANSLATE SUSTAINABILITY INTO DESIGN LANGUAGE

The aim of the sustainable development goals proposed by the United Nations is to improve the quality of life for all people. Architects and urban designers have a significant responsibility to integrate and address sustainable development goals in their work, particularly in developing countries. By prioritizing sustainability in their designs, they can minimize government costs and maximize the utility of people in the country. Sustainable urban projects can lead to cost savings by reducing infrastructure investments, optimizing energy consumption, and promoting sustainable transportation. Moreover, creating accessible and inclusive spaces improves the well-being of citizens and enhances the livability of cities. Sustainable designs also stimulate economic growth through job creation, support for local industries, and eco-tourism. Consequently, it becomes essential to translate these goals into a design language that informs architectural practices. Stockholm Royal Seaport is among the largest urban development projects in Sweden with a sustainable perspective (SRS report, 2017). Within this project, the 17 SDGs have been translated into five distinct design strategies, each strategy encompassing specific aspects of the sustainable goals. “First, a vibrant city focuses on how the physical environment promotes a dynamic, attractive urban environment. Second, accessibility and proximity refer to a dense and accessible city, where third, effective long-term solutions contribute to resource efficiency and climate responsibility. Fourth, let nature do the work describes how greenery can help to create a robust and pleasant environment, while also fulfilling several other functions. Lastly, participation and consultation stimulate motivation and a connection with the place” (SRS, 2019). For example, a study revealed that the influence of accessibility, land use, safety, comfort, facilities, services, and landscape on the environmental quality of urban spaces results in heightened levels of social capital, social participation, and social trust. (Rahnana & Mohamadzadeh, 2014). Kazemidemneh has effectively applied these strategies by translating them into a lighting language, resulting in the development of sustainable lighting strategies. (Kazemidemneh, 2020). Fig. 1 shows the five sustainable strategies retrieved from Stockholm Royal Seaport.

By adopting these strategies, architects and urban planners can effectively contribute to achieving sustainable development goals in developing countries. Through a thoughtful integration of design elements and sustainable practices, they can positively impact the quality of life for individuals while considering the broader environmental and social aspects. The model presented here considers the five sustainable strategies as equally important. However, to assess the applicability of these strategies in Venezuela as a developing country, we have examined four projects within Caracas. The objective is to determine which aspects of these strategies hold greater significance and identify any additional economic and managerial goals that shape the concept of sustainability in Venezuela. By conducting this analysis, we aim to understand the unique factors influencing sustainability and prioritize strategies that align with the country’s economic and managerial needs.

III. SUSTAINABILITY MODEL IN VENEZUELA

Venezuela, located on the northern coast of South America, has a population of approximately 28 million people. It stands out as one of the most urbanized nations in Latin America, with over 90% of its population residing in urban areas, particularly in the capital city of Caracas. However, Venezuela faces a multitude of challenges including severe hyperinflation, scarcities of essential goods, high unemployment rates, widespread poverty, prevalent diseases, high child mortality, malnutrition, and systemic corruption. The country also grapples with a high crime rate, with a staggering occurrence of one murder every 21 minutes. Distressingly, over 43% of the population lives below the poverty line, leading to the proliferation of slums and informal settlements (Weisbrot et al., 2006).
To address these pressing issues, reducing the poverty rate, generating employment opportunities, and improving the overall economic situation are crucial imperatives. Additionally, the lack of adequate infrastructure, such as access to clean water and sanitation, poses significant challenges, particularly in impoverished urban areas and slums. Overcoming these hurdles and improving the quality of life for Venezuelan citizens necessitates comprehensive and sustainable solutions that tackle both the social and infrastructural aspects of urban development.

**Torre David, Caracas, Venezuela**

Torre David, formerly referred to as the Centro Financiero Confinanzas, is a 45-story tower in Caracas, Venezuela. However, this architectural project remains incomplete and has been abandoned since the death of its developer, David Brillembourg, in 1993. Furthermore, the financial group that initially supported the construction faced significant setbacks following the 1994 Venezuelan banking crisis (Brillembourg & Klumpner, 2013). The initial design contains five buildings, including a parking garage, atrium, apartments, and the main 45-story commercial-residential tower. The first six floors of the high-rise (known as Torre David) were to house hotel support services, while floors 7-16 were intended for a hotel; floors 18-45 were planned for 30,000 m² of office space (Brillembourg & Klumpner, 2013). The construction of Torre David primarily utilized materials such as concrete, aluminum, and glass walls.

The building was empty for 13 years after it was abandoned but was finally occupied in 2007 by 750 families. Residents have occupied the building up through the 28th floor. Situated in a central location in Caracas, the high-rise enjoys convenient access to the city’s public transportation systems, including the metro. Despite repeated requests from the government to evacuate the building and offers of alternative housing options with improved amenities, the residents have resisted relocation. This resistance stems from the advantageous proximity to the public transportation system.

The residents recognize that being in close proximity to the metro affords them better employment opportunities, even though it entails climbing 28 flights of stairs to reach their homes (Brillembourg & Klumpner, 2013).

Despite the insecurity of their habitation, the residents of Torre David exhibit resilience by continually adapting their spaces to meet community needs and strive for an improved standard of living. In most cases, these modifications are in the same line with the sustainable strategies presented by Stockholm Royal Seaport. For instance, communal spaces for gathering and socializing have been created. Additionally, a church on the ground floor serves as a unifying place for the residents, despite the presence of another nearby church. Furthermore, on the 28th floor, they have created a small gym and a balcony facing northwest for socializing (Etherington, 2012). Residents have also transformed the ground floor by repurposing it into a basketball court, employing modifications such as painting columns and adorning walls with vibrant symbols. The stairs, serving as the primary vertical circulation, have become informal meeting spots. Moreover, efforts have been made to enhance the comfort and welcoming atmosphere of public spaces. Concrete columns have been painted, and palm trees have been planted, adding greenery to the surroundings. For the residents of Torre David, assimilating into the middle-class lifestyle prevalent in the surrounding area holds significance. Access to basic infrastructure is deemed essential, leading to a monthly fee paid by each family to the cooperative for water, electricity, public space maintenance, and security (Frearson, 2012). Additionally, there is a growing adoption of energy-efficient LED lights among the residents, contributing to enhanced energy conservation practices.

Urban-Think Tank has presented a sustainable proposal for the extension and completion of Torre David, addressing some of its most critical challenges. Access to electricity has emerged as a prominent issue, and to mitigate this, Urban-Think Tank has suggested the installation of two wind turbines on the building’s facade along with a pumped Pico hydro storage system. This innovative solution would generate and store electricity at a low cost and with minimal complexity. Recognizing the residents’ desire to challenge societal perceptions of those living in Torre David, the physical appearance of the building holds significant importance in integrating it into the social and economic fabric of the surrounding neighborhood. In response, Urban-Think Tank plans to introduce an external bracing system to support the wind turbines of the wind harvesting system. This external structure will feature varied colors and textures, harmonizing the facade and eliminating the improvised and unrefined appearance. Additionally, to enhance the visibility and normalize the residents and their activities, Urban-Think Tank proposes a transparent extension of Edificio K, providing visual liveliness and engaging outsiders’ perceptions (Brillembourg & Klumpner, 2013). Improving vertical circulation in a more sustainable manner is another crucial modification that needs consideration. To address this, Urban-Think Tank suggests the implementation of a bus line, serving as a proposed vertical extension of Edificio K. The bus would facilitate passenger transportation, movement of goods, construction materials, waste management, and transportation between floors at regular intervals (Brillembourg & Klumpner, 2013). Considering the impracticality of installing elevators due to their high-power requirements and complex maintenance, the bus system presents a more feasible alternative for the residents (Brillembourg & Klumpner, 2013).

Torre David cannot be easily categorized as a conventional slum or a typical residential high-rise, and it defies traditional notions of architecture. Instead, it can be seen as a site where residents strive to improve their living conditions through self-initiated modifications. Remarkably, many of these modifications align with the strategies proposed by Stockholm Royal Seaport. However, there is a distinction between the two projects in terms of the prioritization and value assigned to each strategy. While all five strategies in Stockholm Royal Seaport hold equal importance, Torre David’s residents prioritize the strategies based on their specific needs. For instance, the "Vibrant city" and "Participation and consultation" strategies appear to carry more significance for the residents of Torre David than the “Let nature do the work” strategy. Fig. 2 illustrates the relative importance of each strategy in relation to the others.
A. Multiprogram Ship, Vertical System of Sports and Cultural Platforms, Caracas, Venezuela

In 2014, Alejandro Haiek designed a project that explores the cultural dynamics within complex and geographically diverse slum areas (Ott, 2014). This architectural endeavor employs tactical regeneration and movement techniques as a means to investigate cultural occupation. By activating hybrid public spaces, the project offers an alternative temporal situation within these intricate geomorphological contexts. This initiative forms part of a broader cooperative urban reengineering effort, aiming to establish a network of sports and cultural spaces as new productive and formative urban models for the informal growth areas of Caracas.

Through the integration of social, technological, and environmental strategies, the project proposes innovative approaches to urban life. Its objective is to revitalize community networks, foster alternative circular economies, and encourage citizen participation, public consultation, knowledge democratization, and the accumulation of symbolic capital. Emphasizing sustainability, the project harmoniously combines applied science and local traditions to optimize human, environmental, and material resources (Ott, 2014). Here, providing renewable energy to cover part of the energy needed seems essential.

The architect's approach emphasizes minimal demolition and alteration of the existing configuration of the slums. Rather than expanding horizontally, the project adopts a vertical expansion strategy. This allows for the preservation of the existing structures and a more efficient use of limited space. The primary focus of the project is to foster social interaction, promote education, and encourage active
participation within the slum areas of Caracas. We can consider the sustainability model proposed in this project in Fig. 3.

B. Catalyst Cube, Caracas, Venezuela

In November 2019, the temporary installation designed by Incursiones and Will Sandy Design Studio was unveiled (Ott, 2019). The installation takes the form of a cube and serves as an immediate focal point, aimed at fostering cultural and educational exchanges within the community. Its main purpose is to actively engage citizens in utilizing and reshaping their urban environment. The adaptable design of the cube allows for various configurations to accommodate a wide range of activities such as basketball, exhibitions, classes, meetings, and community events. Serving as a catalyst, its primary objective is to create opportunities for interaction, exchange, and growth within a specific context, with the hope of sustaining these activities even after the installation is moved to its next phase (Ott, 2019). Additionally, the installation features a small rooftop garden intended for cultivating vegetation.

The architect’s objective in this small-scale project is to integrate social interaction into the daily lives of the community. By reinstalling the project in various locations throughout the city, the aim is to encourage people from different backgrounds to interact and foster cultural and educational exchanges. It is noteworthy that the project is not exclusively designed for slum areas but also targets middle-class communities (Ott, 2019). Despite the small scale of the project, the inclusion of vegetation serves as a reminder of the significance of nature. The sustainability model for this project is depicted in Fig. 4.

C. Metro Cable, Caracas, Venezuela

According to statistical data, the urban population in Venezuela accounts for over 90%, with approximately 43% residing in slum areas (Weisbrot et al., 2006). These communities face significant challenges such as extreme poverty, insufficient infrastructure, limited access to public spaces, and inadequate public transportation systems. Situated primarily on hills surrounding the city center, these slums often lack convenient connections to bus and metro networks. Consequently, residents must undertake long journeys on foot or rely on private carpooling arrangements for their transportation needs.

The proposed Metro cable project by Urban-Think Tank aims to establish a cable car system connecting the slum areas with the central city and its existing public transportation network. Initially, city planners suggested constructing new streets to accommodate public buses, but this approach would have required the demolition of numerous dwellings and the alteration of the slums’ configuration (Lepik, 2010). To address this challenge, Urban-Think Tank presented the Metro cable proposal, which gained traction and commenced in 2007. Each station along the cable car line will feature a range of cultural facilities, including a music school, library, dance school, and sports amenities, enhancing the social fabric of the slums (Lepik, 2010). Furthermore, wind turbines will be installed atop the mountain stations to harness renewable energy. However, due to financial constraints, only a portion of the design proposal was completed by 2012.

Like the other three mentioned projects, the Metro cable project aligns with sustainable strategies and goals. The primary focus is to facilitate access to public transportation while minimizing disruptions to the existing slum configurations and avoiding extensive demolitions. Enhancing social interactions and promoting education are also emphasized as crucial objectives within the project. Additionally, the designers address the importance of incorporating renewable energy sources to power the cable cars, highlighting their commitment to sustainability (Lepik, 2010). The proposed sustainability model for the project is shown in Fig. 5.

IV. DISCUSSION

Torre David, an incomplete and long-abandoned structure, was eventually occupied by residents from nearby slum areas in 2007. Subsequently, the inhabitants made various modifications to the building based on their specific requirements. Although we can barely consider the modifications and improvements made by residents as architecture, they often align with sustainable strategies. Furthermore, Urban-Think Tank has proposed a redesign for Torre David, taking into account the needs of the residents. This proposed plan also adheres to sustainable strategies. However, the notable distinction lies in the prioritization of these strategies, with greater emphasis placed on those
directly related to the residents’ needs. For instance, in Torre David, the strategies of creating a vibrant city and encouraging participation and consultation hold greater significance than the let nature do the work strategy. The primary objective of the Metro Cable project is to enhance accessibility and establish connections between slum areas and the urban core. Moreover, cultural spaces will be incorporated within each station to promote active participation and educational opportunities within the slums. To support sustainable practices, wind turbines will be installed atop the stations, harnessing renewable energy to power the cable cars. Despite the spontaneous and unstructured nature of the slums' architecture and configuration, architects opt to preserve them, primarily due to Venezuela's economic and political circumstances. The country's uncertain situation often results in incomplete urban projects, making residents reluctant to vacate their homes. In such cases, if a project stops, the government may not continue to pay for its replacement or may offer replacement housing that may not be of equal quality in terms of accessibility, making negotiations challenging. Thus, minimizing the need for demolition emerges as a more sustainable and suitable solution in this context. The Multiprogram Ship project shares a similar focus on social interaction, education, and community engagement within the slums, where minimizing demolition is also considered a priority, as it offers cost-effective energy solutions and aligns with business concepts of efficiency and responsible resource management. The "Accessibility and proximity" strategy emphasizes affordable public transportation, walking, and cycling, addressing poverty and reflecting economic considerations. The "Let nature do the work" strategy receives less attention, given the current stability of Venezuela's natural resources. As the country progresses, it is expected that the sustainability model will align more closely with the base model, with increased significance placed on the "Let nature do the work" and "Resource efficiency and climate responsibility" strategies. Furthermore, in the prevailing economic and political situation, the model should incorporate limited demolition and prioritize education, aligning with business and management concepts of cost-effectiveness and human capital development. The current sustainability model adopted in Venezuela is illustrated in Diagram six, depicting the relative importance of each strategy based on the country's economic, business, and management considerations.

Fig. 6. Current sustainability model followed in Venezuela.

Note. The size of each bubble shows the importance of the strategy compared to others.

V. CONCLUSION

Sustainability has become a prominent concept, and various models have emerged to promote sustainable development. One of these models is introduced by the United Nations which mentions 17 goals that address different aspects of human needs, both present and future. Within this context, prioritizing sustainability is crucial, particularly in developing countries, as it aligns with addressing their immediate challenges. This paper highlights the crucial role of strategic management in achieving sustainable development, with a specific focus on urban design and sustainability strategies.

Stockholm Royal Seaport has translated these goals into a design language, proposing five strategies which serve as the base model in this research. Comparing the sustainability model in Venezuela, it is evident that certain strategies hold more importance, reflecting the country's unique context. Furthermore, due to the current economic and political situation, limited demolition and education are considered as
two strategies added to the base model. Limited demolition helps optimize resource allocation and minimize costs, while education empowers individuals and cultivates a culture of sustainability. As Venezuela continues to evolve and address its socioeconomic challenges, the path towards a more comprehensive and balanced sustainability model, encompassing all five strategies, including the preservation of nature, is envisioned. The journey towards sustainable urban development involves the collaboration of various stakeholders, ongoing engagement with communities, and a commitment to long-term solutions that uplift the lives of all residents.

The integration of strategic management principles into the urban design process is vital for Venezuela to maximize its resources and implement sustainable solutions. It requires a nuanced approach that considers the economic perspectives unique to the country. Future studies should focus on comparing the extracted sustainability model from Venezuela with other developing countries to evaluate its applicability and effectiveness. By conducting such comparisons, researchers can identify areas for improvement and refine the model to create a comprehensive and adaptable sustainability framework that can serve as a prototype for other nations. This endeavor will contribute to the ongoing efforts to address the unique sustainability challenges faced by different countries and foster sustainable development worldwide.

REFERENCES


Figures:


Fig 2 to 6: Created by the authors.