Socio-environmental accounting system in health management: a case study at the Vision Institute

Sistema contábil socioambiental para gestão em saúde: um estudo de caso no Instituto da Visão

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ABSTRACT

In recent years, the society has increased the pressure on institutions to improve their social and environmental efforts, in addition to economic considerations in decision-making and internal behavior. This study analyzes the applicability of socio-environmental management tools in the health care sector through the partial application of the Environmental Management Accounting System called SICOGEA – Generation 3. This is an investigative and descriptive case study conducted at the Vision Institute (São Paulo Institute of Studies and Research in Ophthalmology, Brazil), where information was collected through semi-structured interviews. The results demonstrated that the studied institution has a level of general sustainability of 22.4%, which is considered "Weak." This means that although it conducts certain initiatives for environmental management, the institution may be causing damage to the environment.

Keywords: Environmental management. Socio-environmental Accounting System. Sustainability.

RESUMO

A sociedade vem aumentando nos últimos anos a pressão sobre as instituições que não observam os aspectos sociais e ambientais, além do econômico, na tomada de decisão e conduta interna. Este estudo tem como objetivo analisar a aplicabilidade de uma ferramenta gerencial socioambiental na Gestão em Saúde, por meio da aplicação parcial do Sistema Contábil Gerencial Ambiental (SICOGEA) – Geração 3. A natureza da pesquisa é exploratória e descritiva e se caracteriza como um estudo de caso no Instituto da Visão (Instituto Paulista de Estudos e Pesquisas em Oftalmologia, Brasil) utilizando-se de entrevistas semiestruturadas. O resultado obtido demonstrou que a instituição estudada possui um grau geral de sustentabilidade de 22,4%, que é considerado "Fraco", segundo

a metodologia utilizada, o que significa que, embora existam algumas iniciativas na área da gestão ambiental, a instituição pode causar danos ao meio ambiente.

Palavras-Chave: Gestão ambiental. Sistema contábil socioambiental. Sustentabilidade.

1 INTRODUCTION

Organizational business decisions are typically based solely on economic considerations, which has triggered or aggravated socio-environmental problems in many countries over the years. In the search for solutions to such problems, the idea of sustainable development emerged, which is based simultaneously on three dimensions: economic, social, and environmental. Therefore, it is a strategy to meet the needs of current generations without compromising the needs of future generations (BRUNDTLAND, 1988).

The use of socio-environmental management tools has become widely used by institutions that seek to control the impact of their activities on the environment. Comprehensive environmental management requires collaboration between several departments within an institution since the interaction between administration and production influences the effectiveness of the process (SANTOS et al., 2001).

In this context, this study applies the first step of the third phase of the Environmental Management Accounting System called SICOGEA, which examines environmental, social, and economic indicators. This is a qualitative-quantitative model that helps to diagnose institutional activities in a socio-environmental scope, identify critical points regarding sustainability, and structure a management plan to address areas in need of improvement (PFITSCHER, 2004).

This was the first time SICOGEA was applied in the health sector in São Paulo, SP, Brazil. The health sector represents one of the most complex and far-reaching sectors, particularly in terms of the interrelated impacts that the environment has on the health of the population. According to the World Health Organization (WHO) data from 2011, global health expenditures amounted to approximately 9% of gross world product (WHO, 2014).

Healthcare managers are facing the challenge of modernizing their management models to include principles of excellence and quality in different areas. Building an integrated and managerial health system is necessary to meet the expectations and health needs of the population (Lorenzetti *et al.*, 2014).

2 OBJECTIVES

This study aimed to evaluate whether the application of a socio-environmental accounting system for a healthcare facility is feasible and to analyze the results of this application. The assessment was performed as a case study at the São Paulo Institute of Studies and Research in Ophthalmology (IPEPO), also known as the Vision Institute, in São Paulo, SP, Brazil.

We implemented a partial application (first step of the third phase) of the SICOGEA methodology in IPEPO to analyze the contribution of the tool to the institution and the flexibility of the system.

This paper highlights the pioneering application of SICOGEA in the State of São Paulo, as well as the low cost of implementing the methodology and the improvements offered by the socio-environmental management tool in a particular environment.

3 LITERATURE REVIEW

Since the 1950s, a significant change has been observed around the world in the way people view the economy and its association with society (DE CASTRO *et al.*, 2011). This change intensified after World War II, mainly because of the fear of pollution from nuclear radiation. In 1962, the environmental movement gained notoriety with the publication of Rachel Carson's book, "Silent Spring," which criticized the health effects of synthetic pesticides in agriculture and highlighted the need for the preservation of the environment to protect human health (JACOBI, 2005; NASCIMENTO, 2008). It was noticed that the physical, social, and economic environments were intrinsically linked, and the deterioration of the environment could lead to negative outcomes in people's health.

Consequently, the United Nations Conference on the Human Environment was convened in Stockholm, Sweden in 1972. This conference implemented the Declaration on the Human Environment, also known as the Stockholm Declaration, and established the principles for international environmental issues, including human rights, natural resources management, pollution prevention, and the relationship between the environment and development (NOHARA et al., 2006).

Due to the increasing pressure from the interested parties, the adoption of environmental management systems (EMSs) as a tool for integrating policies, programs, and corporate practices for environmental protection became more widespread among national and multinational companies around the world (MORROW; RONDINELLI, 2002; SIMON et al., 2012). Many EMSs were created and, specifically in Brazil, the systems involved environmental accounting, social balance, value-added statements, global reporting initiatives, integrated reporting, and management of environmental aspects and impacts. The Environmental Management Accounting System SICOGEA was recently added to the suite of environmental management tools used in Brazil, and its prominence has developed rapidly.

3.1 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

An EMS is a management tool that enables an entity to monitor and control the impact of its activities on the environment through a set of processes (TINOCO; KRAEMER, 2008). Researches indicate that EMS implementation has some advantages, such as conserving raw materials and inputs, satisfying customers' environmental expectations, satisfying criteria for bank loans, limiting risk, reducing insurance costs, and maintaining good relations with the community (BARATA *et al.*, 2007; SANTOS, 2013). Moreover, customer loyalty is highlighted as a financial benefit (Feng *et al.*, 2016).

However, it is worth remembering that improper implementation, misaligned with the company's strategy or without a thorough understanding of the purpose, can lead to non-recovery of investment (LUCAS & NOORDEWIER, 2016).

Internationally, the most commonly used EMSs are the International Organization for Standardization (ISO) 14000 (International Organization for Standardization 2015) and the Eco-Management and Audit Scheme (EMAS). In Brazil, two other prominent EMSs are Management of Environmental Aspects and Impacts (GAIA) and SICOGEA.

3.2 MANAGEMENT OF ENVIRONMENTAL ASPECTS AND IMPACTS - GAIA

The GAIA method, created by researcher Alexandre Lerípio, manages the environmental performance of organizations based on ISO 14000. According to Nardelli and Griffith (2003), ISO 14000 is a series of standards updated by the ISO, to standardize the voluntary implementation of EMSs in various sectors and help companies to manage their products, services, and processes in a way that does not negatively affect the environment and the community. The GAIA method focuses on achieving

environmental sustainability through the study of organizational processes and their relationship with the environment (LERÍPIO, 2001). In addition to adhering to initial ISO guidelines, it also proposes continuous improvement and prevention.

3.3 ENVIRONMENTAL MANAGEMENT ACCOUNTING SYSTEM – SICOGEA

SICOGEA was based on the GAIA method and consists of an environmental management tool developed in Brazil that links accounting of environmental impact with controls (PFITSCHER, 2004). According to Uhlmann (2011), this method represents a management model combined with the Accounting and Environmental Management tool, which is applicable to the organizations in different sectors. The model allows the evaluation of environmental events and transactions as well as assists in the identification of critical points regarding sustainability.

Fifty-five publications were identified (articles, final course papers, theses, dissertations) that examined SICOGEA, published during the period from 2003 to 2018. These publications cover a wide variety of sectors, such as trade companies, infrastructure (energy distribution, sanitization), hospitals/health, industry, government agencies, general services, education, and technology (Figure 1).

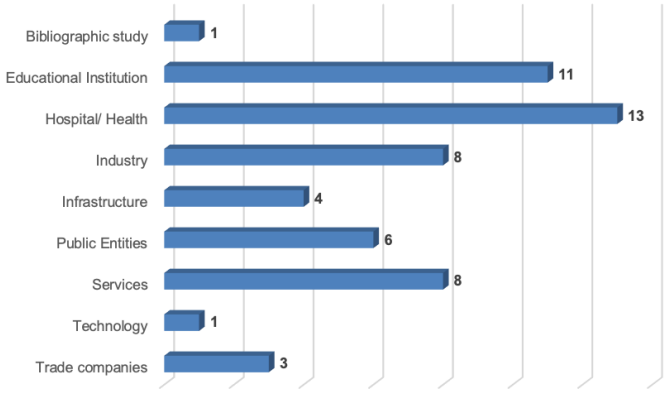

Figure 1 | Publications on SICOGEA from 2003 to 2018 by sector.

Source: Elaborated by the author.

This literature review shows the prominence of the health sector in these studies. Twelve studies were done in the healthcare industry, representing a plurality at 26% of the total studies identified in the study period. According to Pfitscher (2004), SICOGEA has three distinct phases (Figure 2):

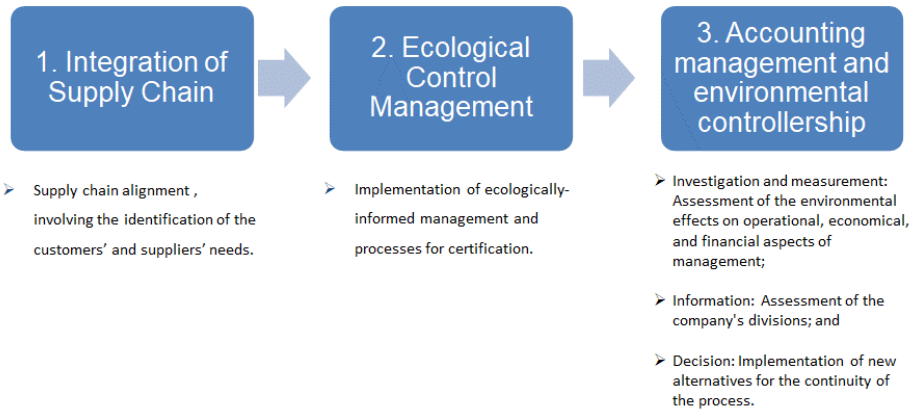

Figure 2 -| SICOGEA phases.

Source: Elaborated by the author, adapted from Pfitscher (2004) and Nunes (2010).

This study will focus on the first step of the third phase, called "Investigation and measurement". This step's goal is to evaluate the environmental performance of the institution using a checklist structured based on groups and subgroups. The next step is to raise awareness and secure commitments from those involved in the sectors that require environmental improvement. In the "Information" step, a detailed mapping of the value chain is performed, developing an inventory of environmental aspects and impacts. In the "Decision" step, suggestions provided by the model are implemented as well as actions that could reveal further opportunities for improvement are proposed while considering the technical feasibility and accounting of these actions (NUNES, 2010). Since SICOGEA's creation, it has been updated twice, with Generation 3 released in 2011 that further maximizes the model's structure.

4 METHODS

The methodology adopted in this study was investigative and predominantly qualitative (GIL, 2002). The case study was conducted at the Vision Institute, for evaluating the partial application of the Environmental Management Accounting System called SICOGEA - Generation 3.

The approach being qualitative and quantitative, the inherent characteristics are: (i) restriction in the application of the methodology, as it was a case study in a specific institution, and consequently, its results cannot be generalized broadly to other institutions (however, this fact do not reduce its importance to compile the knowledge base for future studies) and (ii) the analysis relied on the competence of the responses obtained in the interviews.

This study implemented the "Investigation and measurement" step of the third phase of SICOGEA – Generation 3, which consists of the following items: a) sustainability and environmental strategy that defines key groups and subgroups for the checklist and semi-structured interviews, calculates levels of sustainability, defines environmental performance, and establishes a concise action plan; b) commitments that allow for verification that they align with the mission, vision, policies, and goals of the strategy; c) a sensitivity check of the interested parties that engage with and monitors participants and their perception of their responsibilities in the context of their institution's social and environmental responsibilities.

For each item on the checklist that was used to frame the interviews, the researcher assigned a value on a scale of zero to five points or N/A (not applicable) and weighting to each item. It is possible to calculate the points achieved in each question, multiplying the possible points by the weighting, as the scale proposed from information supplied by the respondent to the researcher.

By dividing the sum of the points achieved by the total possible points, we could determine the level of sustainability of the institution (Figure 3):

$$\text{General level of sustainability: } \frac{\textit{Points achieved}}{\textit{Possible points}}$$

Figure 3 | Formula for the general level of sustainability.

Source: Nunes (2010).

To avoid distortions in the level of general sustainability of the institution, as a result of key groups and subgroups of different sizes, it was necessary to weight the contributions of each one, using the following formulas (Figure 4):

$$\%\ Contribution\ of\ the\ subgroup = \left\{\left(\frac{Total\ of\ possible\ points\ of\ the\ subgroup}{Total\ of\ achieved\ points}\right) \times \left(\frac{100}{Total\ amount\ of\ subgroups\ in\ the\ questionnaire}\right)\right\} \times 100$$

$$\%\ Contribution\ of\ the\ key-group = \left\{\left(\frac{Total\ of\ possible\ points\ of\ the\ key-group}{Total\ of\ points\ achieved}\right) \times \left(\frac{100}{Total\ amount\ of\ key-groups\ in\ the\ questionnaire}\right)\right\} \times 100$$

Figure 4 | Formulas for the weighted percentage contribution of the subgroups to the key group.

Source: Nunes (2010)

After an initial interview with the General Superintendent of the institution, the checklist was finalized, consisting of 134 questions associated with key groups and subgroups and a corresponding weight assigned to each question.

The interviews were conducted from April 13 to May 5, 2016, with five employees responsible for the following areas: human resources, contracts, accounting, ambulatory, and surgical centers.

There was no review of supporting documentation related to the interview content as part of this case study since the partial application proposed in this study did not cover this type of investigation.

5 RESULTS

IPEPO, or the Vision Institute, is a non-governmental and non-profit organization (association) founded in 1990 and staffed by professors from the Medical School of the Federal University of São Paulo, Brazil. IPEPO provides medical services through diagnostics, clinical treatments, and surgeries in assistance or teaching projects, with a mission to contribute to advances in ophthalmology and make them accessible to all.

The vision and mission of IPEPO are fully compatible with the goal of sustainability as well as the desire to be a national leader in eye health. The IPEPO clinical and administrative staff in 2015 totaled 72 employees.

The resources managed by IPEPO originated from concerned health providers, protocols, grants, and contracts/agreements primarily with the Brazilian Unified Health System (SUS). According to the data from 2015, IPEPO held 242,936 visits/procedures, of which 91% (221,807) were patients of the SUS, and the remaining 9% (21,129) were private patients, patients of health operators, and patients of the Municipal Public Server Hospital (IPEPO, 2016).

From 2011 to 2015, 644,577 visits were conducted, of which 92% (590,118) were referred by the SUS and 8% (54,459) referred by other calls. In the same period, IPEPO presented an annual growth rate of approximately 9.75% per year, as shown in the following figure (Figure 5):

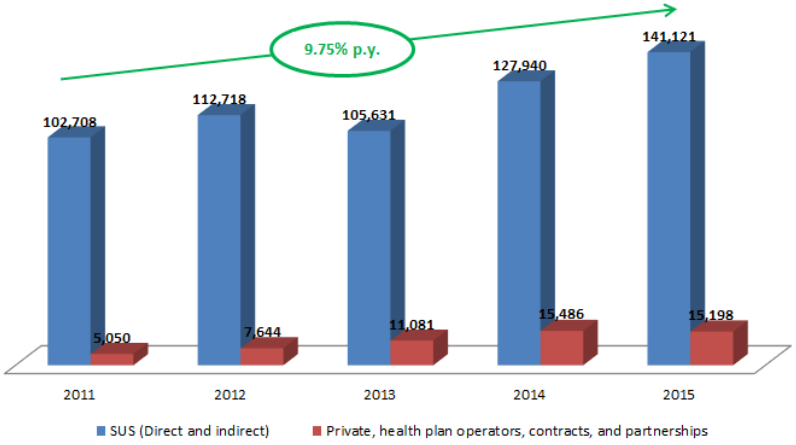

Figure 5 | Visits conducted at IPEPO from 2011 to 2015.

Source: Elaborated by the author.

IPEPO was chosen for this research because of the accessibility to data necessary for the completion of this study, which aligns with its origin as an institution of professors from the Medical School of the Federal University of São Paulo, Brazil. Presently, the institution does not have a socio-environmental tool for management support, although it is interested in growing sustainably.

5.1 RESULTS OF SICOGEA APPLICATION

Considering the weighted score of each question, the level of general sustainability (percentage of achievement) was obtained for each key group and subgroup, as follows (Table 1):

Table 1 | Level of general sustainability.

Level of general sustainability				
Key group	*Subgroup*	*Points achieved*	*Possible points*	*Percentage of achievement*
SERVICES RENDERING	Suppliers	0.2	19	1.1%
	Treatment of patients	8.4	19	44%
	Waste Treatment	4.0	21	19%
	Maintenance	1.6	10	16%
HUMAN RESOURCES	Team	9.2	26	35%
	Management	7.0	27	26%
INTERNAL MARKETING	Socio-environmental responsibility	3.2	11	29%
FINANCE	Environmental accounting and auditing	4.0	35	11%
TOTAL		**37.6**	**168**	**22.4%**

Source: Primary data.

The level of general sustainability was then compared with the assessment of sustainability and environmental performance (Table 2), following the "Sustainability and Environmental Strategy" step (discussed in the Methods section).

Table 2 | Assessment of sustainability and environmental performance.

Result	*Sustainability*	*Development*
Less than 20%	Terrible	It may have significant negative impacts on the environment.
Between 21% and 40%	Weak	It may cause damage but occurs infrequently.
Between 41% and 60%	Regular	It meets the governmental standard.
Between 61% and 80%	Good	Beyond the standard, there are some aspects and attitudes that enhance the environment.
Higher than 80%	Great	High environmental value with ecological production and pollution prevention.

Source: Adapted from Nunes (2010) and Pfitscher (2004).

The general performance of the institution, according to the checklist and the weighted score, was 22.4%. This result points to a general performance considered "Weak," which means that, although they have some environmental initiatives, the institution may have an overall negative impact on the environment. Considering the field of work and activities of the IPEPO, the possible impacts on the environment can occur indirectly, for example, through improper disposal, garbage-polluting suppliers, low efficiency or recycling when replacing electronic equipment, lack of reuse when possible, and resistance to reform, among others.

SERVICES RENDERING

This key group is made up of a few subgroups: suppliers, treatment of patients, waste treatment, and maintenance. The percentage of achievement for this key group is 21%, considered "Weak."

The first subgroup, "Suppliers", presented a level of general sustainability of 1.1%. This result is mainly because purchases and/or hiring of suppliers are conducted with sole priority of meeting the standards of the Coordination of Health Surveillance of the Municipal Health Department of São Paulo (COVISA), with no other initiative, policy, or internal incentive to drive consideration of environmental aspects when procuring from suppliers.

The subgroup "Treatment of patients," which entails the processes by which patient visits are conducted, presented a general sustainability level of 44%, a result considered "Regular", indicating that the institution meets the appropriate standard and introduces and maintains actions that seek social and environmental recovery. According to the respondents, the institution follows the standards of COVISA regarding the health and safety of persons.

The subgroup "Waste treatment" refers to the institution's treatment of waste generated from health services. The level of general sustainability obtained was 19%, considered "Terrible" because there is a high chance that the institution is impacting the environment. This result is partly due to the lack of treatment of liquids when washing containers containing infectious waste.

The subgroup "Maintenance" assessed the actions of the institution regarding the conduction of reforms, repairs, construction, furniture, and utensils disposal, among others. The result was 16%, considered "Terrible," which is mostly due to the lack of prioritization and focus on the impact on the environment in the planning and execution of works and maintenance necessary for its activities. Additionally, the institution has no defined processes that guide recycling or storage of harmful materials and does not recall inappropriate materials identified in building maintenance.

HUMAN RESOURCES

The key group of Human Resources is made up of the subgroups Team and Management, and presented a general sustainability level of 31%, considered "Weak." In the subgroup "Team", the level of sustainability achieved was 35%, considered "Weak." According to the respondent, the institution offers basic benefits to its employees, such as health insurance, meal allowance, and childcare allowance. It also has a career and salary plan structure. However, there is no effective prioritization of the development of its human capital and no established methods or processes to encourage creative or innovative thinking, to encourage the voluntary participation of employees in social projects, to empower internal staff to preserve natural resources, or to track indicators of staff management by department.

In the subgroup "Management", the level of general sustainability obtained was 26%, which also considered "Weak." Although the management of the institution is very active in social projects and continuously seeks to provide an adequate number of people to care for patients, other aspects related to internal communication of strategies, guidelines, and institutional values still have great opportunities for improvement.

INTERNAL MARKETING – SOCIO-ENVIRONMENTAL RESPONSIBILITY

This key group specifically addresses actions within the scope of socio-environmental responsibility and internal marketing actions. The result of 29% is considered "Weak," which is primarily because of the absence of any initiatives related to internal conduct and communication regarding socio-environmental responsibility.

The institution seeks to monitor indicators of patient satisfaction, provide communication channels, and use information collected to promote improvements. However, it could focus more on the inclusion of socio-environmental actions in its community projects, including the identification of needs and assessment of satisfaction of the communities in which it works, and even on the communication to its patients about its appreciation for and concern with the environment.

FINANCE: ENVIRONMENTAL ACCOUNTING AND AUDITING

This key group of Finance related to environmental accounting and auditing with a performance of 11%, which is considered "Terrible." This reflects the lack of prioritization of environmental aspects, as it does not have any procedures in place to capture environmental information, does not use financial tools to analyze these aspects, nor have any indicators of efficiency or management in this sense.

5.2 EFFICIENCY INDEX PER KEY GROUP AND SUBGROUP

Concerning the general level of sustainability of the institution at 22.4%, a distribution of the relative contribution of each key group to this result is shown below (Table 3):

Table 3 | Contribution per key group

Contribution per key Group	
Services Rendering	37.8%
Human Resources	43.1%
Internal Marketing	8.5%
Finance	10.6%
TOTAL	**100%**

Source: Primary data.

Based on data from Table 3, the key group "Human Resources" had the highest contribution to the points achieved, accounting for a total of 43.1% of the total points, followed by "Services Rendering" with 37.8%. The key group with the smallest contribution was "Internal Marketing", with 8.5%, followed by "Finance" with 10.6% of the total number of points achieved. The relative contribution of each subgroup to the total result was also analyzed, and is presented in Table 4:

Table 4 | Contribution by subgroup

Contribution by subgroup	
Suppliers	0.5%
Treatment of patients	22.3%
Waste treatment	10.6%
Maintenance	4.4%
Team	24.5%
Management	18.6%
Socio-environmental responsibility	8.5%
Environmental accounting and auditing	10.6%
TOTAL	**100%**

Source: Primary data.

Data presented in Table 4 shows that the subgroup with the greatest contribution was the subgroup "Team" with 24.5%, followed by the subgroup "Treatment of patients" with 22.3%, which is consistent with the replies obtained from employees in the interviews, demonstrating the targeting of resources to patient care and the employees.

The smallest contributions came from the subgroups "Suppliers" with 0.5%, "Maintenance" with 4.3%, and "Socio-environmental responsibility" with 8.5%.

5.3 ANALYSIS OF FINANCIAL STATEMENTS

Based on financial statements of IPEPO that are available to the public, we performed a financial accounting analysis for the period from 2012 to 2016[1], from which we noted the following.

The total assets of IPEPO, which represents the set of goods and rights of the entity, was R$19,207, which represents an increase of 46% over the previous year (R$13,194) and 102% compared to 2012 (R$9,501). Of the total assets in 2016, it is possible to verify that 46% (R$8,844) lies in cash and cash equivalents, its most liquid group of assets.

Regarding liabilities, it is observed that obligations and short-term debts showed successive increases of over 50% in the last two years, from R$3,326 (in 2014) to R$5,135 (2015) and reaching R$8,040 in 2016. However, the percentage distribution of obligations during the examined period did not significantly change, except in the reduction of equity from 60% of the total liabilities in 2012 to 49% in 2013, which demonstrated a reduction in dependence on their resources.

As part of the analysis, the researcher produced a pro-forma statement based on the following adjustments: exclusion of social incomes, since they represent donations and conference resources; incomes and expenses from the same source were reported in one figure as net income; and incomes/expenses were only considered if they related to the SUS, financial projects, taxes, depreciation, and other expenses. The remainder was considered to be the provision of services in general. Following this method, the obtained pro-forma results are listed in Table 5.

Table 5 | Pro-forma statement

Amounts in Brazilian reais	*2012*	*2013*	*2014*	*2015*	*2016*
SUS INCOME/EXPENSES	1,939,174	694,782	-16,093	-667,722	475,291
FINANCIAL PROJECT INCOME/EXPENSES	252,276	314,437	322,154	518,546	293,739
RESULTS FROM PROJECTS	0,370	185,455	258,867	219,769	345,266
RESULTS WITH SERVICES RENDERING	-745,383	-689,506	-898,859	-115,228	-1,117,799
TAXES AND OTHERS	-158,561	-117,205	-199,794	-236,027	-347,459
PRO-FORMA OPERATIONAL RESULT	1,287,876	387,963	-533,725	-280,662	-350,962
SOCIAL INCOME	108,107	0,977	416,369	537,331	2.671,638
PRO-FORMA TOTAL RESULT	1,395,983	388,940	-117,356	256,669	2,320,676

Source: Created by the author.

In this pro-forma statement, significant deterioration was observed: IPEPO went from seeing a profit of R$1,288 in 2012 to a loss of -R$351,000 in 2016. The contribution of the SUS incomes/expenses, which in 2012 was R$1,939, reduced to R$475,000 in 2016 and was negative at -R$668,000 in 2015.

The financial analysis of the institution's data assists in understanding the maturity level and decisions made by the administration as well as indicates areas for improvement in the business decisions and use of resources.

6 DISCUSSION

Environmental management systems can assist managers in addressing complex issues, as they can break down the issue into multiple variables and reduce the fragmentation of knowledge and resources available, through engagement with stakeholders to develop an integrated multidisciplinary approach or continuous monitoring of the results from changes to variables (VIRAPONGSE *et al.*, 2016).

SICOGEA, developed in 2004, gained attention in Brazil as a free, easy-to-use tool that was developed locally. It was initially applied and tested in an ecological rice production chain and, over the ensuing years, other studies demonstrated its applicability to companies and entities from other sectors, such as hospitals, residences, hotels, supermarkets, and textiles, demonstrating the versatility of SICOGEA (NUNES, 2009; BERNADETTE *et al.*, 2013).

To make comparisons between entities, SICOGEA provides a set of tools, which were used in research that evaluated sustainable practices in science and technology institutes, in particular the Massachusetts Institute of Technology, Swiss Federal Institute of Technology Zurich, and three Brazilian institutions. The research developed and applied a framework that considered social, economic, and environmental aspects. The Global Reporting Initiative (GRI), International Sustainable Campus Network (ISCN), Public Administration Environmental Agenda (A3P), and SICOGEA were all considered in the framework (GUSTAVO DE LIMA et al., 2016).

Although IPEPO was not the first non-profit institution to be studied using SICOGEA, it was the first in São Paulo City (São Paulo State, Brazil). By calculating its general sustainability level of 22.4%, this can now be compared with other institutions, including other health care organizations, located within the State of Santa Catarina (Brazil).

Table 6 presents IPEPO's main results in comparison to other entities, all located in Florianópolis City (Santa Catarina State, Brazil). Entity #1 is a medium-sized hospital with an average monthly attendance of 1,200 patients (PAMPLONA et al., 2010); Entity #2 is a public hospital, an integral part of the health service of the Brazilian Army, founded in 1869 (Danúbia *et al.*, 2012); and Entity #3 is a private institution in the area of cardiology composed of approximately 233 collaborators (FONTES, 2012).

Table 6 | Comparison of some results of IPEPO with other institutions

Group/subgroup	*Entity #1*	*Entity #2*	*Entity #3*	*IPEPO*
SUPPLIERS	66.67%	41.05%	84.29%	0.5%
TREATMENT OF PATIENTS	75%	57.69%	59%	22.3%
HUMAN RESOURCES	70%	74.81	84.85	43.1%
ENVIRONMENTAL ACCOUNTING AND CONTROLLERSHIP	17.65%	60%	47.23%	10.6%
LEVEL OF GENERAL SUSTAINABILITY	56.58% (REGULAR)	61.01% (GOOD)	66.79% (GOOD)	22.4% (WEAK)

Source: Created by the author.

These institutions were chosen based on data obtained from other applications of SICOGEA in the healthcare sector, which were the available applications that were the most comparable with IPEPO, but still differ in their level of environmental maturity as well as operation.

In the "Suppliers" subgroup, the private institution of cardiology showed in Table 6 presented results above 84%. In this subgroup IPEPO presented the lowest environmental performance was "Suppliers" (0.5%), mainly due to the absence of an internal policy that defines and regulates socio-environmental considerations concerning them, such as requiring, for example, environmental certification or involvement in social programs on the part of the supplier or a definition of socio-environmental goals or skills.

In the "Human Resources" subgroup, the entities from Florianópolis showed in Table 6 presented results above 70%. IPEPO reached 43.1%, which accounts for the most positive highlight of IPEPO's promotion of social projects such as the Amazon Project called "Catarata do Baixo Amazonas." However, the low participation and involvement of employees in strategic planning, as well as the absence of a leadership assessment to review established skills or indicators of managerial efficiency and adherence with the overall strategy, reduced the results of IPEPO in this subgroup.

In the subgroup "Treatment of patients", IPEPO obtained 22.3%, representing its second-highest result among the subgroups examined for this comparison, which was roughly consistent with the results of other entities presented in Table 6. For entities #2 and #3, this was their greatest individual result obtained among the subgroups, with 75% and 59%, respectively. This demonstrates the prioritization of patient treatment by these institutions. IPEPO meets the current standards and regulations regarding patient treatment; however, there is still an opportunity for improvement in terms of its recycling processes, ongoing campaigns of rational use of resources, and encouragement of internal initiatives that offer solutions to minimize negative effects on the environment.

Environmental accounting and controllership had the worst result for entities #1 (47.23%) and #3 (17.65%), which was not different from IPEPO that had a "Terrible" status (10.6%) in this group. This was due to the fact that the institution possesses only goals and indicators of financial and accounting efficiency and has yet to implement any other tools or socio-environmental indicators, such as the voluntary disclosure of the Social Balance or Added Value Statement.

Most applications of SICOGEA implement the first step of the third phase, because of the cost-benefit relationship. This step can demonstrate the importance of "Investigation and measurement" for

administrators of institutions to become more informed about their current status and to identify areas of improvement. This also demonstrates the challenge of completing the full application of the method because of its complexity and the investment of time and resources required for each step and phase.

Some of the main advantages of this method are its relatively low cost of implementation and its framework that facilitates management over time by analyzing the results of the questionnaire, supporting decision making and planning given a proposed financial accounting analysis and sustainability assessments of key groups, and engaging stakeholders around the diagnosis and concise plan of management.

Regarding the disadvantages, the quality of the results depends on the quality of the interviews and the flexibility to adapt the questionnaire limits the comparability of the results between different institutions. Additionally, there is an absence of information on entities that have expanded their use of SICOGEA to other phases and steps, thus limiting the analysis of the method as a whole.

Possible correlations between socio-environmental investment and business performance are a recurring theme in the literature. In a study by Cristófalo *et al.* (2016), an assessment was made of the performance of companies that comprise the Index of Corporate Sustainability (ICS) of the B3 (Brazil´s Stock Market) in contrast with companies from the same sectors that are not in the index, to observe whether or not sustainability practices contribute to the valuation of companies, using data from 2006 to 2014.

However, it was not possible to determine a correlation between all of the ICS companies and their value (this correlation was observed only in two economic sectors), highlighting some of the challenges faced in quantifying or analyzing financial returns concerning socio-environmental investments. In China, for example, a study showed a positive correlation between environmental measures and the companies' values in the country's stock exchange; however, the significant financial impact did not occur in the same period in which environmental actions are carried out, they were realized the following year (SONG *et al.*, 2017).

Lannelongue et al. (2017) demonstrated a specific benefit for entities that do not require high investment: the adoption of environmental management measures positively influencing the productivity of employees. The measures strengthened the social role that the entity carried out, which was recognized by its staff, partners, and society. Johnstone (2019) mentioned, as part of a systematic analysis of environmental management systems in small to medium-sized enterprises, the benefits of long-term performance improvements could be immediately realized through employee engagement in environmental initiatives.

7 CONCLUSIONS

The general sustainability level for IPEPO based on the SICOGEA checklist method was 22.4%, which indicates a weak level of sustainability and that the institution may be causing damage to the environment and society, despite running some positive initiatives.

There were some limitations to this research due to the data collection method of filling out a questionnaire during semi-structured interviews. Additionally, due to the restricted and limited access to the main IPEPO authorities, the awareness of the interested parties and follow-up of participants were only partially fulfilled.

Considering the mission and vision of IPEPO, in light of the results obtained by the application of SICOGEA, it would be relevant to the administration of the institution to adopt a management tool that allows the monitoring and evaluation of its social, environmental, and financial sustainability. The SICOGEA method is applicable to the health care sector, assisting managers and teams to understand the current situation of the institution and to target future actions.

Further research should target the expansion of applying SICOGEA in the health care sector and, if possible, focus on an additional sector to broaden the base of knowledge to help institutions to determine how adopting these management tools can guide their management of resources and performance, in addition to improving the research tools developed in Brazilian universities.

NOTES

1 | Data from 2011 were not considered due to a restructuring process that occurred in this period, significantly affecting the performance.

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