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Zero Single-Use Plastics University

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Abstract Since 2019 CES University began with the implementation of the zero single-use plastics guidelines in order to restrict 100% the use of all single-use plastics at Campus and thus avoid the final disposal in sanitary landfills, with all the negative impact that it has into the fauna, flora and human health, eliminating the generation through prevention, reduction, reuse and recycling. Those single-use plastic products were replaced by elements such as cane bagasse and starch of corn; among others biodegradable and compostable, in order to end the life cycle of these products transforming them into compost. Since the use of single-use plastic elements was banned, we managed to reduce the generation of these products by 89%. From 471.5 Kg in 2018 to 53 Kg in 2019. With this practice, we contribute to SDG 13 - goal 13.3, SDG 12 - goal 12.4 and 12.5. This practice is being replicated in 10 more universities countrywide.

Keyword:

climate action, plastic, single use; sustainability, zero.

1. Introduction

CES University is a National, Autonomous, Private, Nonprofit and Self-Sustainable Higher Education Institution. Since the foundation on July 5, 1977, it has been dedicated to offering pre and postgraduate educational services in all areas of knowledge, with emphasis on the area of health and at the technological and professional level with the highest human, ethical and scientific qualities that stimulate cultural, social, ideological, political and religious pluralism.

Our mission to be a Higher Education Institution committed to excellence, is to advance actions in teaching, research, innovation, extension and sustainability, with the purpose of contributing to the development of society and the formation of free, autonomous, ethical, scientific and competent human beings in a globalized world.

CES University is made up of 1550 employees and 6154 students in its own programs. We have 110 formal programs: 2 technologies, 13 undergraduate programs, 66 specializations, 26 master's degrees and 3 doctorates. 8 of our programs accredited by high

quality standards by the Ministry of National Education (MNE) [1].

At CES University we conceive of sustainability as the evolution of social responsibility, and it is transversal to the substantive functions of the institution; teaching, extension, research and innovation, creating value for society through them and the relationship with our stakeholders.

By assuming sustainability as the essence of our mission and vision, we are responsible for our impact on a social, environmental and economic level; working for the balance between economic growth that allows viability, the benefit to society with inclusion and social equity, as well as responsible environmental development.

The sustainability model of CES University responds to the 2030 Agenda for Sustainable Development which is an ambitious action plan in favor of people, the planet, prosperity, peace and alliances. The five foundations will go to the world in favor of a sustainable and resilient course, oriented to world development over the next 15 years, taking into account the systems that tend towards the conservation of diversity and productivity and responsible consumption over time.

2. Zero single-use plastic

A study conducted by the World Wide Fund for Nature (WWF) in conjunction with the University of Newcastle, Australia indicates that on average a person can ingest, through water, air and food, and depending on consumption habits, about 5 grams of plastic weekly. An amount that is equivalent to eating a credit card. Situation that we are not oblivious to, since drinking water and beverages may contain micro plastics (plastic particles measuring less than 5 mm). The reduction of the generation of this type of plastics contributes directly to improving health issues, even more so in our country where, according to data provided by the Attorney General's Office, one million tons of plastic waste are generated in Colombia annually, of this total only 7% is recycled, the remaining 93% ends up accumulated in the sanitary landfills [6].

Following the examples of Canada, Washington in the United States, San Andrés and Boyacá in Colombia; CES University became the first in the “Aburrá” Valley to say goodbye to cigarettes, PET bottles, disposable plates and cutlery, all of them considered single-use plastics as a contribution to sustainability [2].

The decision was taken by recognizing scientific studies that indicate that plastic inputs such as expanded polyethylene (poron), polyvinyl chloride (PVC), low density polyethylene (LDPE), polyethylene terephthalate (PET), are highly polluting materials. The vast majority of these elements end their life cycle in sanitary landfills or in the worst case in open-air dumps, generating all the impacts mentioned above.

In addition to this, the little supply that exists in the city of companies that make use of this type of materials through recycling was evidenced; among the reasons mentioned in this situation is the physical conditions of the material to be used; as well as the minimum necessary volume for this material to be profitable.

Scientific research, every week a human being ingests the plastic equivalent to a credit card, through micro-plastics which are present in the water for human consumption etc. [3].

According to Greenpeace, in its report “Plastics in the oceans, comparative data and impacts”, micro plastics (particles smaller than 5mm) can be ingested by marine fauna, including plankton, crustaceans, and fish, and can cause problems for their physical presence in the intestine because of the chemical contaminants they carry. They can even be passed along the food chain until they reach our plates [4].

For these reasons, since 2019 we found that at CES University it was restricted and there is no evidence of the use of cigarettes, plates, cutlery, PET bottles or elements of polyvinyl chloride (PVC) and expanded polystyrene (poron). We decided to take action and join forces with our suppliers to work for sustainability. This is how the path to the implementation of the guidelines [5] begins and the objective is to restrict the use of single-use plastics at CES University to 100% and thus avoid the final disposal in sanitary landfills, resulting in contamination of water sources, high permanence in the environment, affectation to the fauna and flora, affectation to the marine life, etc.; eliminating the generation of plastic waste through prevention, reduction, recycling and reuse activities.

We began the process of articulation with suppliers through training on the effects of plastic. Subsequently, the zero single-use plastic guidelines were approved at the administrative level. With this commitment from senior management, we began the transition period so that suppliers, with our support, could flexibly adopt the guidelines and make changes to single-use plastic products by elements such as cane bagasse and starch of corn; among others, whose characteristics were biodegradable and compostable, in order to end the life cycle of these products transforming them into compost.

During this transition, new clauses were signed in the contracts with the suppliers, showing the commitment and the possible sanctions in case of breach of these.

Additionally, within this period we investigated the suppliers that could provide these elements, with the aim of making alliances and relationships, so that they were able to meet the demands of all our tenants.

Once the transition period is over, audits are carried out permanently to verify the adherence and commitment of the suppliers; and in this way corroborate compliance with the clause where they explicitly agree not to commercialize or generate single-use plastic elements.

All this is accompanied by strong awareness and communication campaigns to different interest groups, such as the university and external community, through stands, activations, talks, press, billboards, etc. This is how our main observers today are precisely employees and teachers of our university, who report any type of non-compliance, but, in addition, they make us know new materials for use.

Once the practice began and corroborating the commitment of teachers, students, administrative staff and providers, we decided to extend the experience and began to interact with other Higher Education Institutions and media to disseminate the practice so that more organizations could apply it. Recognition as good practice has also allowed other institutions to join. This is how today, 7 universities in the region and another 3 nationwide begin to adopt these zero plastic lineages. In addition to starting to be a public policy as we see today in the adoption by municipalities such as Itagui and departments such as Antioquia.

As part of the impact and scope of the CES University initiative, in 2019 the G8 universities (8 accredited universities of the Metropolitan Area of the Aburrá Valley) among which are the most representative of the region: EAFIT University, Pontificia Bolivariana University, La Salle, EIA University, University of Medellin, University of Antioquia, National University headquarters Medellín, decided voluntarily to establish guidelines for the restriction of single-use plastics in their university fields; according to the dynamics of each of these.

In addition to the aforementioned, which are located in the municipalities of the Metropolitan Area of the Aburrá Valley, the following higher education institutions from

other areas have been advised on this issue: Uniminuto, Córdoba University, Los Andes University and El Rosario University; as well as Vermont School.



Figure 1. Biodegradable and compostable elements

We started the articulation process with suppliers through training on the effects of plastic. Subsequently, the single-use plastic zero guidelines were approved at the administrative level. With this commitment from senior management, we began the transition period so that suppliers, with our support, could flexibly adopt the guidelines and make changes to single-use plastic products for items such as cane bagasse, starch corn; among others, whose characteristics are biodegradable and compostable, in order to end the life cycle of these products by transforming them into compost.



Figure 2. Composting system

The composting system, becomes a solution for the reduction of waste that ends up in sanitary landfills, which become pollution factors for the soil, water sources, and for air in the case of the generation of particulate material for the transport of waste to the final disposal site.

Additionally, we have the smart recycling points that, together with the composting and generation reduction system, becomes a solution for the reduction of plastic waste that ends up in sanitary landfills, becoming pollution factors for the soil, water sources and seas; For this last resource, as Greenpeace mentions in its report “Plastics in the oceans, comparative data and impacts”, micro plastics (particles smaller than 5mm) can be ingested

by marine fauna, including plankton, crustaceans, and fish, and can cause problems for their physical presence in the intestine because of the chemical contaminants they carry. They can even be passed along the food chain until they reach our plates

Within this period, we investigated the suppliers that could supply these elements, with the aim of making alliances and relationships, so that they were able to meet the demands of all our borrowers.

Those single-use plastic products were replaced by elements such as cane bagasse and starch of corn; among others, whose characteristics were biodegradable and compostable, in order to end the life cycle of these products transforming them into compost. Audits are carried out permanently to verify the campus is free of those plastics. All accompanied by strong awareness and communication campaigns to different stakeholders.

3. Contribution to the SDG's

With this practice we contribute to SGD 13 and its goal 13.3 of improving education, awareness, and human and institutional capacity regarding climate change mitigation, adaptation, reduction of its effects and early warning. We adopted this measure that contributes to the reduction of total emissions of greenhouse gases.

In SDG 12, goal 12.4 is achieved, achieving the environmentally sound management of waste throughout its life, also reducing its release to soil and water, in order to minimize adverse effects on human health and environment; in goal 12.5 reducing waste generation through prevention, reduction, recycling and reuse activities.

4. Groups impacted with the initiative

Since the implementation of the guidelines, the following interest groups have been impacted 1550 employees, 6154 students. Also, this has been replicated in one of our interest groups that are the internal suppliers of food services (25 in total), such as coffee shops, food carts, and companies of dispensing machines; so that everyone adopts more sustainable practices.

Another external interest group, the universities that make up the G8 (the 8 universities accredited by the Ministry of National Education), have taken advantage of this initiative and socialized the guidelines so that each one can adapt them and begin this single use plastic restriction at the institutional level, so that 7 more universities are added, and the pact of these universities is signed for "zero single-use plastics".

Also community and society are being benefited in general with all the environmental and health benefits.

5. Results

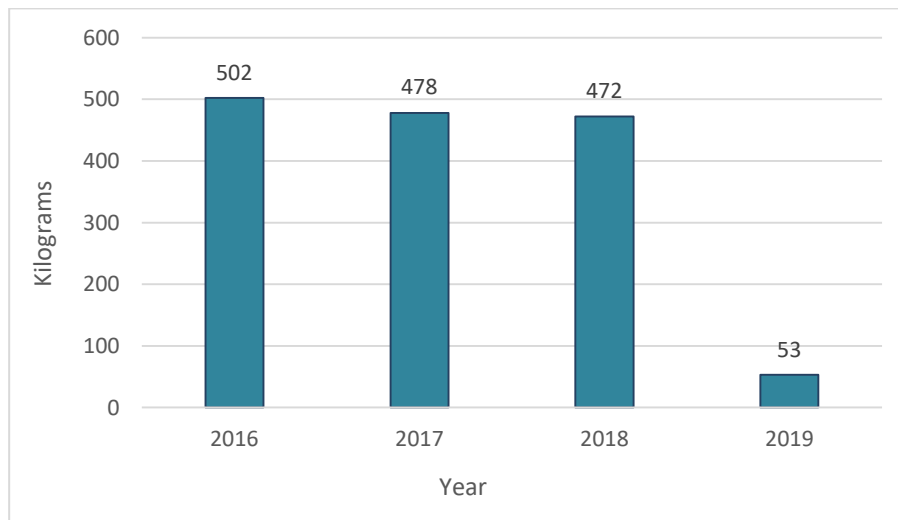
With a university population of 1550 employees and 6154 students, there is a high generation of waste. In 2018 alone in the coffee dispensing machines, 100,000 plastic cups were generated; which ended their life cycle in a sanitary landfill due to complications to be recycled.

By eliminating these glasses and adding the bottles, cutlery, plates, etc., generated by the university community, a contribution to a more sustainable city is evident. Additionally, we are working on the composting system to join forces and generate less and less waste. It is an articulated and conscious work with the different suppliers.

Since the use of single-use plastic elements was banned, we managed to reduce the generation of these products by 89%. From 471.5 Kg in 2018 to 53 Kg in 2019.

This evidence the commitment from the principal through all the stakeholders within the university campus.

Graphic 1. Consolidated generation of plastic waste



All this together is reflected in the reduction of 11,432 Kg of CO₂ in our carbon footprint scope 2, and the reduction of 45 tons in greenhouse gas (GHG) emissions. The practice has been recognized and disseminated by different media nationwide:

- <https://www.elespectador.com/noticias/medio-ambiente/universidad-ces-de-medellin-prohibe-plasticos-de-un-solo-uso-en-sus-instalaciones-articulo-870006>
- https://caracol.com.co/emisora/2019/07/09/medellin/1562690880_262547.html
- <https://gente.com.co/universidad-de-medellin-prohibe-plasticos-de-un-solo-uso>
- <https://telemedellin.tv/plastico-universidad-ces/340473/>
- <https://abceconomia.co/2019/07/10/la-universidad-ces-prohibio-el-uso-de-plasticos-en-sus-sedes-de-medellin/>
- <https://blogbagatela.wordpress.com/2019/07/09/universidad-ces-es-la-primer-a-en-prohibir-el-uso-de-plasticos-en-medellin/>
- <https://www.elcolombiano.com/antioquia/el-camino-para-despedir-los-plasticos-de-unico-uso-BH12515664>

6. Concluding Remarks

Among the main conclusions that can be highlighted by the implementation of the initiative, are:

- Demystification in relation to the dependence of single-use plastics; it is possible to find alternatives to this type of elements. Recycling is not enough and responsibility cannot be completely shifted to the consumer. The challenge is to reduce and reuse, before recycling. Practices must be found that allow this reduction and education from the generation, which has been possible and evident with positive results with the implementation of these guidelines, their wide dissemination and acceptance internally at the university and by external third parties.
- 89% reduction of single-use plastics, which was generated on the University Campus, between 2018 and 2019.

- Thanks to these guidelines, relationships and alliances were established with both regional and national suppliers, which provide environmentally friendly elements.
- Acceptance and appropriation of different interest groups, in relation to the restriction of single-use plastics.
- Opportunities to replicate and scale the practice, which contributes to the generation of culture. This is reflected in the great acceptance of the practice that will allow it to expand its impact to other organizations that join in its adoption: G8 universities, 4 universities in other regions, 1 school, Governments of municipalities in Colombia.

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