

The Double Benefit of Environmental Sustainability – The Case of ISPGAYA (all text format must obey STYLYNG - manual styling - on word layout provided as shown in the image above)

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Abstract Abstract (between 150 and 250 words)

Complete Articles must contain a maximum of 4500 words, counting from the “Introduction” to the “Final Considerations”. The “References” section should not be included in this count.

Abstract must contain: Theme; objectives; methodology; results; conclusions.

Keywords: Sustainability; Renewable Energies; Solar Panels; Led Illumination; Energy Consumption Optimization. (between 3 and 5)

1. Introduction

It is common knowledge that the education sector is not considered a polluting sector, however, since in any human activity there is not only consumption of natural resources, but also waste production (Matos, 2020). The examples are many

and increasingly overwhelming, such as the lack of drinking water quality, pollution of rivers and seas, global warming, ice melting, typhoons and hurricanes, and countless other potentially catastrophic situations (Harvey, 2018).

This is the assumption of all the theoretical production associated with the theme of sustainability (Randers et al., 2018) and the concept of development (Barska et al., 2020; Wyrwa et al., 2020; Wyrwa et al. 2021;), and this term is usually associated with that of innovation, in its various domains, which may be that of energy and energy efficiency (Gökgöz & Güvercin, 2018; Kolosok et al. 2020; Sun et al., 2018).

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2. Towards an environment management system (text body)

Sustainability consists of the integration of a set of actions based on the three pillars environmental, social, and economic. Achieving sustainable development means seeking quality of life in a way that disrupts the current pattern of development (Oláh et al., 2018). This concept of development is explicit in the 17 sustainable development goals (SGDs) that drive the 2030 agenda (United Nations, n. d.), seen as the guarantee of the planet itself and the basis of a «smarter model of development» (Rander et al., 2018). ISO 14001, published in, 1st September 1996 and with a latest edition dated from 2015 (ISO, 1996; ISO 2014) is widely considered the most important environmental certification (Sartor et al., 2019), and goes in and with the contents of SGDs making way for a common vision for humanity in a more executive approach.

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2.1. The ISO 14001

Although the norm is not new, there is a concern about the need to evolve towards an international, but more urgently, to a national/ internal regulation, forcing specifically Higher Education Institutions (IES) to engage in a most suitable role as drivers for sustainable development. Greensted (2011) alerts that Sustainability in Higher Education declarations have been signed globally, but are not enough as a measure to ensure executive procedure towards this driver role. Sustainability must be present in education management, in all dimensions, comprising both practices and curricula contents (Blanco-Portela et al., 2017).

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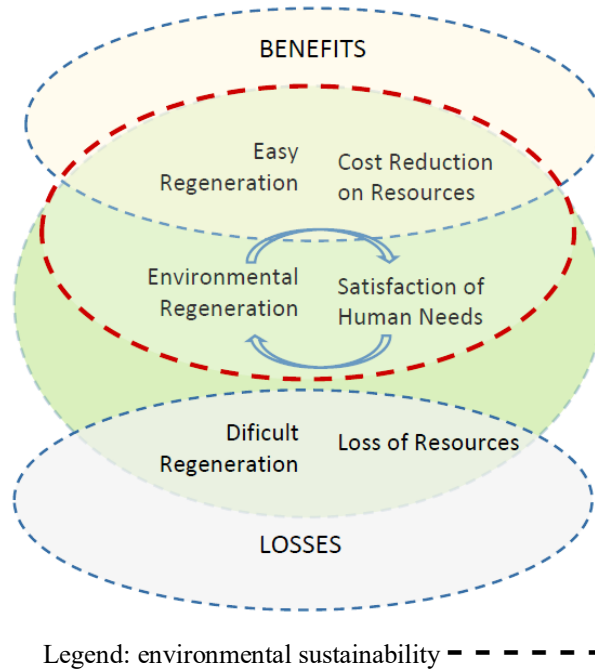


Fig 1. A Model for Environmental Sustainability Analysis.
 Source: Authors.

3. Methodology

The existing literature (Fonseca & Domingues, 2018) mentions some variables that should be considered in the implementation of these EMS, such as difficulties in measuring their efficiency, bureaucratic issues, higher costs, or lack of available advice or the generic nature of this ISO requirements.

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4. Results

When ISPGAYA started operating it's the building had two main types of lighting, which were downlights with two discharge lamps and discharge fluorescent

tubes. While the downlights were installed throughout the building but more frequently on the 3rd floor and above, the discharge tubes were installed mainly on the 1st and 2nd floors in indirect lighting due to their lower floor height than normal given the building's suitability developed for the ISPGAYA activities.

Table 1 presents the characterization of the lighting at the beginning of ISPGAYA's activities in February 2008 and also presents the installed power in the lighting circuits per floor and in the building as a whole.

Table 1. Types of lighting units existence in the building and also Power installed in lighting on each floor and all building in 2008.

Floor	Discharge DownLight units			Discharge tubulars units			Total power
	170mm 26watts	200mm 52watts	220mm 52watts	60cm 18watts	120cm 36watts	150cm 58watts	
1	5	15	28	2'	41	64	8.234W
2	36	26	0	25	33	59	7.018W
3	6	109	0	0	0	0	4.014W
4	11	102	0	0	0	0	3.870W
5	0	99	0	0	0	0	3.564W
6	0	59	17	0	0	0	3.220W
7	1	0	0	0	0	6	330W
Total Power							30.140W

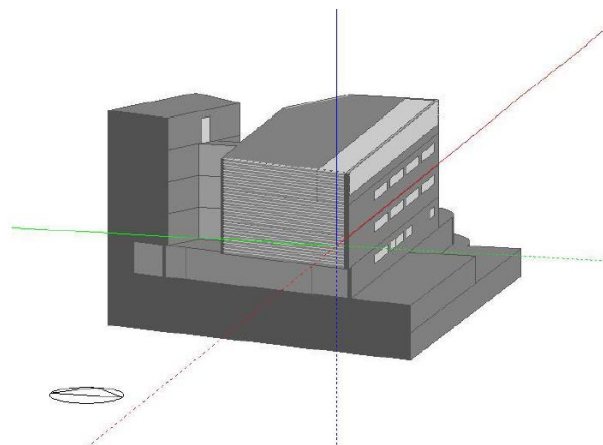


Fig 2. Geometrical model of ISPGAYA building, south view.

Source: Authors.

5. Conclusions

The results obtained allow the consolidation of the institutions' ESP (annex 1), in a perspective of short, medium and long-term planning of the set of measures and actions with results in the dimensions of environmental improvement and improvement of the institution.

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References (APA style 7th)

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