

**Climate Change and Environmental Education: a PlanClima SP 2020-2050  
analysis**

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## ABSTRACT

This article sought to analyze the Climate Action Plan for the City of São Paulo 2020-2050 (PlanClima SP), published in June 2021, in dialogue with the documents: Curriculum of the City of Natural Sciences and 2030 Agenda. In a critical perspective of Environmental Education, the PlanClima SP establishes some actions towards zero carbon in 2050. In this sense, the objective of the study was to analyze the potentialities presented in the document for the development of sustainable pedagogical practices. The methodology selected for this study was qualitative, carried out with the analysis of the cited documents based on the concept of the Critical Environmental Education. The results found demonstrate practical possibilities for actions aimed at training critical and reflective students for a sustainable development. The Environmental Education actions proposed in the analyzed material point to the modification and construction of behaviors and attitudes aimed at the culture of environmental preservation. It is concluded that the discussion about carbon emissions in a critical and conscious way, through pedagogical practices, is powerful in environmental preservation and sustainability.

**KEYWORDS:** Critical Environmental Education. Carbon Emission. Curriculum.

## Introduction

The school context presents itself as one of the paths in the climate discussion, with Environmental Education being necessary in the educational routine of public schools. Published in 2019, the Curriculum of the City of Natural Sciences guides the contents necessary for the construction of learning for students who are the target audience of Elementary School, in the territory of the city of São Paulo, Brazil. The document established by the Municipal Department of Education (*Secretaria Municipal da Educação – SME*) presents the Knowledge Matrix and is based, among others, on ethical, political and aesthetic principles.

Ethical Principles: justice, solidarity, freedom and autonomy; respect for the dignity of the human person and commitment to promoting the good of all, contributing to combat and eliminate any manifestations of prejudice and discrimination;

Political Principles: recognition of citizenship rights and duties, respect for the common good and preservation of the democratic regime and environmental resources; of seeking equity in access to education, health, work, cultural goods and other benefits of demand for a diversity of treatment to ensure equal rights among babies, children, adolescents and adults who have different needs to reduce poverty and social and regional inequalities;

Aesthetic Principles: cultivating sensitivity together with rationality; to enrich the forms of expression and the exercise of creativity; of valuing different cultural manifestations, especially those of Brazilian culture; of construction of plural and solidary identities (SÃO PAULO, 2019a, p. 28-29).

The Curriculum of the City of Natural Sciences presents as a premise the development of learning by students in a critical, creative and technological perspective. In this way, the guiding document of the municipality's pedagogical practices enables those involved in the educational process "[...] to reflect on the consumer appeals of contemporary society, the risks of environmental devastation and naturalization of social, human, affective and emotional problems" (SÃO PAULO, 2019a, p. 16).

Pervading the idea of a static curriculum, the guiding document for Elementary Education in the municipality presents a series of opportunities for students to “[...] analyze, question and apply scientific knowledge in order to intervene and improve individual quality of life, collective and socio-environmental, in addition to respecting ethical principles” (SÃO PAULO, 2019a, p. 63).

The practice referred to in the curriculum, however, is a very well established prior reality through didactic, political, administrative, economic, etc. behaviors, behind which many assumptions, partial theories, rationality schemes, values and beliefs are hidden, etc., which condition the theorizing about the curriculum. Some initial prudence is necessary in the face of any naive placement of a pedagogical nature that presents itself as capable of governing curriculum practice or, simply, of rationalizing it (SACRISTÁN, 2000, p. 13).

The selection of the theme for this research is justified by the need to understand how, how to do it, that is, the strategies that the city of São Paulo will use to meet the target established, so that, by 2050, it reaches zero emissions of Gases from the Greenhouse effect.

The objective of this research is to investigate how municipal schools in the city of São Paulo, in dialogue with the curriculum, can develop practices for the neutralization of Greenhouse Gas (GHG) emissions by 2050. In this sense, it is presented as a guiding question: How will the school support the actions proposed by the PlanClima SP?

Environmental Education is presented at school as a transdisciplinary theme<sup>1</sup>, being powerful in the identification of socio-environmental vulnerabilities and in the acquisition of knowledge for sustainable development, including the effects of climate change. Reigota (2010) states that natural and social elements interact in a dialogical way with Environmental Education, as they are intrinsically linked to social, political and cultural aspects. “This is an education that aims not only at the rational use of natural resources (just to mention this example), but basically the participation of citizens in discussions and decisions on the environmental issue [...]” (REIGOTA, 2010, p. 11).

Freire (1996) deals with the curious subjectivity that, based on critical reflection on socio-historical and political issues, is re-signified and capable of leading the individuals to understand their role in the world, “[...] it is not just that of who sees what happens but also who intervenes as the subject of occurrences [...]” (FREIRE, 1996, p. 85).

I am not only the object of History but its subject as well. In the world of History, culture, politics, I see it not to adapt it but to change it. In the physical world, my realization does not lead to impotence. Knowledge about earthquakes has developed an entire engineering that helps us survive them. We can't eliminate them but we can reduce the damage they cause us (FREIRE, 1996, p. 85-86).

Based on Freire's thinking, identifying a problem situation and intervening in the search for solutions makes individuals “[...] capable of intervening in reality, a task incomparably

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<sup>1</sup> Themes worked in all areas of knowledge.

complex and generating new knowledge rather than simply adapting ourselves to it [...]” (FREIRE, 1996, p. 86). The knowledge of socio-environmental problems, their finding, requires a change in educational paradigms for intervention in reality. “It is from this fundamental knowledge: change is difficult but it is possible, that we will program our political-pedagogical action, no matter what project we are committed to [...]” (FREIRE, 1996, p. 88).

According to Leff (2009), environmental knowledge involves social, ethical and cultural issues, so environmental rationality is premised on the critique of the economy and the way in which global economic development disregards environmental impacts and their consequences on global warming.

Environmental rationality opens the way for a re-eroticization of the world, transgressing the established order, which imposes the prohibition of being. Environmental knowledge, interrupted by the incompleteness of being, perverted by the power of knowledge and mobilized by the relationship with the Other, elaborates categories to apprehend the real from the limits of existence and understanding, difference and otherness. In this way, it creates worlds of life, builds new realities and opens the course of history to a sustainable future (LEFF, 2009, p. 2).

It is inferred, therefore, that local action for sustainable development is pedagogical and, based on social, ethical and cultural issues, is potentially capable of giving new meanings to practices and expanding knowledge. “[...] environmental knowledge changes the look of knowledge and with it transforms the conditions of knowledge in the world in the relationship that establishes the being with the thinking and knowing, with the knowing and acting in the world [...]” (LEFF, 2009, p. 2).

When considering the environmental knowledge in the mitigation of GHG emissions in São Paulo until 2050, it becomes a challenge for education to carry out the task of promoting practices in Environmental Education that corroborate the construction of a new reality for sustainable development. “[...] environmental education is the dialogic process that fertilizes the real and opens up the possibilities for becoming what one is not yet.” (LEFF, 2009, p. 8).

According to Artaxo (2011), climate change and reduced rainfall in all regions of Brazil have irreparable socioeconomic impacts. The author states that temperature tends to increase significantly, interfering with global dynamics if there is no reduction in the burning of fossil fuels and the burning of forests. Therefore, anthropogenic actions<sup>2</sup> in GHG emissions are irreversible.

Alisson (2021) reveals that the Intergovernmental Panel on Climate Change (IPCC) report states that “[...] if immediate, large-scale and sustained reductions in CO<sub>2</sub> and other greenhouse gas emissions are not made, the chance of the level of global warming reaching or exceeding 1.5 °C in the current decade is high [...]” (ALISSON, 2021, p. 2). In this sense, the IPCC lists “[...] the pollution of the urban air and global climate change [...]” (ALISSON, 2021, p. 2).

A small reading of the international literature produced on this topic also serves as a key to understanding the role that climate adaptation plans can play when carried out in local contexts, similar to the one evaluated here. The experience of the city of Barcelona, Spain, in

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<sup>2</sup> Actions that result from human action.

the production of a climate plan in which social actors also used a digital platform to indicate the points to be listed in the preparation of the plan, was reported in Satorras et al. (2020). The authors' conclusion is that this type of co-production makes possible greater interaction and participation of other actors, in addition to those involved in non-governmental organizations aimed at promoting sustainable environments, bringing a diversity of views to a work that, in turn, can portray the greatest plurality of opinions in the locality (SATORRAS et al., 2020).

The work of Adolfsson, Lindbcad and Peacock (2021) addresses another perspective when the authors analyze three climate adaptation plans for northern European cities (Bordeaux, France; Gothenburg, Sweden; and Cambridge, England) and the permanence of the concept of sustainability and its different uses. Sustainability, in the plans analyzed in this article, includes an elasticity of functions, meanings and actions in favor of improvements in the environment, which allow a sample of how the term offers insights, how the different manifestations of this concept are influenced by external and internal attitudes and, mainly, as the concept remains on the agenda and is constantly reused in dialogue with other ideas, remaining relevant in these times.

A third sample, also current and in line with the debate held here, is the article produced by Fiack et al. (2021), in which the authors assess 22 climate adaptation plans of the 100 largest North American cities, aiming to find aspects that go beyond the mere adoption of environmental laws, that is, plans that integrate social equity actions (FIACK et al., 2021). Again, the concept of sustainability permeates the analysis and presents another meaning of its use: that of fair sustainability, which encompasses, in addition to environmental issues, concerns with economic development and social vulnerability, issues that, if not included in climate adaptation plans, can lead to the failure of initiatives that are tied only to actions to mitigate environmental impacts. It is worth mentioning here an excerpt from the conclusion of this work that points directly to the value that the breadth of themes covered in a climate adaptation plan can bring to a location:

In the long-term, assessments of adaptation plan implementation that focus on the distribution of climate adaptation outcomes and the prioritization of adaptation objectives will help to shed light on whether efforts to integrate social equity concerns into climate adaptation planning are merely symbolic gestures or translate into substantive improvements in distributive justice for present and future generations. (FIACK et al., 2021, p. 9).

Therefore, PlanClima SP (2021) seeks to approach the various plans presented internationally, with the objective of developing actions to neutralize greenhouse gas emissions in the city of São Paulo by 2050.

### **Methodology**

To answer the question that guides this work, document analysis was used as a methodological procedure, based on the content analysis (BARDIN, 2011). The search was carried out on the portal of the city of São Paulo, through which two documents were located:

the Climate Action Plan for the City of São Paulo 2020-2050 (PlanClima SP) and the Curriculum of the City of Natural Sciences. Ordinance no. 509, of September 24, 2019 (SÃO PAULO, 2019b), and 2030 Agenda, located in the 2030 Agenda Platform, were also analyzed. Table 1 below shows the documents and their contributions to this study.

Table 1 – Document analysis

Document	Analysis
<b>Climate Action Plan for the City of São Paulo 2020-2050 (PlanClima SP)</b>	Strategic document that establishes a set of actions for the city of São Paulo to meet the commitment assumed under the Paris Agreement.
<b>Curriculum of the City of Natural Sciences</b>	Guiding document for pedagogical actions organized by Knowledge Areas and Curriculum Components, which groups objects of knowledge and learning and development objectives.
<b>Ordinance no. 509/2019</b>	Creates the Intersecretarial Working Group ( <i>Grupo de Trabalho Intersecretarial – GTI</i> ) with the purpose of preparing the Climate Action Plan in partnership with the international network of cities called C40.
<b>2030 Agenda</b>	Global Action Plan composed of 17 Sustainable Development Goals, the SDGs, and 169 goals, to eradicate poverty and promote a decent life for all, within the limits of the planet.
<b>Normative Instruction no. 45/2020 of the Municipal Department of Education</b>	Defines educational guidelines for the implementation of Environmental Education within the Municipal Education Network.

Source: Elaborated by the authors, 2021.

It is noteworthy that the document analysis proposed in this study aims to verify its importance from the concepts of Critical Environmental Education, as well as the direct or indirect relationship to the implementation of actions for climate change in school based on the studied documents.

## Results

PlanClima SP (2021), created from the Mayor's Ordinance (*Portaria do Prefeito*) no. 509, of September 24, 2019 (SÃO PAULO, 2019b), is a strategic document that establishes a set of actions for the city of São Paulo to meet the commitment assumed in the Paris Agreement<sup>3</sup>.

This Climate Action Plan for the City of São Paulo (PlanClima SP) aims to guide the action of the municipal government to include the climate variable in its decision-making process. In other words, government decisions need to consider that the climate is changing and this variation imposes changes in the available knowledge and in the practices implemented by the City of São Paulo [...]. (SÃO PAULO, 2021, p. 14).

<sup>3</sup> The Paris Agreement is a global treaty that aims to reduce global warming. It was discussed among 195 countries during the 21st United Nations Conference of the Parties (COP 21) in Paris. The international commitment was approved on December 12, 2015 and entered into force on November 4, 2016.

The Intersecretarial Working Group (GTI)<sup>4</sup>, established in 2019, through the Mayor’s Ordinance no. 509, presents itself as responsible for making the PlanClima SP (2021) viable and, among the objectives of the document, “[...] also intends to encourage society to reflect on the impact of climate change on its activities, in order to be prepared for the transformations to come” (SÃO PAULO, 2021, p. 14). Even though PlanClima SP (2021) is a pioneering initiative, in the way it was conceived, other initiatives that preceded it were subsidies for the proposal to be developed until 2050. In Table 2 below, some previous initiatives for climate issues are presented.

**Table 2 – Brief history of São Paulo’s Climate Plans**

Year	Plans
2005	São Paulo Greenhouse Gas Emission Inventory.
2009	Climate Change Policy (Municipal Law no. 14933). 2nd Inventory of Greenhouse Gas Emissions.
2011	Guidelines for the Action Plan of the City of São Paulo for Mitigation and Adaptation to Climate Change.
2012	SP Plan 2040 – The City We Want.
2014	Strategic Master Plan ( <i>Plano Diretor Estratégico</i> – PDE) proposes the creation of Payment for Environmental Services.
2015	2030 Agenda for Sustainable Development.
2016	Mayor’s Challenge Award, for the implementation of the <i>Ligando os pontos</i> Project. New Urban Agenda - United Nations Conference on Human Settlements.
2018	The City Hall signed the Term 2020 Commitment. Expansion of composting yards. Preparation of greenhouse gas emissions inventories for the period 2010/2017.
2019	Launch of the Climate Action Plan as a goal of the Targets Program. 1st meeting of the Steering Committee of the Program of the Fleet Replacement by Cleaner Alternatives (COMFROTA).

Source: Elaborated by the authors, 2021.

The main objective of PlanClima SP (2021) is to adopt measures to make the city carbon neutral by 2050, considering: 1. Emission mitigation, delivering an emission-free city by 2050; 2. Adaptation to climate impacts, with actions in a decision-making process that incorporate them in the near future; 3. Equity, with the equal distribution of these benefits to the entire population.

From the general objectives of PlanClima SP (2021), at first, the necessary political action undertaking is established for the reduction by 2030 of 50% of the emissions of greenhouse gases, in the city of São Paulo, compared to the levels of 2017, which are:

Unconditional target: By 2030, the city of São Paulo should reduce its greenhouse gas emissions by 20% compared to the base year 2017.

<sup>4</sup> Composition: International Relations Coordination; Secretariats: Municipal Government; Green and the Environment; Licensing; Urban Infrastructure and Works; Urban Development; Housing; of the Subprefectures; Economic Development and Labor; Health; Municipal Assistance and Social Development; Urban Security; General Comptroller of the Municipality; Municipal Urban Cleaning Authority; Emergency Management Center; Traffic Engineering Company; São Paulo Transport; *São Paulo Obras*, São Paulo Urbanism; and Metropolitan Housing Company of São Paulo.

Conditional target: By 2030, the city of São Paulo will reduce its greenhouse gas emissions by 50% compared to the 2017 base year, if actions involving decarbonization that are not under the control of the city of São Paulo are carried out. Conditional target: By 2050, the city of São Paulo will reduce its net emissions of greenhouse gases to zero, if actions involving decarbonization and which are not under the control of the city of São Paulo are carried out (SÃO PAULO, 2021, p. 16).

In a second moment, the plan aims to “[...] implement the necessary measures to strengthen the resilience of the City, reducing the social, economic and environmental vulnerabilities of the São Paulo population and increasing their adaptability [...]” (SÃO PAULO, 2021, p. 16).

PlanClima SP (2021) is structured into five strategies to achieve its goals, which are iconically identified as shown in Figure 1.

Figure 1 - Strategies of PlanClima SP (2021)



Source: Adapted by the authors from PlanClima SP (SÃO PAULO, 2021, p. 16, our translation).

The strategies present the specific mitigation and adaptation objectives present in the 44 actions of the PlanClima SP (2021).

Each of the actions define specific goals in its execution. As the purpose of this research is the understanding of how the school will support the proposed actions, it is identified in the PlanClima SP (2021) that the bet on the knowledge of Critical Environmental Education is potentially positive for changing values, behaviors, feelings and attitudes .

The transformation of the consumer society to a sustainable society, that is, equitable and ecologically balanced, demands a continuous training process:

The Universidade Aberta do Meio Ambiente e Cultura de Paz (UMAPaz) [Open University for the Environment and Culture of Peace], of the Green and Environment Secretariat, has been operating since 2005 in the management of PMEAs and has as its purpose the dissemination of socio-environmental education through the



provision of activities and courses in environmental improvement and in the culture of peace in the city, fostering the creation of social and environmental participation networks (SÃO PAULO, 2021, p. 260).

According to PlanClima SP (2021), UMAPaz, in partnership with the Environmental Education Center (*Núcleo de Educação Ambiental – NEA*), of the Municipal Department of Education, constitutes training and multiplier spheres of socio-environmental issues. The Curriculum of the City proposes to the educators of the educational units a reflection on the development of pedagogical projects based on the contents of environmental education.

The environmental education promoted by UMAPaz incorporates the approach to climate change in the various developed themes. Projects may originate from demands, but fundamentally derive from diagnoses that direct and give meaning to strategic planning for transformation and desirable changes in society (SÃO PAULO, 2021, p. 260).

The Normative Instruction no. 45/2020 of the Municipal Department of Education (IN SME no. 45/2020) presents, in its text, guidelines for the implementation of Environmental Education in SME schools. It is inferred, therefore, that the cited publication is developed in municipal public education.

PlanClima SP (2021) suggests the construction of sustainable schools as one of the actions to be implemented to reduce gas emissions. According to Article 3 of IN SME no. 45/2020, the methodological paths defined for the construction of a sustainable school should have as objective some actions aimed, above all, to:

- I - socio-environmental mapping: developing potential for the Educational Unit to become a Sustainable School.
- II - create Environmental Commission: an environmental collegiate consisting of different actors from the school community and/or the surroundings.
- III - planning: definition of the Educational Unit's Environmental Education project, with a view to aligning the actions that the school is already developing towards sustainability with what needs to be improved and what needs to be implemented.
- IV - monitoring the actions necessary for the project to be feasible.
- V - organization of results and product: ways of measuring the results and product to be presented.
- VI - educommunication: publicize and present the paths of a Sustainable School.
- VII - continuing education: participation and involvement (SÃO PAULO, 2020, p. 1).

Therefore, it is understood that, from the methodological path defined by IN SME no. 45/2020, through the City Curriculum, the actions developed by the school units will contemplate the Sustainable Development Objectives (SDGs). PlanClima SP (2021), through actions established until 2050, institutionalizes the initiatives previously adopted by UMAPaz, the Municipal Department of Education, Regional Education Boards (*Diretorias Regionais de*

Ensino – DRE) and Environmental Education Center (NEA), as well as enhancing the concept of the practice of a Critical Environmental Education for the sustainable development.

To the Race to zero carbon by 2050, PlanClima SP (2021) presents the five guidelines for climate action so that the goals and actions correspond to the objectives specified by the municipal public administration, namely:

1. Integrated approach: identify actions that respond both to reducing climate risks and reducing greenhouse gas emissions, so as to use public resources efficiently.
2. Prioritize and strengthen existing actions: start implementation with actions that are already provided for in sector plans, programs and projects, inserting and improving their climate and inclusive potential.
3. Adopt no-regret and win-win actions: implement from now on:
  - a) actions that are worth the investment, regardless of the dimensions of climate change or whose costs are relatively low in view of the benefits; and b) measures that, while reducing climate risks, bring wider social, economic and environmental benefits.
4. Strengthening climate governance in the city: mobilizing the different actors inside and outside the City of São Paulo to implement integrated and intersectoral actions.
5. Promote metropolitan and regional mobilization: inspire and mobilize other cities in the adoption of actions to combat climate change (SÃO PAULO, 2021, p. 17).

For example, Action 16 stands out, which establishes the maximization of composting processes, which “[...] aims to increase the amount of organic waste treated by composting processes, preceding biodigestion whenever possible[...].” (SÃO PAULO, 2021, p. 174). The plan provides as a fundamental activity “[...] to implement composting in 100% of schools in the municipal education network by 2025” (SÃO PAULO, 2021, p. 174). It also defines that the compost produced “[...] may be destined for actions involving the planting and maintenance of public green areas” (SÃO PAULO, 2021, p. 174).

The actions proposed in PlanClima SP (2021) were based on municipal public policies already developed by the SME. According to the aforementioned document, in the educational sphere, by the Municipal Department of Education, the Municipal Secretariat for Green and Environment (*Secretaria Municipal do Verde e Meio Ambiente – SVMA*) and UMAPaz, since 2019, have been promoting continuous training for public school teachers, expanding information and knowledge on environmental sustainability.

According to PlanClima SP (2021), a commitment was made to promote training, prioritizing issues related to

climate change, conscious consumption and pedagogical practices, based on the concept of sustainability. This commitment provides for the formation of a working group with the United Nations Educational, Scientific and Cultural Organization (Unesco) to plan and implement actions that address topics such as culture of peace, human rights and non-violent communication (SÃO PAULO, 2021, p. 260).

According to the documentation analyzed in this research, initiatives around small powerful measures to corroborate climate issues were already underway in education. In Table 3 below some of the projects under development that can be expanded after the publication of PlanClima SP (2021) are described.

**Table 3 – Environmental Education Projects**

Project	Proposal
<b>Sustainable Schools</b>	Intersectorial commitment in promoting mainly the continuing education of teachers.
<b>Composting in Schools</b>	Partnership with the Municipal Urban Cleaning Authority (Amlurb), whose objective is to sensitize students to issues related to consumption, generation and proper disposal of waste in accordance with the National Solid Waste Policy.
<b>Socioenvironmental Educommunication</b>	Purpose of encouraging children’s participation and protagonism, inclusion, creativity, critical reading, experimentation and commitment to collaborative forms of production and sharing of knowledge.

Source: Elaborated by the authors, 2021.

In dialogue with the Curriculum of the City of Natural Sciences, it is inferred that the actions proposed in PlanClima SP (2021) converge with the concept of education established by the Municipal Department of Education. The idea of sustainability proposed in the Curriculum of the City “[...] reinforces a feeling of co-responsibility and the constitution of ethical values, allowing students to discuss the availability of natural resources and their conscientious use [...]” (SÃO PAULO, 2019a, p .79).

The Sustainable Schools, Composting in Schools and Socioenvironmental Educommunication projects reaffirm the goals to be achieved in the development of Environmental Education in the school environment, as well as enabling students, teachers and the community to understand the environmental impact from the relationship between production and consumption. The development of dialogic practices enable subjects to critically position themselves in relation to climate issues.

Pressing themes such as human rights, environment, social and regional inequalities, cultural and religious intolerance, abuses of power, excluded populations, technological advances and their impact, politics, economy, financial education, consumption and sustainability, among others, need to be debated and faced, in order to make humanity advance [...] (SÃO PAULO, 2019a, p. 35).

The Curriculum of the City is a document that dialogues with today’s social demands, the active participation of students points to sustainable transformation, whether this is a change in local or global reality. It is understood as a challenge to integrate the demands of society to an innovative educational proposal, in an emancipatory curriculum concept.

By integrating the SDGs, present in the 2030 Agenda, municipal public schools have already included in their projects some of the themes that will be developed by PlanClima SP (2021). The SDGs, by articulating the learning objectives and guidelines for climate action, point to inspiring themes to be worked on that will contribute to zero carbon in 2050. Even though the PlanClima SP (2021) has not been classified as an environmental plan, “[...] it is the beginning

of a profound transformation of the activities of the municipal public administration, inserting the response to climate change in all its sectorial activities and policies [...]” (SÃO PAULO, 2021, p. 17).

### Conclusion

From the analysis of the documents that establish the guidelines for the development of pedagogical practices in Environmental Education to reduce the emission of greenhouse gases, it is evident that the greatest challenge for the municipal public school will be to implement the practices and monitor them within a methodological rigor, in order to actually achieve the expected result. Another issue to be considered for the implementation of sustainable pedagogical practices to reduce gas emissions is to bring the concept of Critical Environmental Education closer to the curriculum experienced in everyday school life.

In summary, it is considered that the findings indicate that the guidelines for the development of practices that support zero emissions in 2050 are important contributions that will guide the reflections and actions to rethink the Environmental Education practiced in schools, contributing to the development of a school and a more ethical society, anchored in broader concepts of sustainability, such as those demonstrated throughout this text.

Based on the results, the need for continuous training of all teachers involved in the development of PlanClima SP actions (2021) is highlighted. According to the analyzed records, the training promoted by the UMAPaz, the Municipal Department of Education, the Regional Education Boards and the Environmental Education Center (NEA) is still restricted, as it is necessary to serve a larger number of teachers so that they can build knowledge around environmental emergencies, expanding their perception for the transformation of a sustainable society.

From this work, it is inferred that the effective participation of schools in the search for solutions to reduce carbon emissions by 2050 will only be a reality when all actors involved in the process understand that education for sustainability presupposes a change based on knowledge, new values and new attitudes towards environmental preservation.

### BIBLIOGRAPHICAL REFERENCES

ADOLFSSON, Petra; LINDBLAD, Jenny; PEACOCK, Sophia. Translations of sustainability in urban planning documents - A longitudinal study of comprehensive plans in three European cities. *Cities*, [s. l.], v. 119, 103360, p. 1-10, 2021.

DOI: <https://doi.org/10.1016/j.cities.2021.103360>

ALISSON, Elton Mudanças climáticas já afetam todas as regiões do planeta, afirma IPC. **Agência FAPESP**, 10 ago 2021. Available at: <https://agencia.fapesp.br/mudancas-climaticas-ja-afetam-todas-as-regioes-do-planeta-afirma-ipcc/36533/>. Access on: Sept. 3, 2021.

ARTAXO, Paulo. Prólogo: Riscos e desafios: O aquecimento global não é o fim. In: TASSARA, Eda Terezinha de Oliveira; RUTKOWSKI, Emília Wanda. (org.). **Mudanças climáticas e mudanças socioambientais globais: reflexões sobre alternativas de futuro**. São Paulo: UNESCO/IBICC, 2011. p. 11-13.

BARDIN, Laurence. **Análise de conteúdo**. São Paulo: Edições 70, 2011.

FIACK, Duran; CUMBERBATCH, Jeremy; SUTHERLAND, Michael; ZERPHEY, Nadine. Sustainable adaptation: Social equity and local climate adaptation planning in U.S. cities. *Cities*, [s. l.], v. 115, 103235, p. 1-11, 2021. DOI: <https://doi.org/10.1016/j.cities.2021.103235>

FREIRE, Paulo. **Pedagogia da Autonomia**: saberes necessários á prática educativa. São Paulo: Paz e Terra, 1996.

LEFF, E. Complexidade, Racionalidade Ambiental e Diálogo de Saberes. **Educação & Realidade**, Porto Alegre, v. 34, n. 3, p. 17-24, 2009. Available at: <https://seer.ufrgs.br/educacaoerealidade/article/view/9515/6720>. Access on: Sept. 3, 2021.

REIGOTA, Marcos. **Meio ambiente e representação social**. São Paulo: Cortez, 2010.

SACRISTÁN, Jose Gimeno. **O currículo**: uma reflexão sobre a prática. Porto Alegre: Artmed, 2000.

SÃO PAULO. **Plano de Ação Climática do Município de São Paulo 2020-2050**. 2021. Available at: [https://www.prefeitura.sp.gov.br/cidade/secretarias/upload/meio\\_ambiente/arquivos/PlanClimaSP\\_BaixaResolucao.pdf](https://www.prefeitura.sp.gov.br/cidade/secretarias/upload/meio_ambiente/arquivos/PlanClimaSP_BaixaResolucao.pdf). Access on: August 8, 2021.

SÃO PAULO (Cidade). Secretaria Municipal de Educação. Coordenadoria Pedagógica. **Currículo da cidade**: Ensino Fundamental: componente curricular: Ciências da Natureza. 2.ed. São Paulo: SME / COPED, 2019a.

SÃO PAULO (Cidade). **Portaria Nº 509, de 24 de setembro de 2019**. Cria o Grupo de Trabalho Intersecretarial (GTI) com a finalidade de elaborar o Plano de Ação Climática em parceria com a rede internacional de cidades denominada C40. São Paulo: Legislação Municipal, [2019b]. Available at: <http://legislacao.prefeitura.sp.gov.br/leis/portaria-prefeito-pref-509-de-24-de-setembro-de-2019>. Access on: August 12, 2021.

SÃO PAULO (Cidade). **Instrução Normativa Secretaria Municipal da Educação nº 45 de 20 de novembro de 2020**. Define diretrizes educacionais para a implementação da Educação Ambiental no âmbito da Rede Municipal de Ensino. Available at: <https://legislacao.prefeitura.sp.gov.br/leis/instrucao-normativa-secretaria-municipal-de-educacao-sme-45-de-30-de-novembro-de-2020/detalhe>. Access on: August 13, 2021.

SATORRAS, Mar; RUIZ-MALLÉN, Isabel; MONTERDE, Arnau; MARCH, Hug. **Co-production of urban climate planning**: Insights from the Barcelona Climate Plan. **Cities**, [s. l.], v. 106, 102887, p. 1-11, 2020. DOI: <https://doi.org/10.1016/j.cities.2020.102887>