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Sustainable environmental management in a federal public university from the perspective of the UI GreenMetric

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Authors' notes'

The authors have no conflicts of interest to declare.

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Abstract

Objective: To analyze the development of environmental sustainability practices at the Federal University of Cariri from the perspective of the UI GreenMetric World University Ranking.

Methodology: It is a case study with a mixed approach, of an applied and descriptive nature. The qualitative approach was applied with a survey of the official documents of the HEI related to sustainability and the realization of a focus group with members of the sustainability management coordination. The quantitative approach aimed to measure the institution's degree of sustainability by completing the UI GreenMetric questionnaire.

Originality/Relevance: A detailed technical analysis is carried out on the institution's sustainable actions, identifying its weaknesses and potential in its sustainable management, contributing with reflections on the subject and proposing improvements to the practices currently developed.

Main results: It was evidenced that the HEI has already carried out and are in course several actions related to sustainability and that the theme has been strengthened in the organization. However, there is still no fully institutionalized environmental sustainability policy, which still lacks greater involvement on the part of the university's units and servers.

Contributions: The main challenges to be overcome were identified, especially with regard to the involvement of the units and servers, as well as the systematization of information and the need for greater incentives for research in the area, and suggestions for improvements were made in order to offer the university alternatives to advance. in the institutionalization of the theme and in the adoption of good environmentally sustainable practices.

Keywords: environmental management, sustainability, public administration, higher education institution, GreenMetric

GESTÃO AMBIENTAL SUSTENTÁVEL EM UMA UNIVERSIDADE PÚBLICA FEDERAL SOB A PERSPECTIVA DO *UI GREENMETRIC*

Resumo

Objetivo do Estudo: Analisar o desenvolvimento das práticas de sustentabilidade ambiental na Universidade Federal do Cariri sob a perspectiva do *UI GreenMetric World University Ranking.*

Metodologia: Trata-se de um estudo de caso com abordagem mista, de natureza aplicada e descritiva. A abordagem qualitativa foi aplicada com levantamento dos documentos oficiais da IES relacionados à sustentabilidade e da realização de um grupo focal com integrantes da coordenadoria de gestão da sustentabilidade. A abordagem quantitativa objetivou a mensuração do grau de sustentabilidade da instituição através do preenchimento do questionário *UI GreenMetric.*

Originalidade/Relevância: É realizada uma análise técnica pormenorizada sobre as ações sustentáveis da instituição, identificando as fragilidades e potencialidades desta em sua gestão sustentável, contribuindo com reflexões sobre o tema e propondo melhorias para as práticas atualmente desenvolvidas.

Principais Resultados: Foi evidenciado que a IES já realizou e estão em curso diversas ações relacionadas à sustentabilidade e que a temática vem sendo fortalecida na organização. Contudo, ainda não há uma política de sustentabilidade ambiental totalmente institucionalizada, carecendo ainda de maior envolvimento por parte das unidades e dos servidores da universidade.

Contribuições: Foram identificados os principais desafios a serem superados, principalmente no que diz respeito ao envolvimento das unidades e servidores, bem como a sistematização de informações e a necessidade de maior incentivo a pesquisas na área, sendo realizadas sugestões de melhorias visando oferecer à universidade alternativas para avançar na institucionalização da temática e na adoção de boas práticas ambientalmente sustentáveis.

Palavras-chave: gestão ambiental, sustentabilidade, administração pública, instituição de ensino superior, GreenMetric

GESTIÓN AMBIENTAL SUSTENTABLE EN UNA UNIVERSIDAD PÚBLICA FEDERAL DESDE LA PERSPECTIVA DE LA UI GREENMETRIC

Resumen

Objetivo del estúdio: Analizar el desarrollo de prácticas de sustentabilidad ambiental en la Universidad Federal del Cariri en la perspectiva del Ranking Mundial Universitario UI GreenMetric.

Metodología: Se trata de un estudio de caso con enfoque mixto, de carácter aplicado y descriptivo. Se aplicó el enfoque cualitativo con un levantamiento de los documentos oficiales de las IES relacionados con la sustentabilidad y la realización de un grupo focal con integrantes de la coordinación de gestión de la sustentabilidad. El enfoque cuantitativo tuvo como objetivo medir el grado de sostenibilidad de la institución mediante el llenado del cuestionario UI GreenMetric.

Originalidad/Relevancia: Se realiza un análisis técnico detallado de las acciones sustentables de la institución, identificando sus debilidades y potencialidades en su gestión sustentable, aportando reflexiones sobre el tema y proponiendo mejoras a las prácticas actualmente desarrolladas.

Principales resultados: Se evidenció que la IES ya realizó y están en curso varias acciones relacionadas con la sustentabilidad y que el tema se ha fortalecido en la organización. Sin embargo, aún no existe una política de sustentabilidad ambiental totalmente institucionalizada, la cual aún carece de un mayor involucramiento por parte de las unidades y servidores de la universidad.

Contribuciones: Se identificaron los principales desafíos a superar, especialmente en lo que se refiere al involucramiento de unidades y servidores, así como la sistematización de la

información y la necesidad de mayores incentivos a la investigación en el área, y se propusieron mejoras para ofrecer la alternativas universitarias para avanzar en la institucionalización del tema y en la adopción de buenas prácticas ambientalmente sustentables.

Palabras-clave: gestión ambiental, sustentabilidad, administracion publica, institución de enseñanza superior

Introduction

Economic and technological development has led, over time, to a progressive increase in the consumption of natural resources, causing relevant and reckless changes to the environment. Through the time, this fact was reflected in the decrease and/or depletion of resources used as raw materials, causing environmental damage and directly affecting the economy (Scannavino & Coelho, 2019).

Many studies and debates about environmental management actions and sustainable methods in the development of organizations gained strength at the end of the 20th century. Greater pressure from stakeholders and established environmental standards made governments and institutions pay attention to constant changes in key-markets, seeking new forms of management and generating greater ecological awareness (Alievi & Antinarelli, 2015).

In line with this thought, in the early 1970s, a movement towards an international position in search of sustainable development was led by the United Nations (UN). In 1972, it provided a major milestone for the international environmental discussion through the United Nations Conference on the Human Environment, which became known as the Stockholm Conference, which attracted attention from all over the world (Souto, 2020).

With the intention of inserting public organizations in a context of sustainability and with the intention of being more efficient with environmental balance, the Brazilian government developed the Environmental Agenda in Public Administration (A3P), in 2002. This was based

on the guidelines of the Global Agenda 21 and was designed as a program of voluntary adherence by the organizations (Araújo, Ludewigs & Carmo, 2015).

Also included in debates surrounding environmental management, Higher Education Institutions (HEIs) present themselves as directly responsible for implementing an environmentally sustainable culture, whether in their curricular components or in their administrative practices. Over time, universities sought greater involvement with the topic, expressing their participation through declarations, treaties, events and environmental agreements, in addition to addressing the development of the SDGs within their scope in their planning.

HEIs have great relevance throughout the world in the construction of thoughts, proposals, research, analysis, and fundamental knowledge to mobilize civil society and to intervene in environmental problems. The superlative relevance of HEIs in developing the topic in their spaces and in the search for a strategic growth model focused on sustainable development is increasingly perceived.

In this sense, Feitosa (2011) and Freitas *et al.* (2012) believe that in addition to playing a prominent role in society as promoters of the dissemination of knowledge and as agents of social transformation, and must have their actions guided by the search for sustainable development, universities are major consumers of goods and services and seen as “small towns”.

In order to find ways to support the development of sustainable actions in universities, methodologies, tools, rankings and indicators emerged aimed at measuring the effectiveness of these practices and a situational analysis of sustainability in HEIs (Scannavino & Coelho, 2019). One of these tools is the UI GreenMetric World University Ranking (Malheiros & Ambrizzi, 2020).

The implementation of sustainable principles in HEIs must, in addition to permeating teaching, research and extension activities, be present in their routines (Fonseca, Macdonald,

Dandy & Valenti, 2011). Although the universities contribute to the production of knowledge about sustainability, in most cases they do not internalize sustainable practices in their management (May, 2017).

The sustainable environmental management of HEIs still needs improvements, and the Federal University of Cariri – UFCA, the focus of this work, is inserted in this context. Creating an environmentally responsible culture offers benefits to the environment, the community and the institution, adding value to its image and achieving respect from society (Espinheira, 2014).

UFCA presents itself as a protagonist of sustainability in its environment, declaring in its mission the commitment to sustainable territorial development, in its vision "*to be a university of excellence in education for sustainability through Teaching, Research, Extension and Culture*" and also including actions aimed at sustainable management in its Institutional Development Plan – PDI. However, even though UFCA is committed to being an institution that promotes environmental sustainability, the provisions in its planning do not guarantee that academic/administrative units are incorporating sustainability into their scope.

This research stands as another tool to encourage changes related to the environment, presenting important scientific value, contributing academically and as a mechanism of action, proposing a more in-depth debate about the perspective of sustainability within the scope of an HEI, using a tool metric aimed specifically at this type of organization, providing opportunities for reflection on the topic in these environments and serving as a basis for institutional planning, as it presents weaknesses and potential.

This study, therefore, has as its central objective to analyze the development of environmental sustainability practices at UFCA from the perspective of the UI GreenMetric World University Ranking and proposes to carry out a case study at UFCA, in order to identify how the institution incorporates sustainable management within its scope.

Theoretical foundation

Sustainability is achieved when there is economic growth, concomitantly, with social justice and efficiency in the use of natural resources (Alshuwaikhat & Abubakar, 2008). Oliveira and Santos (2015) say that sustainability is seen as a property of the system, whereas sustainable development refers to political activities related to reinforcing this property. For Robinson (2004), sustainability is a quality that arises from debates about what type of world the population wants to live in now and in the future, collectively.

Elkington (2012) infers that sustainability is what guarantees that today's actions will not limit the economic, social and environmental options available to future generations. This same author, in 1997, in his book Cannibals With Forks, pointed out that sustainable development must unite the dimensions: economic, social and environmental. This sustainability tripod became known as the Triple Bottom Line – TBL.

Beyond the dimensions presented by Elkington (2012), Sachs (2002) presents eight dimensions of sustainability: social; cultural; ecological; environmental; territorial; economic; politics (national) and politics (international).

In the center of debates related to sustainable environmental management, the role of education and HEIs stands out in the search for the insertion and development of this theme in the environment in which they operate. Universities have sought over time to implement their commitment to sustainable development. Initially, with adherence to documents and declarations of global reach. Afterward, with the defense that sustainability must be present in all its activities. HEIs, considered as spaces where knowledge is disseminated and professionals are trained for the world of work, play a fundamental role in the issue of environmental sustainability (Fleig, Nascimento & Michaliszyn, 2021).

Universities can be equated to small cities, considering the routine of each one and the number of people who circulate in these institutions every day. As a result, such organizations end up causing impacts on the environment in which they operate, whether through the generation of waste and environmental degradation for the construction of their units and/or the

fact that they are large consumers of water, electricity and fuels (Alshuwaikhat & Abubakar, 2008).

In line with this thought, Viegas (2014) believes that a university, considered in an environmentally sustainable context, adds values and cares for the environment, that is concerned with the quality of life and well-being of the entire society that is in your surroundings and with the correct use of your budget.

According to the aforementioned author (2014), in addition to clearly stating in their official documents the commitment to effective sustainable management, HEIs that seek sustainability must encourage the entire academic community to critically reflect on environmental problems; address the concept of sustainability in research and curricular components; plan sustainable actions and policies and encourage cooperation agreements between local agents to develop environmentally sustainable practices.

Guimarães and Bonilla (2018) say that to be treated as a sustainable organization, an HEI needs to follow certain standards and present peculiar characteristics. In addition to working in education focused on sustainability, it must develop actions to implement environmental management in its daily lives. For Santa and Pfitscher (2016), a sustainable university must mainly consider the educational and research aspects of the subject, such as curricular components and courses, and also pay attention to the infrastructure and development of sustainable buildings.

From a more comprehensive perspective, Shriberg (2002) points out that a sustainable HEI must necessarily integrate the concepts of correct environmental management in its fundamental aspects, which are teaching, research and extension. For him, in addition to integrating curricular components, environmental sustainability must be reflected in tangible scientific research actions and also in projects that aim to integrate with the society in which it operates, in ecological, economic and social terms.

The fact is that implementing a culture focused on sustainable development is a gradual process, especially in complex organizations such as universities. Tauchen and Brandli (2006) consider that HEIs are similar to small urban centers and that beyond activities related to teaching, research, extension and culture, there are administrative activities that manage their functioning, such as academic and administrative units, convenience centers, university restaurants, accommodation, among others.

The same authors mentioned above (2006) point out that for the correct functioning of HEIs, they need basic infrastructure, such as an energy supply network, water, sanitation, access roads, parking lots and rainwater collection, for example. Currently, Brazilian universities are materializing their intentions to improve the environmental management of their campuses through various official documents. One can cite, as an example, the actions foreseen in the PDI, Sustainable Logistics Plan – SLP, Solid Waste Management Plan, internal regulations on sustainability management policy, and good practice manuals, among other documents produced by HEIs (Ávila , Madruga & Beuron, 2016).

The understanding that human actions are capable of causing impacts on the environment in a way that compromises current and future existence means that institutions hold greater responsibility for their practices. Therefore, to mitigate the damage caused by human activity, there is an urgent need to include environmentally sustainable management in organizations. Consequently, new tools and indicators for measuring environmental sustainability have emerged (Wachholz, 2017).

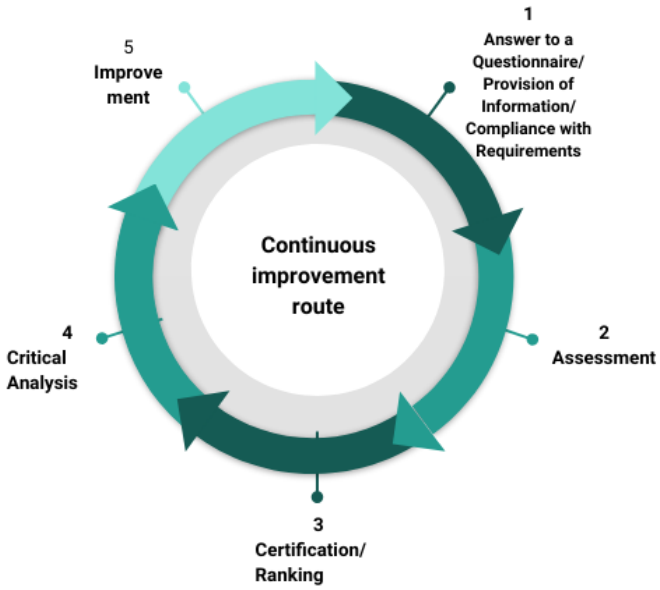
In this sense, the use of situational measurement instruments for environmental sustainability in universities appears to be, in addition to being necessary, indispensable to provide support for planning and decision-making by managers and for the better development of environmental management in HEIs. Measurement tools contribute to the practical implementation of actions planned by universities, transversalizing the theme of sustainability, creating a feeling of responsibility on the part of academic and administrative units and also

contributing to greater transparency and communication on the topic, being a means for HEIs to express their commitment to the environment and society (Góes, 2015).

Figure 1, adapted from Góes (2015), presents the route of continuous improvement through participation in an environmental sustainability assessment program.

Figure 1

Route to continuous improvement through participation in an environmental sustainability assessment program



Source: Adapted from Góes (2015)

One of these tools, which will support this research, is the UI GreenMetric World University Ranking, which is an important tool for measuring sustainability and is specifically aimed at universities. Created by the University of Indonesia, in 2010, with the collaboration of scientists from all over the world, in its first year of application, 95 universities from 35 countries used the metric (Malheiros & Ambrizzi, 2020).

GreenMetric has a methodology that integrates criteria and indicators related to environmental sustainability, providing results considering structural conditions and sustainable management actions. This allows, for example, institutions to improve their practices through benchmarking and also by identifying the level at which they are located, making it possible to analyze the strengths and weaknesses of institutional sustainability (Malheiros & Ambrizzi, 2020).

Sustainability measurement instruments provide an assessment that is consistent with the reality of each institution, enabling extensive reflection on its limitations, and potential and also on the efforts undertaken to seek sustainable institutional development. Therefore, the development of research of this nature at UFCA offers the opportunity to better understand the current stage of development of the topic at the institution, as well as which paths the HEI can follow to evolve and institutionalize sustainable management in its daily life

Methodology

This is a case study with a mixed approach, with analysis of qualitative and quantitative data, of an applied and descriptive nature. First, qualitative research was carried out, starting with the survey of official UFCA documents related to sustainability, followed by the formation of a focus group with the UFCA sustainability management coordinator. Subsequently, the quantitative method was used to measure the degree of sustainability of the HEI from the perspective of the indicators and scores proposed in the UI GreenMetric. For this purpose, information was collected on the official portal and with 9 sectors of the institution, by sending emails, between May and June 2022.

Data collection for the research is based at the Federal University of Cariri (UFCA), based in the city of Juazeiro do Norte, in Ceará, and was carried out between February and July 2022. UFCA is an agency linked to the Ministry of Education (MEC) and created by Law nº. 12,826, on June 5, 2013, for the dismemberment of the Cariri campus of the Federal University of Ceará (UFC).

The university has 5 campuses, located in 5 cities in Cariri, Ceará: Campus Juazeiro do Norte, which is the institution's headquarters campus; Faculty of Medicine - FAMED, located in Barbalha; Campus Crato, which houses the Center for Agricultural Sciences and Biodiversity, located in the city of Crato; Brejo Santo Campus, where the Educator Training Institute is located, in the city of Brejo Santo; and the Icó Campus, where the UFCA Distance Education Center is located, in the city of Icó.

UFCA's organizational structure is divided into higher management, academic collegial bodies, academic management and administrative management, encompassing academic and administrative units. The institution bases its actions on four pillars: teaching, research, extension and culture, with main objectives of social inclusion and sustainable territorial development.

Among the units mentioned above, the dean of planning and budget (PROPLAN) is made up of seven coordinators, one of which is the Sustainability Management Coordination (CGS), which aims to identify and stimulate the actions/relationships of the academic community and university management projects/models to align them with the theme of sustainability.

The study sample for the qualitative stage was made up of 04 employees from the university's sustainability management coordination team (CGS) who participated in the focus group. For the quantitative data collection stage, the 06 academic units and 08 administrative units of UFCA were involved and participated by providing UFCA public information from the perspective of GreenMetric. The academic units are: Center for Agricultural Sciences and Biodiversity (CCAB), Center for Science and Technology (CCT), Center for Applied Social Sciences (CCSA), Institute for Educator Training (IFE), Interdisciplinary Institute of Society, Culture and Arts (IISCA) and Faculty of Medicine (FAMED).

The administrative units are: Pro-Rector of People Management (PROGEP), Pro-Rector of Administration (PROAD), Pro-Rector of Extension (PROEX), Pro-Rector of Undergraduate

Studies (PROGRAD), Pro-Rector of Research, Postgraduate and Innovation (PRPI), PROPLAN, Infrastructure Directorate (DINFRA) and Logistics and Operational Support Directorate (DLA).

After screening UFCA's academic and administrative units, data collection was divided into three stages: 1) descriptive analysis of official documents on UFCA's sustainability; 2) focus group with the university sustainability management coordination team (CGS) and 3) Completion, by the author of the UI GreenMetric World University Ranking questionnaire.

The data collected through official UFCA documents were analyzed using the qualitative method of descriptive analysis and related to the recorded speeches of the focus group participants, with the aim of describing management policies and practices aimed at environmental sustainability and identifying the potentialities and weaknesses in the sustainable management strategies adopted by UFCA.

The data obtained through academic and administrative units was organized into the six GreenMetric categories using Google Sheets. To carry out the calculations referring to the indicators of all categories, the formulas and guidelines for the answers included in the UI GreenMetric World University Rankings 2021 Guideline were used.

Results and discussion

Descriptive Analysis of Sustainable Practices at UFCA

The UFCA PDI (2016 - 2020) places, in its sub item that deals with “strategic reference and map”, the declaration, in its organizational vision, that it intends to “be a university of excellence in education for sustainability through Teaching, Research , Extension and Culture”. Its values highlight its commitment to social responsibility and sustainability. It further declares that its mission is “to promote critical and socially committed knowledge for sustainable territorial development”.

From the study of the points relating to sustainability in the PDI, it was possible to see that the institution's planning addresses environmental management in a very significant way,

with the forecast for carrying out many projects and actions focused on the topic. Considering that the document was the first PDI in the history of the institution, it can be seen that management had the vision of directing the university towards this path since its conception.

However, the inclusion of sustainability in the strategic framework is not a guarantee that the actions will reach the entire academic community. Although the institution presents the theme as a basis for proposing guidelines for academic activities, in consultation with the institution's SIGAA, it was identified that only 5.73% of the curricular components offered in the last year are related to the theme. It is worth noting that the majority of these are concentrated in the Center for Agricultural Sciences and Biodiversity, in the agronomy course and in PRODER, which by their nature already offer subjects related to the environment and environmental management. Therefore, for an institution that declares the vision of being a “university of excellence in education for sustainability”, a review of the course training line may be necessary.

Although the PDI also proposes that the academic and administrative sectors collaborate with the development of environmentally sustainable management, the focus group carried out in this research made it clear that greater involvement is still needed on the part of the units, which end up receiving some demands related to the theme such as being something outside of what is naturally attributed to the position held. This situation was actually experienced during the data collection phase of this research.

The existence of CGS/PROPLAN, which is highlighted in the PDI, is of great relevance to the institution. In fact, having a sector at coordination level responsible for the sustainable environmental management of an HEI is of fundamental importance for the development of the theme in the organization. Souza (2020) states that it is unusual among universities to create sectors responsible for environmental management with a high hierarchical position and this is a positive point for UFCA.

As observed during the focus group, the coordinator appears to be the main link that seeks to bring to the community the sense of importance that environmental sustainability has. The sector is a reference in the institution in proposing, guiding, executing and monitoring actions that can increase sustainability at UFCA. Furthermore, it is responsible for providing and receiving information from control bodies related to the environment.

The team has great synergy and the members have a lot of knowledge on the subject. However, the coordination is currently made up of a small team. It was clear, through the focus group, that this ends up causing the workload to be high and many actions to still not be put into practice. It is necessary to strengthen the workforce with even more professionals with knowledge on the subject, so that actions can be better debated, executed and monitored.

Records were found in other HEIs in sectors related to the environment at the coordination or division level. Institutions that have a high profile in environmental management, such as UNIFESP, UFLA, and USP, have directorates of superintendents in their organizational structure to deal with the topic. UFCA also has the potential to - and perhaps is necessary for - creating a management board for sustainability, thus offering greater support (personal, budgetary, technological) and contributing to achieving the goals proposed in the PDI.

Another important UFCA official document in the context of sustainability and which is cited in the institution's PDI is the Sustainable Logistics Plan – PLS (2018). The Document is based on Normative Instruction nº. 10, of November 12, 2012, of the extinct Ministry of Planning, Budget and Management, which establishes rules for the preparation of Sustainable Logistics Management Plans (PLS), indirect, autonomous, foundational Federal Public Administration and in dependent state-owned companies, as determined by subparagraph “b” of item I of art. 11 of Decree no. 7,746, of June 5, 2012.

UFCA has a PLS that was approved through Resolution nº. 24/CONSUP, of August 16, 2018. As described in the document, UFCA's PLS is aligned with the SDGs of the 2030 agenda and institutional strategic planning, the PDI and the sustainability management policy. The plan

was designed with the idea of guiding sustainable practices to be implemented, monitored and verified, to achieve institutionalization at the university.

As established by IN nº 10/2012 of the MPOG, the results achieved from the actions defined in the PLS must be published every six months on the bodies' websites. Therefore, UFCA publishes action monitoring reports every semester. In February 2022, CGS/PROPLAN published the most recent UFCA PLS monitoring report. The report presents the results achieved in 2021.

As informed by the CGS/PROPLAN team in the focus group by participant I, “the PLS monitoring report allows the coordination to interact directly with other sectors and is currently the main means of communication between the coordination and the units”, to obtain information regarding environmental management and propose actions and define objectives related to the topic. As reports are published, more actions are published and others are strengthened, which can make the topic gain more and more space in the academic community.

Considering the objectives proposed by the PLS when it was published, it was clear that records of significant advances in solid waste management were found, with the adoption of selective citizen collection, the adoption of renewable energy sources, the installation of the solar plant on the Juazeiro do Norte campus, and the policy of reducing electricity and water consumption, with the use of efficient equipment. However, the practice of purchasing disposable cups and consuming A4 paper still remains. These practices can be discouraged through an awareness and training program with employees.

The debate in the focus group ratified the proposed methodology for monitoring actions, however it presented challenges to be overcome. It was reported that some UFCA units still have some resistance to providing information and having greater engagement with the issue. According to members, it is clear that some sectors see data requests as something that goes beyond their routine duties, being received by them as something outside their activities.

Aiming to overcome this barrier, the members of the focus group reported that in meetings to monitor the sustainable logistics plan, which is carried out with the units, the sectors are encouraged to propose their metrics related to the topic, so that they have the feeling of being part of of the process. Furthermore, in the participants' speech, it is necessary to make the sectors understand that requests for information on the topic, the changes that are suggested and the monitoring that is carried out are issues that are studied, necessary and in most cases are already the result of legal requirements. .

Another document of great relevance at the institution on the topic of sustainability is the “Sustainability Catalog”, prepared by CGS/PROPLAN with the contribution of the UFCA academic community. The document presents the actions and projects linked to sustainable development that were developed in 2021 at the university, identifying the relationships between the actions and the UN's sustainable development objectives – SDGs. The document was made public in February 2022.

Just like the document that presents PLS monitoring, the sustainability catalog is a very important instrument for transparency and dissemination of the university's sustainable actions. It is clear that the catalog encompasses actions that go beyond those described in the PLS, and equally encourages the academic community to participate by sending records of their environmentally sustainable practices. However, as reported in the focus group, some barriers to be overcome were identified.

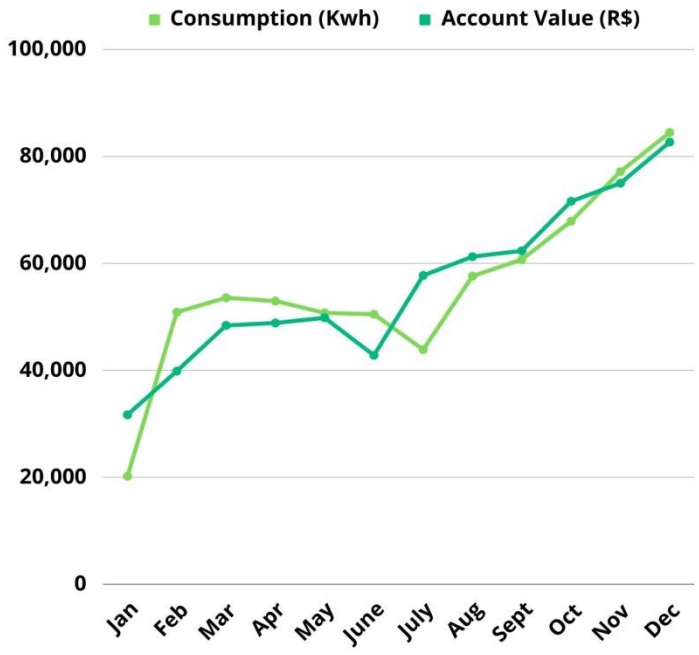
For greater strengthening and adherence by the units to both the PLS monitoring report and the sustainability catalog, an on-site visit by CGS/PROPLAN would be appropriate to learn about the routine of each sector, presenting the importance of these instruments and motivating employees to carry out sustainable actions in their routine activities. Furthermore, a training plan focused on the topic would certainly bring improvements to achieving the objectives proposed in the PDI and PLS and to engaging the workforce. However, this would require an increase in the sector's staff.

In 2019, UFCA joined the Environmental Agenda in Public Administration – A3P program and, according to information on the institution's official website, is part of the 14 federal universities that partnered with the Ministry of the Environment to receive technical support to implement and operationalize the agenda at IES. According to the membership agreement, which is valid for 5 years and can be renewed, the university will work to promote awareness of an anti-waste culture and the coherent use of natural resources and public goods.

In March 2022, the institution released data from the first year of monitoring the program, presenting important data regarding energy efficiency, water, consumption of disposable and paper cups, transportation, waste, sustainable hiring and quality of life at work. Figures 3 and 4, below, show energy and fuel consumption at the university in 2021.

Figure 2

Energy consumption and bill value in 2021

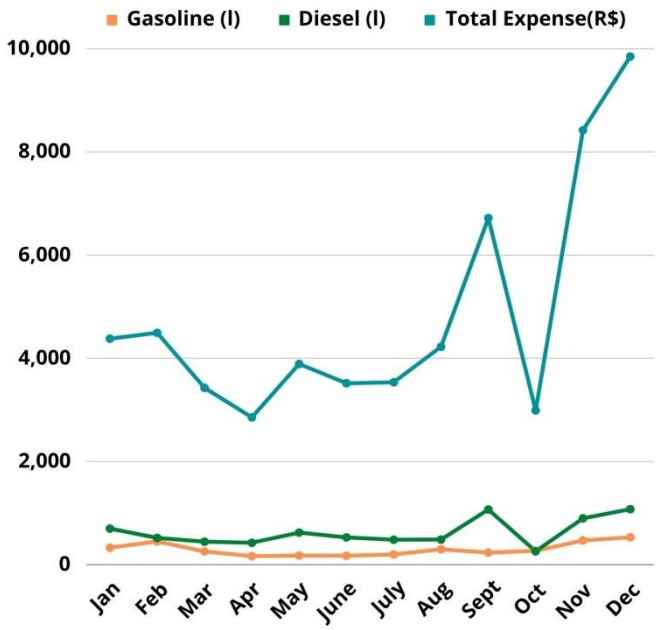


System – RESSSOA (2022**)**

Source: Adapted from UFCA General report on the body's information: A3P Monitoring

Figure 3

Fuel consumption and amounts paid in 2021



Source: Adapted from UFCA. General report on the body's information: A3P Monitoring System – RESSSOA (2022)

UFCA's adherence to A3P is of great importance for the institution, since as discussed in the focus group, the IES did not yet participate in any similar monitoring instrument. In addition to receiving recognition as an institution that participates in the agenda, the university's first participation has already provided a diagnosis of the actions carried out, through receipt of the report sent by the Ministry of the Environment, after sending information from the university.

As with monitoring the PLS, as highlighted in the focus group, there is difficulty in obtaining information related to A3P, to be sent to the Ministry of the Environment, mainly due to the little engagement of the sectors in demand. This is in line with what Peixoto (2018) pointed out, stating that organizations present difficulties in implementing the agenda, which can be external, such as the lack of budgetary incentives on the part of the government, or internal,

such as the lack of involvement of employees. employees and their lack of sensitivity to environmental issues.

By joining A3P and the consequent monitoring of actions and receipt of the seal by the agenda, it will be possible, in addition to external recognition, to obtain greater recognition from the university's academic community. Furthermore, as discussed in the focus group, there is the intention to submit proposals to compete for the A3P award for best sustainable actions developed by public institutions, which will strengthen this approval by the institution's actors.

It is clear that the university makes significant efforts to develop sustainable environmental management within its scope and that, through the documents analyzed here, it was possible to understand how this has been happening. The published reports, the practices disclosed, and the actions that are proposed show signs that the IES seeks to create an environmentally sustainable university culture. However, it faces challenges that end up arising in the change processes in organizations, such as resistance, lack of engagement, and knowledge of the subject. Although significant for an institution created nine years ago, the results can be enhanced mainly through education for sustainability and greater involvement of staff and students.

The focus group carried out in the research was of fundamental importance to understand how the actions are being developed and to identify difficulties faced in this process, which are not noticeable just by viewing the published documents. It was possible to understand that many sustainable actions already have a certain maturity and are frequently monitored by the coordination, such as the PLS monitoring report, selective citizen collection, and monitoring of chemical products. The team highlighted actions that they believe have great potential, such as the sustainability catalog and work based on the SDGs, which are already somewhat practiced in Pro-Rectorial projects such as PRPI and PROEX.

Concerning actions that are in the planning phase and that have not yet been executed, the coordinator highlighted their desire to participate in the UI GreenMetric World University

Ranking, as they understand, as discussed, to be an important tool for measuring the level of sustainability of universities and for recognizing that this type of tool can be used to guide activities related to sustainable management. As informed, the team even sought information about the tool from another national institution that already uses the tool, however, due to the low number of personnel, they ended up not being able to participate officially.

Furthermore, the coordination's objective was to prepare a general CGS report, with the actions carried out by the coordination, as well as improving the management of all the institution's waste, including that generated by the university restaurant, which is currently the responsibility of the food supply company. Also, an important need to develop the feeling in students and employees of treating sustainability not as a requirement, but as something that should be in everyone's routine, whether inside or outside the university, making environmental management an institutional culture.

Relating the publications of official documents, their construction methodology, and the information collected in the focus group, it was possible to see that, the theme of sustainable environmental management, the cultural issues and resistance to change are sensitive issues to be addressed. developed at the institution, but which inevitably requires time. As stated by Fleig, Nascimento and Michaliszyn (2021), the progress of educational institutions in integrating environmental sustainability is demonstrably slow. To overcome these challenges, it is necessary to implement strategies to raise awareness and train the academic community on the topic of sustainability, which in a certain way CGS has made efforts to do.

Disseminating the sustainability catalog and the PLS report to the academic community through events, symbolically rewarding the best practices of academic and administrative units and keeping the manual of sustainable good practices updated, can be actions that bring students and employees closer to the UFCA to the theme and can awaken these greater concerns about the environment.

Strengthening the CGS/PROPLAN workforce is also necessary. Incorporating other employees with knowledge and experience on the subject can enable the sector to plan, execute and monitor environmentally sustainable actions even better, meaning that more and more practices are incorporated into the institution's routine, making UFCA an institution recognized as a reference on the subject.

Developing sustainably demands a focus on interdisciplinarity, considering that it brings together the demand for knowledge and actions that strengthen work between teachers, managers and students. Another fundamental factor in the integration of sustainability in universities is the development of partnerships between HEIs, governments and the business community, in addition to the fact that for the theme to be established in the midst of a dynamic conception in institutions, new advances and studies are essential (Fleig, Nascimento & Michaliszyn, 2021)

Questionnaire *Ui Greenmetric World University Ranking* 2021

According to the results obtained from completing the questionnaire, the consolidated result of UFCA's simulated participation in GreenMetric is presented in Table 1 below

Table 1

Consolidated result of the UFCA simulation in GreenMetric

Category and Indicators	Maximum score	Score Obtained
Environment and Infrastructure (SI)	**1500**	**775**
SI 1	200	50
SI 2	100	0
SI 3	200	50
SI 4	100	100
SI 5	200	200
SI 6	200	50
SI 7	100	0
SI 8	100	75
SI 9	100	100
SI 10	100	50
SI 11	100	100
Energy and Climate Change (EC)	**2100**	**1075**
EC 1	200	200
EC 2	300	0
EC 3	300	75
EC 4	300	75
EC 5	200	200
EC 6	200	150
EC 7	200	200
EC 8	200	0
EC 9	100	75
EC 10	100	100
Waste (WS)	**1800**	**1350**
WS1	300	300
WS2	300	300
WS3	300	300
WS4	300	300
WS5	300	75
WS6	300	75
Water (WR)	**1000**	**700**

Continued on the next page

WR 1	200	100
WR 2	200	50
WR 3	200	200
WR 4	200	150
WR 5	200	200
Transportation (TR)	**1800**	**750**
TR 1	200	0
TR 2	300	300
TR 3	200	100
TR 4	200	0
TR 5	200	0
TR 6	200	0
TR 7	200	50
TR 8	300	300
Education and Research (ED)	**1800**	**1050**
ED 1	300	150
ED 2	200	50
ED 3	200	150
ED 4	200	100
ED 5	200	0
ED 6	200	200
ED 7	100	100
ED 8	100	100
ED 9	100	100
ED 10	100	100
ED 11	100	0
Total	10000	5700

Quantitative analysis of the questionnaire data shows that UFCA achieved 5,700 points in total, which corresponds to 57% of the maximum GreenMetric score. This shows that although the institution is making efforts to develop sustainability within its scope, there is still a lot to be improved. Considering the score obtained, UFCA would be ranked 461st in the world rankings and 20th among participating Brazilian institutions.

Table 2 presents the comparison between the first places of all HEIs, those that are classified in one position immediately above and below where UFCA would be classified, as well as the comparison with the worst university positioned in the general classification.

Table 2

UFCA simulated general classification in GreenMetric 2021

General classification	HEI	Country	Score	SI	EC	WS	WR	TR	ED
1ª	Wageningen University and Research	Netherlands	9300	1325	1825	1800	1000	1550	1800
460º	Federal University of Alfenas	Brazil	5700	850	975	1275	550	1000	1050
461º	**Federal University of Cariri**	**Brazil**	**5700**	**775**	**1075**	**1350**	**700**	**750**	**1050**
462º	University of Passo Fundo	Brasil	5675	825	1025	1200	650	825	1150
956º	University of Harapan Medan	Indonesia	300	200	0	0	100	0	0

Table 3 presents the best placed in the ranking among Brazilian universities, the placement of institutions that are classified one position immediately above and below where UFCA would be and the worst institution classified among the HEIs in the country.

Table 3

UFCA simulated classification in GreenMetric 2021: Institutions in Brazil

Classification	HEI	Score	SI	EC	WS	WR	TR	ED
1ª	University of São Paulo	8700	1350	1475	1650	950	1675	1600
19º	Federal University de Alfenas	5700	850	975	1275	550	1000	1050
20º	**Federal University of Cariri**	**5700**	**775**	**1075**	**1350**	**700**	**750**	**1050**
21º	University of, Passo Fundo	5675	825	1025	1200	650	825	1150
40º	Santo Agostinho College (Itabuna-Bahia Unit)	1225	450	100	225	250	200	0

Table 4 shows that considering the maximum score for each axis, UFCA achieved better performance in the waste (WS) and water (WR) categories, while the worst performances were in the transport (TR) and energy and climate change (EC) categories. Agreeing with what was presented in the official UFCA documents, as well as what was discussed in the focus group, it is clear that waste management in the institution is indeed being well developed.

Table 4

Performance by UFCA category in GreenMetric

Category	Maximum Score	Score Achieved	Percentage
SI	1500	775	51,6%
EC	2100	1075	51,1%
WS	1800	1350	75%
WR	1000	700	70%
TR	1800	750	41,6%
ED	1800	1050	58,3%

Also, as a positive point, it is worth highlighting that in all categories UFCA obtained maximum scores in, at least, two indicators. However, in many indicators the university performed poorly and did not score either because it did not have enough data or because it was not possible to perform the calculation. In 4 of the 6 categories, the HEI had indicators that were not scored. It was identified that 41% of the indicators had a result lower than 50%, representing the institution's weakness in important aspects of the questionnaire.

As one of the objectives of this research is to identify the weaknesses and potentialities in sustainable management strategies at the university, it is important to highlight the indicators in which the institution presented the most difficulties and which certainly have great potential for improvement and adaptation. Table 1 presents the indicators that, even though there is information about them, did not perform satisfactorily to the point of achieving at least a minimum score.

Table 5

Indicators that UFCA presented information, but unsatisfactory for scoring

Category	Indicator
SI	Percentage of building operation and maintenance activities during the COVID-19 pandemic
TR	Proportion of the total parking area compared to the total area of the Campus
ED	Number of student organizations related to the environment and sustainability
ED	Number of sustainability-related startups

Table 2 lists the indicators that were not scored because there was not enough information to answer the questions or because the indicators did not yet adapt to the reality of the institution. Table 3 presents the indicators in which the institution showed very significant results, obtaining maximum scores and which have the potential to be strengthened and developed on a larger scale.

Table 6

Indicators not scored due to non-adaptation to the reality of the HEI or lack of information

Category	Indicator
SI	Total campus area covered by forest vegetation
SI	Implementation of the Smart Building program
EC	Provide the total carbon footprint relative to the total population of the Campus (in tons)
TR	Proportion of total vehicles (cars and motorcycles) compared to the total population of the Campus
TR	Proportion of zero emission vehicles (ZEV) compared to the total population of the Campus
TR	Mobility program designed to limit or decrease on-campus parking area over the past 3 years

Table 7

Indicators with significant results

Category	Indicator
SI	Total area of the campus for water absorption in addition to the forest and planted vegetation
SI	The total area of open space divided by the total campus population
SI	Security and security facilities
SI	Conservation: plants, animals and wildlife, genetic resources for food and agriculture secured in medium or long-term conservation facilities
EC	Installation of energy efficiency equipment
EC	Relationship between renewable energy production and total energy consumed per year
EC	Program to reduce greenhouse gas emissions
EC	Impactful university program(s) on climate change
WS	University waste recycling program
WS	Program to reduce paper and plastic consumption on Campus
WS	Organic waste treatment
WS	Inorganic waste treatment
WR	Installation of devices for efficient water consumption
WR	Percentage of additional handwashing and sanitation facilities during the COVID-19 pandemic
TR	Transport services
TR	Pedestrian path on campus
ED	Existence of a sustainability website managed by the university
ED	Existence of a published sustainability report
ED	Number of cultural activities on campus (e.g. Cultural Festival).
ED	Number of university programs to address the COVID-19 pandemic
ED	Number of sustainability community service projects organized and/or involving students

Thus, it was found that in most indicators that UFCA did not reach the minimum score, the institution either did not have information available or the questionnaire methodology was not appropriate to the institution's reality.

However, there are still indicators that the available information was not satisfactory to score minimally, which shows that these are issues to be better explored by the university. However, it is worth highlighting the points in which the institution performed better in the questionnaire. It was observed that these indicators are aligned with what is published in the official documents of the IES and with what was recorded in the focus group carried out in this research. Many of the highlighted actions were in fact foreseen in the UFCA planning instruments. These must be subject to continuous improvement, monitoring and adaptation to current and future realities

Conclusions

With this study it is concluded that UFCA has already carried out and are ongoing several actions related to sustainability and that the topic has been strengthened within the organization. However, there is still no fully institutionalized environmental policy, which still requires greater involvement on the part of university units and employees. From the analysis of the university's official documents, the importance and commitment at a strategic level to UFCA's environmental management became evident. Furthermore, the focus group carried out in the research ratified the actions that are officially published by the IES, however, it presented the challenges encountered in this process, something that is not possible to be perceived just by reading the documents.

The main difficulties encountered in obtaining data for this study were related to the university's lack of systematization of some information required by GreenMetric. Also, due to the fact that some indicators proposed in the questionnaire do not adapt to UFCA's reality, which in a certain way harmed the institution's performance in the metric. This reinforces the

idea that measurement tools such as the one used in this research must take into account the particularities of each institution and the environment in which they are located.

Based on the research results, it was possible to see that the most comprehensive document related to environmental issues is the PLS, although the PDI and other documents also deal with the topic. UFCA's PLS addresses perspectives that are required by the country's legislation, but which are also guided by good practices experienced in other organizations. However, it is suggested that the document may undergo a review, addressing the issues observed in this study, reaching what were identified as weak points in the institution's sustainable management, inserting GreenMetric indicators

From this study, it was possible to realize that in order for there to be progress in the implementation of a sustainable culture at UFCA, the understanding and commitment of all the actors that make up the institution are necessary. It is necessary to develop strategies to encourage the adoption of good practices by students, teachers and collaborators, in addition to encouraging research in the area, considering the great scientific potential, construction and dissemination of knowledge that a university has. For this institutional change to occur, it is necessary to educate for sustainability, reviewing the curricular components of the courses and including training focused on sustainable management in the staff development plan.

For future studies, it is suggested that this study be applied to other educational institutions and different public bodies, including those that already have more strongly institutionalized sustainable management, to obtain a comparative analysis and verify possible variables that influence the results. Furthermore, this research can be expanded by using other measurement tools with the intention of observing aspects that may not be present in the UI GreenMetric indicators.

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