

The Strategy of Social Responsibility at Universidad Pontificia Bolivariana Toward the Implementation of the Sustainable Development Goals



Ana Elena Builes Vélez and Paula Andrea Zapata Ramírez

1 Introduction

Universities have a great responsibility in promoting the necessary conditions for the challenges posed by sustainable development to be overcome. Despite their budget and administrative limitations, they have a strong and viable ecological argument, understanding that they can reflect on possible ways of changing consumption practices procuring the conservation of natural resources. In this context, some nations have already been developing programs and operating strategic actions to act toward mitigating the degradation of environmental, social, and economic resources and toward the achievement of the sustainable development goals (SDGs) by 2030. In this sense, universities, because of their substantive work in research and innovation, are called upon to find solutions to unsustainable practices and environmental problems to catalyze transformations responsibly. Consequently, and connecting with the Universidad Pontificia Bolivariana's (UPB) goals of stewardship and academic achievement both in and outside of the classroom, we have constructed a plan for making the university campus more sustainable. The UPB is an institution with 83 years of foundation and has five campuses in several cities of Colombia, with the main campus (headquarters) located in Medellín, capital of the Department of Antioquia, located in the northwest of the country. The headquarter campus has an area of approximately 20 ha and an average population, between fixed and itinerant, of about 20,000 people. This community interacts in a variety of spaces: 25 buildings, restaurants, sports areas, laboratories, cultural spaces, and gardens.

A. E. Builes Vélez (✉) · P. A. Zapata Ramírez
Universidad Pontificia Bolivariana, Circular 1 # 70-01, Medellín, Colombia
e-mail: ana.builes@upb.edu.co

P. A. Zapata Ramírez
e-mail: paula.zapataramirez@upb.edu.co

2 Methods

This work illustrates several of the internal and external approaches the UPB has been carrying out in order to achieve its institutional Mission and the strategy to promote the SDGs in their daily activities. To do so, we compiled several institutional documents and reports that contain the methods and results obtained from different efforts and projects. In addition, we also documented how the UPB is integrating corporate social responsibility (CSR) and sustainability measurements in their Strategic Plan (2017–2025). Particularly, we outline the following strategies: (1) organizational culture based on CSR and sustainability, (2) UPB internal key actions, and (3) UPB external actions in support of the SDGs.

3 Results and Analysis

1. Organizational Culture based on CSR and Sustainability

The previous organizational culture was based on a traditional administrative manner that did not take into consideration any sustainability strategy. Hence, in order to achieve the transition from this traditional way of reporting management results to a more holistic expression, the sustainability report, which is a CSR and sustainability performance measurement that integrates sustainable methodologies for corporate reports and gathers the *Global Reporting Initiative* (GRI) standards, is used. It has been necessary to articulate the efforts of the different areas of the university in the main headquarters and in its different national campuses toward the process of sensitization, education, and application in the areas of governance, materiality analysis, characterization of interest groups, and impact management indicators. With this, the institution has begun to unify a common language and frame of reference, as well as a meeting space for critical reflection and proposals, always aiming to achieve the institutional Mission.

To achieve the challenge of changing the organizational culture, it was necessary to implement CSR in the core of the organization. Understanding CSR as “how businesses align their values and behavior with the expectations and needs of stakeholders—not just customers and investors, but also employees, suppliers, communities, regulators, special interest groups and society as a whole.” (Fontaine 2013) The CSR requests the organization actions that allow the management of economic, social, and environmental impacts of its operation to reduce negative outcomes and maximize the benefits for the stakeholders, the community, and the society.

In organizational terms, sustainable development is the highest commitment of the administrative and teaching staff of the university (Gomez 2018); this implies that the institution continues to exist and that it achieves its Mission and the Strategic Plan. The institution has been aware of the commitment to leave the new generations a better world and the importance of educating those generations with the understanding of their commitment to living in a sustainably. In particular, the Strategic

Plan declared the importance of an integral model that considers the care of the renewable and non-renewable resources used daily by the institution, designed to protect and to strengthen the social capital of the university community. Hence, the UPB recognizes and appropriates the call of the GRI to consolidate a sustainable economy in which organizations are managed responsibly and comprehensively, and transparently communicate their management to different stakeholders.

Beyond the numbers and measurements, the challenge of the institution is to create a culture of sustainability with which all the organizational work is permeated, to make possible its great commitment to envision a better world for the present and future generations. In other words, for UPB, sustainability means good practices, leadership, transparency, and accountability. It is important to highlight that in January 2018, the World Economic Forum ratified the need to strengthen the commitment to sustainability in order to help its partners and members make a substantial contribution toward sustainable development and, in this sense, has offered a platform for public–private cooperation. Sustainability policies of organizations are more prone to succeed if all the different parties are involved. The participation of stakeholders, suppliers, and others to join shared efforts that generates collective outcomes, as opposed to individual actions, results in superior effects that are more comprehensive. However, before embarking on the path of sustainability within the institution, it is necessary to establish a measurable action plan, such as the Strategic Plan (2017–2025). This plan should have achievable and challenging goals since what is not measured is not improved. It is also necessary to establish indicators to monitor the implementation of the sustainability plan and achieve a balance that allows the organization to endure over time in an increasingly competitive international environment.

Through its 83 years of existence, the UPB has had as one of its guiding principles the positive impact on each of the dimensions of what is now called sustainability. In terms of its structure, the institution has designed a series of policies aimed at promoting the well-being of its stakeholders. Throughout several administrations, this policy was aligned with the initiatives that occupied the panorama of social responsibility: The Global Compact and the Millennium Development Goals. Certainly, and in accordance with the Sustainable Development Objectives, efforts, such as the setting up of an Environmental Committee during 2017 conformed by an interdisciplinary team, have been made. The committee is led by the Environmental Research Group at the UPB headquarters in collaboration with the Colombian National Center for Cleaner Production. They built the annual report where measurements of the environmental footprints and the use of waste disposal, among others, are addressed.

One of the most important achievements of the first Sustainability Report (2017a; b) was the establishment of the bases for the analysis of unsustainable practices and the identification and prioritization of interest groups that are part of the university. Interest groups are conceived as actors constituted by persons or entities that have direct or indirect influences in the activities and decisions correlated with the performance of the UPB organization. It has been configured as an essential element in strategic planning, as indicated in the GRI Standards (2016).

Finally, the university begins to achieve the articulation of the teams at the headquarters campus since it has been found that the methodological approaches and the tools used in the report are also transferable to the multi-campus units at the national level, favoring cooperation and networking. It is necessary to continue working to achieve a coherent and interconnected UPB multi-campus strategy in sustainability, as a response to the expectations of interest groups that are increasingly attentive and aware.

2. UPB internal key actions

• UPB Micro-Network

By 2050, 70% of the world's population is projected to live and work in cities, with buildings as major constituents. The energy consumption of buildings contributes to more than 70% of electricity use, with people spending more than 90% of their time in buildings. Future cities with innovative, optimized building designs and operations have the potential to play a pivotal role in reducing energy consumption, curbing greenhouse gas emissions, and maintaining stable electric-grid operations. The digital evolution presents a great opportunity to achieve the goal of the modernization of the conventional electrical system by transforming it into a smart grid. Smart-Grid environments are focused on creating and using information and communication technologies to support new and potentially more sustainable ways of producing, transmitting, distributing, and consuming electricity. They offer the possibility of greater monitoring and control throughout the power system and, therefore, a more effective, flexible, and lower-cost operation. The security conditions, diversity of end-use, instrumentation, and presence of the appropriate human resource make the UPB campus headquarters a perfect scenario to implement and appropriate in a controlled manner many of the technologies that characterize living labs. The strategy is named *the UPB Micro-Network program*, and its central operation is located at the heart of UPB infrastructures, where the power distribution network is located. The Micro-Network supports various systems, including laboratories, safety, water, food, transportation, and communication. For instance, from the control center, real-time monitoring activities are conducted to follow the performance of the photovoltaic solar generation systems, the weather station, the electric vehicles and cycling charging stations, and other functions vital to the university's community. We are also implementing a smart building technology by using information about occupant locations and activities in order to improve building efficiency at the UPB headquarter campus (Isaac-Millán et al. 2018).

• Integral Waste Management Strategy

Waste, as a management issue, has been evident for over four millennia. Waste management is characterized by all the activities and actions required to manage waste, from its inception to its final disposal, and intends to reduce adverse effects of waste on health, the environment, or aesthetics. This includes collection, transportation, treatment, and disposal of waste, together with monitoring jointly with a regulatory framework relative to waste management (Popescu et al. 2016) (Fig. 1).



Fig. 1 UPB Micro-Network central operation. Sustainability Report UPB (2017a; b)

UPB already has planned and implemented many successful reusing, recycling, and composting programs across the headquarter campus. The waste diverted from landfills has increased annually. In particular, the university has implemented an integral waste management approach, following the indications of the GRI Standard 306-2/306-4 (GRI Standards 2016). For instance, results of the integral waste management between 2017 and 2018 are as follows: ordinary waste 32.75%, recyclable 18.59%, organic waste 32.70%, Respel waste 0.5%, and special waste 15.48% (Fig. 2).

As part of the integral waste management, the UPB headquarters is currently implementing a bio-digester strategy as an additional approach to manage the waste produced at the campus. To that end, the university has designed, built, and acquired prototypes of anaerobic digesters of diverse technology and at various scales. A bio-digester is a method of closing the food-waste loop. The process takes the undesired food waste and turns it into two separately valuable products. Pre- and post-consumer food wastes are collected to be chemically decomposed in an airtight chamber. As the waste breaks down, the biogas created can be harnessed to produce clean, versatile energy. Solid remnants after decomposition are nutrient-rich and used as compost, returning the food waste to the earth (Hambrick 2011). Currently, the UPB produces an average of 120 kg of restaurant waste (processed and unprocessed food) daily. Pruning residues (branches, dry leaves, and fruits, among others) are also added to the waste because of the large green area of the campus of almost 20 ha. So far, two bio-digester systems have been installed at the headquarter campus. The first is a testing prototype designed at the university. It can take 50 L of feedstock per day and produce 600 L of biogas and 4 kg of a biofertilizer that is afterward used on campus

INTEGRAL WASTE MANAGEMENT (GRI)

PG7 GRI 306-2 GRI 306-4

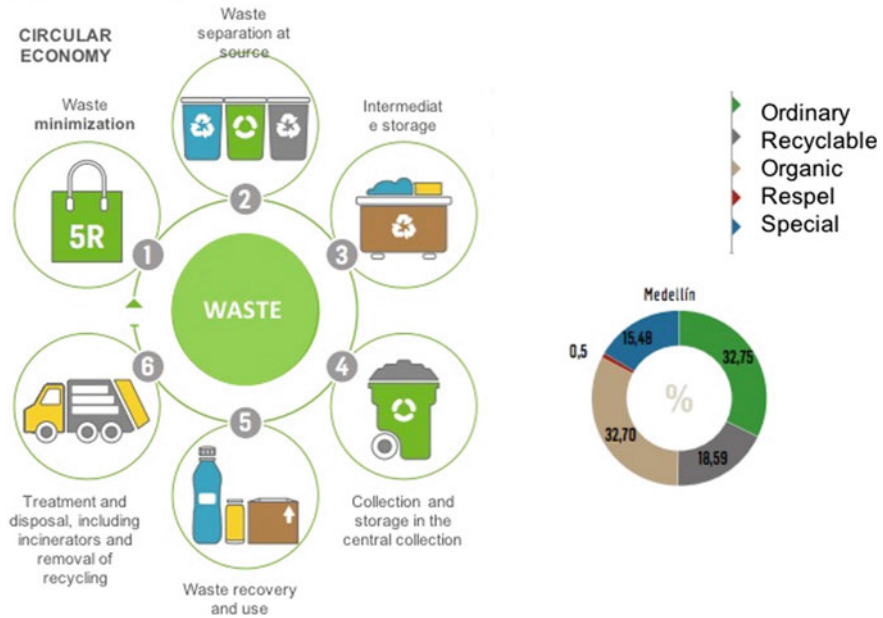


Fig. 2 Integral Waste Management UPB Medellín. Sustainability Report UPB (2018)

to grow crops at the urban garden. In addition, a second low-cost bio-digester (650 L) system was purchased (Fig. 3). Both systems are planned to be used for the treatment of wastewater and the co-digestion of restaurant waste, to reduce the carbon footprint and improve the environmental aspects in water, soil, and air. The results of these tests will be used to escalate the treatment of waste at a larger scale.

Future efforts are focused to further increase recycling and composting on campus. Each building will conduct multiple waste audits to further understand the amount of waste produced and the types of waste products generated in the different parts of the university. All these actions will help the university to effectively and actively stimulate recycling practices on campus among students, the staff, and the faculty in general, through highlighting and encouraging the participation in waste reduction. Additional waste reduction initiatives and programs, such as the banning of single-use plastics and the reduction of paper consumption with the ‘Zero Paper Document Management’ campaign, are being implemented and will be critical to help ensure that the UPB reaches the ambitious goals stated in the UPB Strategic Plan.

Furthermore, through the GRI 303-2 strategy (GRI Standards 2016), it was possible to review and measure the water consumption at the headquarters campus, which allowed the consolidation of an improved culture focused on the correct usage of water resources. It is important to recognize that the water consumed at the headquarters’ campus is supplied by the public aqueduct and, therefore, the extraction of



Fig. 3 Bio-digester UPB headquarters—Medellin. Picture provided by Oscar Vasco (2018)

this water is carried out by the company that provides the service. It is also important to note that during 2018, wastewater characterizations were performed at the headquarters' campus. Nonetheless, rainwater is also collected and used to supply the firefighting networks, the sanitary units of buildings 9, 10, 18, and 11, and the parking lot building. Thus, of the 100% of water consumed at the campus, 29% is supplied by rainwater (UPB 2018, p. 46). Figure 4 represents the water footprint at UPB Headquarters between 2017 and 2018. Indicators are measured by $\text{m}^3/\text{student}$.

In order to achieve the Carbon Neutral Certification, a carbon footprint calculation was carried out to meet this challenge. To do so, we used the methodological approach suggested by the Greenhouse Gas Protocol (GHG and GHG Protocol Standards 2015). In the measurement, four categories were taken into consideration: goods and services, leased assets, waste generation, and business travel (air and land). Figure 5 shows the direct and indirect emissions with their respective value equivalent to CO_2 (UPB 2018, p. 48).

- **UPB Smart House**

The Intelligent Micro-Network of the UPB and Materfad-Materials Center UPB, together with the Schools of Engineering, Architecture, and Design of the university, throughout an interdisciplinary project, conceived and designed the Habitat house (Fig. 6) as part of the strategy for the Smart Living Lab. During this project, UPB researchers designed a living house–laboratory with an area of 80 m^2 . The project

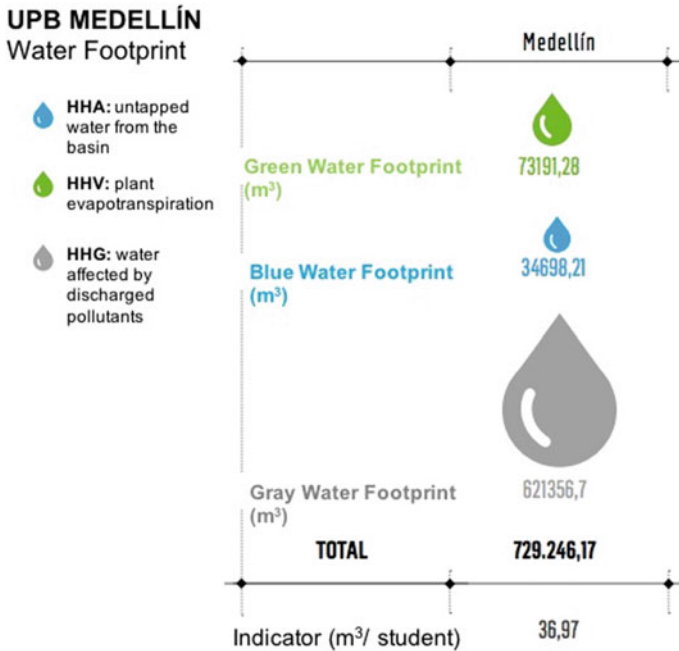
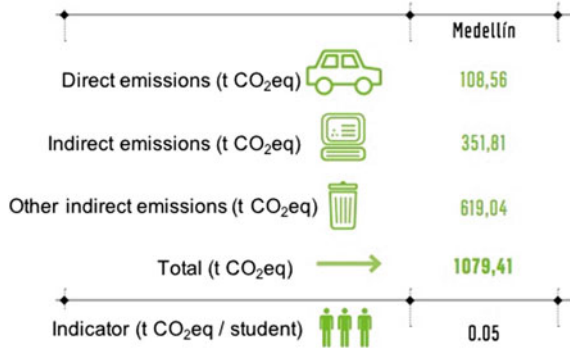


Fig. 4 UPB Medellín Water Footprint between 2017 and 2018. Sustainability Report (2018)

Fig. 5 UPB Medellín Emissions 2018. UPB Sustainability Report (2018)



followed the three basic elements of smart living spaces: (1) smart technology, (2) smart materials, and (3) smart design. The house arose from a bioclimatic design, made with materials and construction processes that contribute to sustainability practices, and has adequate accessibility conditions for people with reduced mobility. The house has an integrated system for the generation of electricity from solar panels, homemade bio-digesters, and batteries, which can be connected or disconnected from the public service network at will. The space is domotized, that is, set up with intelligent control and automation of different elements (lighting, sound, temperature,



Fig. 6 UPB Habitat House. UPB Sustainability Report (2018)

curtains, and security, among others). LED lamps allow access to the place at night. Additionally, urban micro-agriculture, such as home gardens with automated irrigation, green walls, crops built from recycled materials, and an aquaponic system, are also part of the smart house. The control center of the Intelligent Micro-Network of the UPB constituted the place where the system's performance is shown by means of graphical visualization systems. Finally, the project is very important for academic purposes since students also use the house as a space to practice and familiarize what they have acknowledged and to appropriate new technologies. The house constitutes a solution that looks forward to the possibility of bringing energy to remote areas of the country, reducing consumption, protecting the environment, and increasing energy efficiency.

All previous UPB strategies are of vital importance, in particular for Medellín and the university itself, since the city has been increasingly facing progressive environmental issues. The area in which the city and university are located, called Valle de Aburrá, shows a significant and incremental deterioration in air quality. The indicators of respirable particulate matter of 2.5 and 10 μm exceed the limits established by the environmental standards. According to the Medellín Ministry of Health, about 15% of non-violent deaths in the city are caused by respiratory diseases (Isaac-Millán et al. 2018).

Through the sustainability annual report, the information gathered in all of these internal strategies is being used to report to the UPB community fine-grained feedback about electricity, water usage, and waste management. The information is also being used for decision-making support, performance studies, protocol evaluations, development standards, security requirements tests, and automated functions, with

interoperability of new technological devices needed for the development of future smart- and micro-grid technologies at the headquarters campus, but also with the aspiration of replicating these practices and implementing them in other UPB campuses or, with a reasonably cost-efficient deployment, in remote areas of the country.

As a result of the combination of all these multiple strategies, the university was awarded the Carbon Neutral Certification (2018), provided by The Colombian Institute of Technical Standards and Certification, thus, becoming the first Latin–American university to receive said acknowledgment. This demonstrates the full commitment of the institution and recognizes the efforts made by the UPB to proactively manage sensitive issues in order to address the impact of climate change in an efficient fashion.

4 UPB External Actions in Support of the SDGs

The UPB is enhancing its research, transfer, innovation, and development activities in five strategic focuses: (1) health, (2) culture and humanization, (3) information technologies, (4) energy, and (5) water, food, and territory (Fig. 7). These focuses allow the institution to identify and systematize the relationship between internal capacities and the challenges posed in the global development agendas, which outline the social problems of today’s world with relation to life, habitat, ecosystem resources, and future challenges. This strategy also conveys the UPB’s capacities to evidence the challenges of greater impact, allowing the creation of scientific committees to provide analysis, advice, and consultation to the UPB’s informational structures and to the community in general. In this sense, the UPB has decided to prioritize its strategic focuses, combining them with academic, scientific, and technological processes that allow it to generate a high social impact, according to the humanist identity, but at the same time, innovative in its pertinent impact.

One of the strategic focuses is *Water, Food, and Territory*, to convene human and institutional capacities toward the study, research, transfer, and innovation of resources and processes that are fundamental to the existence of life and the well-being of people and communities. Bearing in mind that these resources and processes are constitutive of the preservation and reproduction of life from a biological and social point of view, and access to them is mediated by culture and human needs,



Fig. 7 Graphic representation of the Strategic Focuses of UPB. From left to right: (1) Culture and Humanization, (2) Water, Food and Territory, (3) Energy, (4) TICs and (5) Health. Reproduced from Sustainability Report UPB (2017a; b)

in addition to the fact that their interaction is a priority for human beings and their relations with the environment. As a result, this focus is established as an institutional bet that seeks to confront problems related to water, food, and territory, in the context of society's relations with nature. These problems go through the interpretation and design of proposals from interdisciplinary fields, considering that the UPB stands in a privileged position where it is possible to draw attention to what is happening in society. Sectors, groups, institutions, and society all look up to academia for scientific, technical, and comprehensive interpretations to think critically about alternatives in the face of specific manifestations. Concurrently, another strategic focus, energy, seeks for solutions that satisfy the rising high-energy demand in the coming years. This demand will be supported by the implementation of new energy sources, greater efficiency, balance in the distribution of energy resources, as well as new lifestyles, which allow the adjustment of the variety of costs and minimize the environmental impact generated by the population's growth. Both of these focuses recently joined efforts to promote collaborative work and the articulation of academic-administrative initiatives that enable co-creation between schools, faculties, and research groups (internal relationship of the academic-research communities). From this internal collaboration, a joint program was launched and entitled *Habitat and Sustainability*. The program aims to implement an interdisciplinary mobile laboratory that allows a dialog of knowledge between the communities' traditional knowledge and the systematic knowledge generated in academia. Jointly and collaboratively, the mobile laboratory seeks to build solutions to social problems related to a more sustainable habitat that can improve the livelihoods of different communities. After its configuration, the program built a map of capacities that contains the relationship with different stakeholders and the previous cooperation efforts made inside and outside of the university. Hereinafter, the program stated their lines of actions in order to ensure solid and strengthened proposals that were in line with the SDGs and with the Strategic Plan of the university. Particular attention was put on previous initiatives related to healthy living habits, environmental sanitation measurements, minimum conditions for living in a house and for obtaining and using energy, the minimum technical construction for the of housing stability, the adequate use of resources and sustainability, identification of available resources and their proper use, empowerment of their culture, territory, and capabilities and, finally, education with an intercultural approach, respecting and reflecting the knowledge of different communities.

The lines of actions of the program and its manifestos are as follows:

– Governance and Governance for Sustainability

The line understands the complexity of the interaction between stakeholders, society, the private sector, the state, and the academia for political processes of decision-making and formulation and implementation of public policies in a participative and collaborative manner in the search for sustainable, inclusive, and equitable development. Therefore, the line addresses questions of how, by whom, and for whom environmental decisions are made and about the access, use, appropriation, and

distribution of natural resources, thus contributing to changes in the way that society organizes itself to solve its dilemmas and create new opportunities.

– Ecosystem services and Infrastructure

The line will deal with issues related to the management and sustainable use of the ecosystem services, as well as issues related to the infrastructure, understood as the environment where a cycle of interaction and exchange of resources (matter, water, energy, communication, social, money, etc.) toward the development of society and common welfare in the built habitat takes place. While ecosystem services are understood as the benefits that nature brings to society, such as supply, regulation, support, and cultural value, the line can address problems and challenges related to materials, waste disposal, valuation of ecosystem services, responsible use of resources (energy, water, land, and air), availability of food, access to public space, recreation, and cultural expressions, among others, ensuring rapid and non-polluting mobility. The line will also address climate change issues such as resilience, adaptation, and mitigation.

– Housing and Social Interaction

The line on housing and social interaction tends toward a systemic vision, considering that no single aspect leads to a sustainable habitat. For this reason, the study of construction practices, materials, mobility, public space, and green space, among others, seen in their interrelation, are of interest. Empowering citizens to use different mobility solutions and to integrate them into the innovation process, motivating them to participate, putting the right tools in place to enable a bottom-up dialog, and translating ideas into sustainable commercial products or services, are also tackled in this line. This implies, among other factors, the needed education, and participation of citizens (including the users, government, and industry), around topics related to the projection of their environment, their interests, and the social and ecological implications of the construction of housing or infrastructure with certain characteristics.

5 Conclusion

The different strategies reported herein were important for the understanding of the current sustainable approaches on the headquarters campus and the obstacles that the university must overcome to become more sustainable and to fully fulfill the goals stated in the Strategic Plan. To do so, we are constantly in contact with other universities that have served as models for sustainability practices, attempting to learn how their various communities' initiatives succeeded in implementing similar strategies. Furthermore, the results show that it is important, and necessary, to create clear medium- and long-term strategies. Hence, the next efforts should focus on infrastructure improvement and the expansion of the technological capacity that could contribute new strategies to confront the increasing environmental challenges.

Sustainability needs to be thought of and acted upon as a harmonic compound of three great systems: the economic, the social, and the environmental. To solve today's most pressing development and sustainability challenges, the implemented UPB strategy has allowed the establishment of synergies between universities and research institutes and partnerships with the industry, government, and communities, in order to tackle several national development challenges. These synergies have enabled a more collaborative work, building trust among all the interested parties, and therefore, allowing the design of appropriate scalable solutions that could contribute to the achievement of the SDGs.

With the continuation of the strategy, the UPB has been linked to different national and international research networks on sustainability, to develop collaborative research and development proposals. One of the networks is *ROUTES Toward Sustainability* (2019), in which around 50 universities around the world are involved. This network has promoted an annual meeting to discuss the impacts of the multiple ecological, economic, and social footprints, as well as the development of research proposals for the Horizon 2030. Another important international partnership is *LeNS* (2019), the *International Network of Networked Learning on Sustainability* (2015–2018), an EU-supported project (ERASMUS+) involving 36 universities in Europe, Asia, Africa, South and Central America, with the target of promoting a new generation of designers (and design educators) capable of contributing effectively to the transition toward a more sustainable society for all. This network has worked on the development of educational strategies for the implementation of sustainability in the different programs of the university.

The final question that may arise after reading this paper is: can an integrated internal approach toward the implementation of the SDGs really make a substantive contribution to achieving sustainability inside the university that can impact the community? As Galpin, Whittington, and Bell explained, having an organizational infrastructure that promotes a culture of sustainability results in a positive employment and a more structured organizational level of sustainability and performance (2015). Nevertheless, to achieve the desired results from the university's sustainability efforts, leaders, in all levels, must continue to encourage a sustainability practice focused culture that permeates all levels of the university.

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Ana Elena Builes Vélez M.sc in Project planning and Management. She is a Product Design Engineer and an Associate Professor at Universidad Pontificia Bolivariana, Colombia. She is the Coordinator of the Advanced Formation and Research fields of all post-graduate academic courses of the Architecture and Design School Faculties at the same University and is the leading researcher of the “Fashion, City and Economy” program. Her main work focuses on urban development through social innovation, sustainability, and multiple social, cultural, and economic impacts for urban transformations in Latin American cities.

Paula Andrea Zapata-Ramírez Ph.D. in Marine Biology and Ecology. Currently, Dr. Zapata is the National Leader of the Water, Food and Territory Strategic Focus of UPB. Moreover, she is an Associate Professor at the School of Engineering where she works on the use, application, and appropriation of technological tools and methods such as remote sensing, which is useful for decision-making. She has a broad international experience in various fields, including biodiversity monitoring and the conservation and restoration of natural resources. She is particularly interested in the interface between social and environmental aspects of ecosystem management. Her primary work is to identify practical approaches that can help ensure a sustainable future for the natural resources and safeguard the livelihoods of local communities.