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**05**

# ENVIRONMENTAL CERTIFICATION IN CEARÁ (BRAZIL) FOR PROTECTION OF ENVIRONMENTAL RESOURCES AND PROMOTION OF SUSTAINABILITY

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**Abstract:** *The environmental certification of the State of Ceará, established by the Seal Municipality Green Programme (PSMV), verifies the commitment of urban environmental management facing challenges of sustainability in the territory of the local governments, from a set of environmental indicators. The PSMV's indicators can easily be monitored, because they are both qualitative and quantitative, and they should indicate if municipalities are achieving the goals of local sustainability. The objective of this paper was to analyze the indicators used in this certification under Brazilian and Ceará legislation, considering the protection of natural resources and the promotion of sustainability. For this purpose, it was carried out a documentary research. The PSMV's indicators were classified in four dimensions of sustainability. The results indicate that the requirements of the PSMV are getting along with the national and state policies, correlated to the environmental area. The PSMV respects the dimensions of sustainability and identifies environmental restrictions, which decision makers can use to improve their environmental performance and to achieve sustainability in the territory of the municipality. The environmental certification program, therefore, represents an important strategy for achieving sustainable cities.*

**Key words:** Environmental Management; Certification; Sustainability Performance.

## Introduction

Over the past years, public organizations have become more concerned and aware of their importance in reducing environmental impacts and influencing citizens in direction of sustainable attitudes (Alpenberg et al., 2018, Navarro-Galera et al., 2014, Rodriguez Bolivar et al., 2016). The growing demand for sustainable actions has reached different actors and local governments (Mercer and Jotkowitz, 2000; Campos et al, 2015). In this context, local governments are reorganizing and creating strategies for environmental management (Bellinger et al., 2011). However, changes in this direction are slow. An innovative experience to encourage a greater insertion of local power in matters related to sustainability is the environmental certification programme of the State of Ceará - Brazil, called the Seal Municipality Green Program (PSMV). One of the challenges of the PSMV is placing the environmental variable in the decision-making process at local level. The Program has been evaluating local governments since 2003. The municipalities have constitutional duty to establish the use of environmental resources according the maintenance of environmental quality, required over time, associated with the productive capacity of different socioeconomic activities.

Incorporating the environmental dimension into the decision-making process is not an easy task. It requires commitment of civil society and public authorities. The environmental certification, called the Seal Municipality Green Program (PSMV), has contributed to the implementation of environmental policy throughout the state of Ceará. The result of the PSMV identifies the Environmental Sustainability Index (ISA). ISA represents, therefore, the municipality's commitment to environmental sustainability in its territory, constituting itself as a tool to support society and the municipal public power to protect environmental resources and to approach the complex challenges of environmental issues. The objective of this paper was to analyses the indicators used in this certification under Brazilian and Ceará

legislation. The approach also studied the environmental indicators according to the protection of natural resources and the promotion of sustainability.

**The Seal Municipality Green Programme**

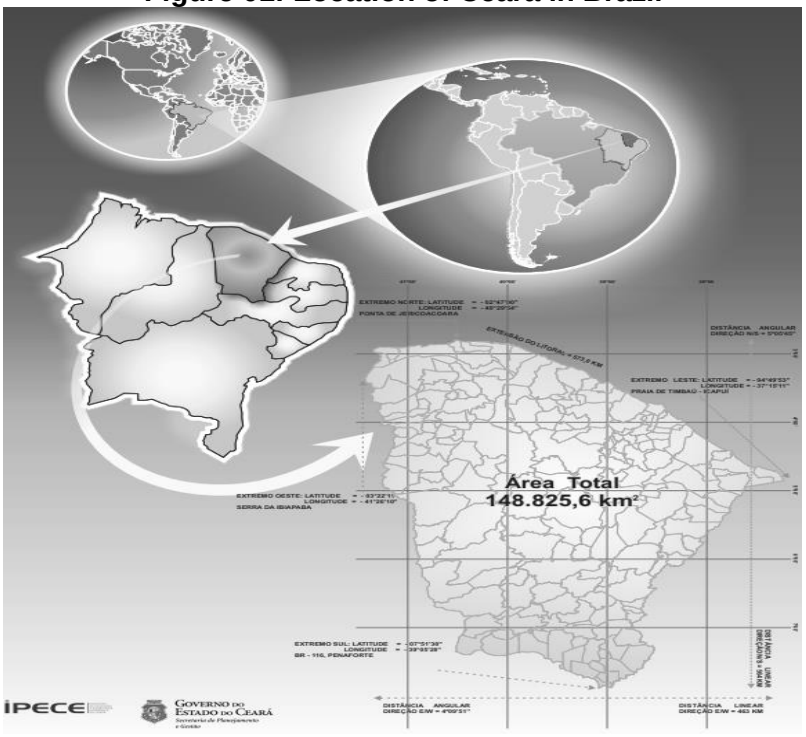
The Seal Municipality Green Program was established by State Law N$^{o}$ 13,304/2003, regulated by State Decrees N$^{o}$ 27,073 of June 2, 2003 and N$^{o}$ 27,074 of June 2, 2003 and modified by State Law N$^{o}$ 16,128/2016. The PSMV is the tag that identifies the municipalities of Ceará that develop environmental protective actions with the best possible effects in the environmental safeguard, according to State Law Nº 13.304/2003. For the development of the methodology and the implementation of the PSMV, the Management Committee and the Technical Commission were created, composed by 20 different institutions (public authority, civil society and Scientific & Technology institutions), coordinated by the State Secretariat of the Environment (SEMA), according to State Decree N$^{o}$ 27,074/2003. The PSMV is given every two years.

The Management Committee is responsible for admitting the environmental indicators of the Seal Municipality Green Program. These indicators follow the requirements of the Ministry of the Environment to ensure environmental quality. The criteria include: thematic, focus, geographical and temporal coverage and conjuncture (MMA, 2011). About the thematic, the indicator should measure some important aspects of environmental quality that reflect its integration with the concept of sustainable development (MMA, 2011). About the approach, the information generated by the indicator should be addressed to general public and decision makers (MMA, 2011). Regarding geographic and temporal coverage, the indicator should contemplate the changes in different geographical scales (national, state and local) and timing (MMA, 2011). Concerning the conjuncture, the indicators' choice should ensure a long-term perspective on data management (MMA, 2011). In addition, "Sustainability indicator systems should, however, enable the sustainability-based management of local affairs" (Hartmuth et al, p. 261, 2008).

**Study Area**

The State of Ceará is located in the Northeast of Brazil. Ceará has 184 municipalities and 93 percent of its territory is in the northeastern semi-arid region, which has characteristics of vulnerability to drought and precipitation irregularity (IPECE, 2019). Figure 1 shows the location of Ceará, in the Northeast of Brazil. The geographical extension of the study area is 148.825,6 km$^2$ (IPECE, 2019).

**Figure 01: Location of Ceará in Brazil**




Source: IPECE, 2019.

The land use is a significant factor of pressure on the environment in areas with singular characteristics such as Ceará. Thus, the protection of natural resources is an important strategy for stocks maintenance. In Brazil the competency to discipline land use is given to the municipalities, according to Article 30, of the Federal Constitution.

**Methodology**

Data collection was done from the secondary data, through documentary research. The documents for the examination were provided by the State Secretariat of the Environment (SEMA) and by national and regional legislation. The five thematic axes of the Seal Municipality Green Program were analyzed, namely: Municipal Environmental Policy; Environmental Sanitation and Public Health; Water resources; Sustainable Agriculture and Biodiversity. In each of the thematic axes, the specific environmental indicators were analyzed, totalizing 16 environmental indicators. For each indicator, we made notes concerning Malheiros and Philippi methodology (MALHEIROS and PHILIPPI, 2007), a qualitative approach. The notes contain information about relevance, threats, weakness, scale, data source, periodicity, institutional composition and its relation to public policies. The notes helped in indicators' classification.

Regarding the indicators' classification, we used the methodology elaborated by Rabelo (2007), considering the scopes: social, economic, environmental and institutional. The 16 environmental indicators in the methodology and its scores are:

1. Environment Structure (maximum score 15);
2. COMDEMAS Effectiveness (maximum score 4);
3. Implementation of the Environmental Education Policy (maximum score 12);
4. Implementation of Sustainable Technologies (maximum score 1);
5. Integrated Solid Waste management (maximum score 10);
6. Final Disposal of Urban Solid Waste (maximum score 4);
7. Social Inclusion of Collectors of Recyclable Materials (maximum score 6);
8. *Aedes aegypti* Infestation (maximum score 5);
9. Sanitary Sewage System and Water Supply System (maximum score 11);
10. Improvement of Water Quality (maximum score 7);
11. Sustainable Management of Agricultural Production (maximum score 3);
12. Training in Sustainable Agriculture (maximum score 2);
13. Municipal Conservation Unit (maximum score 5);
14. Urban Green Areas (maximum score 5);
15. Preservation and Conservation of Biodiversity (maximum score 5);
16. Deforestation and Burning Control (maximum score 5).

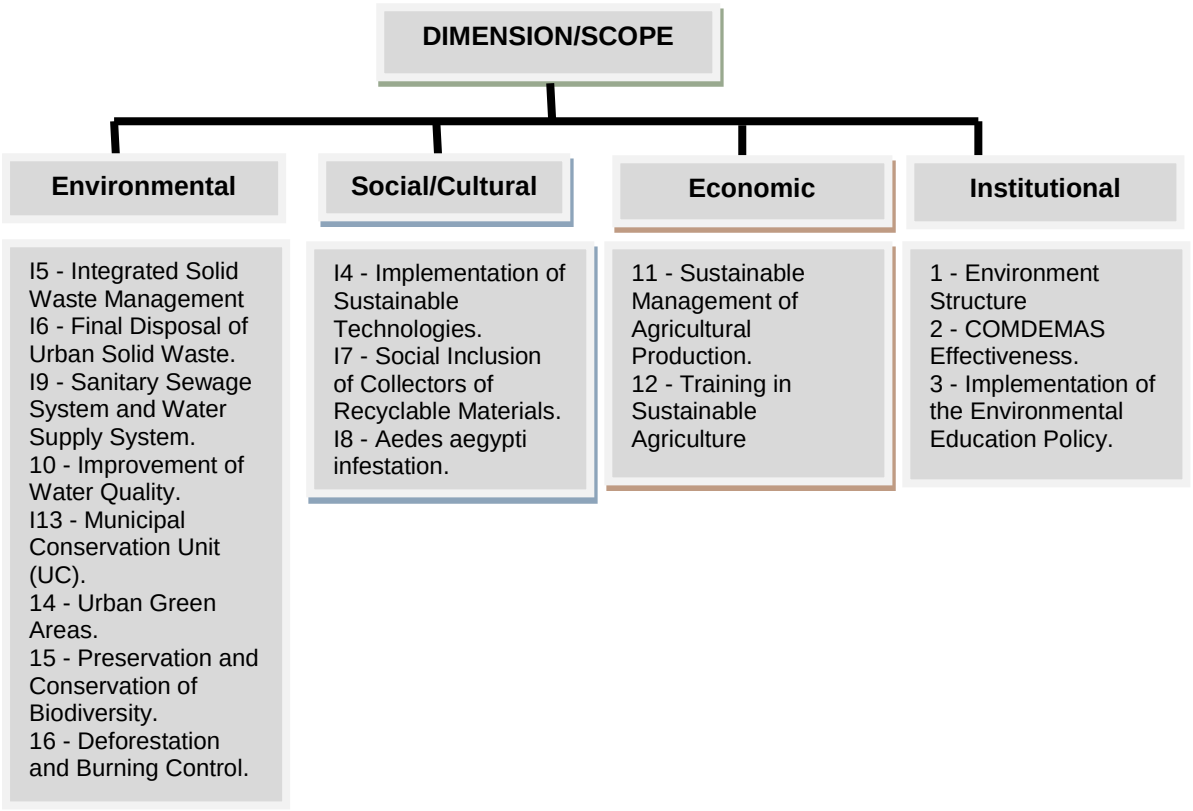
We showed the scores above, next to each indicator. The sum of the maximum scores is 100. The score for each indicator was defined by Delphi method (CHOI and SIRAKAYA, 2006). The sum (aggregation) of scores of each indicator in the municipality corresponds to Environmental Sustainability Index (ISA). The Organization for Economic Cooperation and Development (OECD) has developed the Pressure-State-Response methodology (LEVREL et al, 2009) based on the concept of causality, whereby human activities exert pressure on the environment by changing natural resources quality and quantity. Society responds to these changes through environmental, economic or sectorial policies (OECD, 1993). Therefore, the 16 indicators also follow the OECD methodology. Then, we studied Brazilian and Ceará environmental laws in view of the PSMV to support our discussion.

**Result and Discussion**

The 16 environmental indicators of the Seal Municipality Green Program - PSMV comply the Pressure-State-Response (PER) methodology. This methodology allows a group of indicators to relate the sources of pressure to each environmental issue, the situation of the environment linked to that issue and the procedures adopted by society to deal with or to solve the problem (MMA, 2011). Thus, the cause or source of the environmental problem is associated to the results of corrective actions to solve the problem. (MMA, 2011). Figure 2 shows the environmental indicators in relation to environmental, social / cultural, economic and institutional scopes, according to the dimensions of sustainability established by

economists (Spangerber and Bonniot, 1998, Rabelo, 2007), for the organizational context. Therefore, the economic, social and institutional dimensions of sustainability are on an equal footing with environmental concerns.

**Figure 02: Classification of PSMV indicators based on dimensions of sustainability**




The analysis identified the relevance of each indicator for PSMV and protection of natural resources, based on Brazilian and state legislation. Some analyzes are highlighted in this work. About the environmental dimension, the indicator "Green Urban Areas" is in the biodiversity aspect. It has relevance because it establishes open public spaces, according to the constitutional prerogative of regulating the land use by the municipality. The indicator is very important because it complies with Federal Law N$^{o}$ 6,766, dated December 19, 1979 and Federal Law N$^{o}$ 10,257, dated July 10, 2001, which regulated Articles 182 and 183 of the Federal Constitution. Urban green areas are an exigency for local governments, and the municipality is responsible for establishing the percentage of green areas by municipal law.

Another indicator of the environmental dimension, the indicator "Improvement of Water Quality" establishes the institutional arrangement, compulsory for the municipalities, regarding the provision of clean and safe drinking water to supply the population. Drinking water is a fundamental requirement for the maintenance of the dignity of human life, considering its availability and quality to human health and to reduce the consequences of diseases. The indicator complies with the criteria of the Basic Sanitation National Policy (Federal Law N$^{o}$ 11,445, of January 5, 2007). The indicator also complies with water quality standards, including the portability standards required by Administrative Ordinance M.S. N$^{o}$ 2,914, of December 12, 2011; and the Consolidation Ordinance M.S. N$^{o}$ 5, dated September 28, 2017. Some other laws are connected with this indicator, such as Water Supply and Sanitary Sewage State Policy of Ceará (Complementary State Law N$^{o}$ 162, of June 20, 2016); and the Health Promotion National Policy, of 2014.

Regarding the economic dimension, the indicator "Sustainable Management of Agricultural Production" refers to the institutional arrangement that promotes sustainable agricultural production. The land use is an example of activity that can influence the balance of the environment. Thus, it is essential that the land use is compatible with the ecosystems' capacity of résistance. Constitutionally, it is up to the municipality, according to Art. 30, the discipline of the land use and it is up to local governments to legislate about environmental

matters, concerning local specificities. Then, agricultural sustainable practices can achieve commitments voluntarily assumed by Brazil, like, for example, the reduction of greenhouse gases (GHG). Furthermore, "Sustainable Management of Agricultural Production" is directly related to the climate-friendly food production practices, and consequently the Sustainable Development Goal - SDG 2 (Leal Filho et al, 2019).

Regarding the social/cultural dimension, the indicator called "Social Inclusion of Collectors" complies with the provisions of Solid Waste National Policy (Art. 10, Federal Law N$^{o}$ 12,305, of August 2, 2010) and Solid Waste State Policy (State Law N$^{o}$ 16,032 of June 20, 2016). Both laws give the collectors the primacy in the execution of the works related to the selective collection, reuse and recycling of solid wastes collected by the municipality. The local government, as responsible for the execution of sanitation services, including solid waste management, should promote actions that integrate collectors into shared responsibility for the product life cycle. So, it is up to the municipalities observe all criteria of Solid Waste National Policy, which establishes the need to encourage the creation and development of cooperatives or other ways of collectors' association.

Regarding institutional dimension, the indicator "Environmental Structure" allows the institutional necessary arrangement for the implementation of local environmental management. The municipality needs to establish its municipal environment system, according to the Environmental National Policy (Federal Law N$^{o}$ 6,938, dated August 31, 1981) and Complementary Law N$^{o}$ 140, of December 8, 2011. According to Complementary Law N$^{o}$ 140/2011, this regulated Art. 23 of the Federal Constitution, municipalities must execute and enforce, at the municipal level, the National and State Environmental Policies and other national and state policies related to the protection of the environment. Local governments must exercise control and oversee the activities and projects whose attribution for licensing or authorizing is attributed to the municipality.

Moreover, about institutional dimension, the indicator "Comdemas Effectiveness" represents the installed capacity of social participation in local environmental management. The Municipal Council of Environment (CMMA or COMDEMA) must be established by municipal law; must have equal participation (organized civil society and public power) in the execution of environmental policy; should be consultative and deliberative (and may be recursive); should establish standards of prevention, control and monitoring of the environment; should be able to propose plans, projects, programs and actions for the protection, conservation and sustainable use of environmental resources; its ordinary and extraordinary sessions must be regular and uninterrupted, ensuring the operation and continuity of the council over the years; must have internal rules, approved by Municipal Decree, which establishes the competencies of the collegiate, composition, organization and the competencies of the Presidency, the Executive Secretariat and the Directors. This indicator is very important for the PSMV, since it is the only compulsory criterion for the inscription of municipalities in the certification program. Furthermore, the SDGs into a local level require active participation of citizens (GallI et al, 2018).

**Conclusion**

The Seal Municipality Green Program - PSMV has four dimensions of sustainability, which support 16 environmental indicators from five thematic axes, allowing the evaluation of the urban management effects on the environment. Environmental indicators are correlated with the legal requirements of national and state policies, which promote the protection of environmental resources. The PSMV evaluation is focused on achieving sustainability in the local territory, which minimize the social and environmental costs of negative externalities. The environmental indicators incorporate ecological prudence, economic viability and social equity in territorial management. The environmental certification of the State of Ceará/Brazil represents, therefore, an important strategy in the search for sustainable cities.

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